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From the Desk of Editor-in-Chief

We are delighted to inform that the 8th issue of the Dhaka Central International Medical College Journal (DCIMCJ) is going to be published very soon. We are grateful to Almighty Allah. We are sending the complimentary copies of the journal to the libraries of most of the medical college and other medical institutions in Bangladesh. Already our journal has been approved by Bangladesh Medical & Dental Council (BMDC). We invite the doctors of medical colleges and institutes to submit their research articles to the journal committee for publication. We accept both hard & soft copies of the articles. We go through the papers and if necessary, communicate the authors. We also thank all the authors for giving us opportunity to publish their research papers in this journal. We have tried our best to avoid erroneous information. We like to add here that DCIMC Journal and its editorial board accept no liability for any inaccurate and misleading information, opinion and statements. It is the responsibility of the individual author (s). We have mentioned the instruction for the authors in this issue. We request the contributing authors to follow the instructions for their manuscripts. We appreciate our chairman, editors, members and advisors for their encouragement and also appreciate the contributors and reviewers for their participation. Last of all we welcome valuable suggestion, opinion, advice and constructive criticisms for improvement of the quality of the journal.

Prof. Md Azizul Islam
Editor-in- Chief

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Five types of manuscripts may be submitted:

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I. A. Preparing manuscript for submission to DCIMCJ Editors and reviewers spend many hours

reading manuscripts that are easy to read and edit. Much of the information in this journal`s Instructions to Authors is designed to accomplish that goal in ways that meet each journal`s particular editorial needs. The following information provides guidance in preparing manuscripts for this journal.

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   - Title page
   - Summary/abstract
   - Text
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- Double-spacing all portions of the manuscript- including the title page, abstract, text, acknowledgments, references, individual tables, and legends- and generous margins make it possible for editors and reviewers to edit the text

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Research reports frequently omit important information. Reporting guidelines have been developed for a number of study designs that DCIMC journals ask authors to follow. Authors should consult the information for Authors of this journal. The general requirements listed in the next section relate to reporting essential elements for all study designs. Authors are encouraged also to consult reporting guidelines relevant to their specific research design. A good source of reporting guidelines in the EQUATOR network (http: //www.equator-network.org/home/) or CONSORT network (http://www.consort-statement. org).

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  - Acknowledge any person or institute who have helped for the study
- **Reference**
  - Abide by the Vancouver style
  - Use reference at the end of the sentence after the full stop with superscript
- **Legends**
  - Table
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The editor reserves the right to style and if necessary, shorten the material accepted for publication and to determine the priority and time of publication

Editorial

Kidney Transplantation (KT) – Current Management and Outcome

Nomany BMS[1], Chowdhury MAH[2]

Introduction:

Among all the modalities of renal replacement therapy in end stage renal disease (ESRD), kidney transplantation (KT) is the treatment of choice. The transplanted kidney provides adequate renal support, corrects uremia and also endocrine dysfunction due to ESRD. However the KT is not free of risks due to the major surgical procedure and subsequent lifelong immune suppression. However suitability for KT has no set criteria, rather it depends on the recipient's comorbid condition, quality of life after transplantation and the patient's wishes.

Benefits of transplantation:

1. Improved patient survival:

It is not fair to compare between the survival of dialysis patients and the survival of KT patients. Because many dialysis patients are elderly having comorbidities and not fit for transplantation.

However, if patient's survival after KT is compared to transplant-listed dialysis patients, there remains a significant survival advantage, after overcoming the initial risk of surgery. This is mainly due to a reduction in cardiovascular morbidity and mortality.

2. Improved quality of life (QOL):

- Freedom from the time commitment and attachment with dialysis centre.
- Freedom from the both dietary and fluid restrictions.
- Improved overall sense of well-being.
- Improved exercise capacity.
- Improved quality of life for family members.

1. **Dr. Bakhtiare Mohammad Shoeb Nomany**
Associate Professor, Department of Medicine,
Dhaka Central International Medical College.

2. **Dr. Md. Abdul Hye Chowdhury**
Associate Professor, Department of Surgery,
Dhaka Central International Medical College.

3. More physiological and ideal correction of the uraemia, anaemia, restless leg syndrome and CKD related mineral and bone disorders.

4. More physiological and ideal correction of thyroid, parathyroid, prolactin and sex hormones resulting in improved sexual function and fertility,that may lead to successful pregnancy in female.

5. Better for the health economics: Total expenditure is less in kidney transplantation than dialysis (after the first year of KT).

Outcomes of Renal Transplantation: Some key facts

The cumulative data from almost all studies show that transplantation of a living donor kidney provides better outcomes than deceased donation. The precise reason for this is many factors including the ability to perform preemptive transplants with living donors. A long-term analysis performed by ANZDATA shows there was a 10% advantage to living donation at 1 year and 14% advantage by 20 years after transplantation (Table 1)[1].

Graft survival after living and deceased donor Kidney transplantation (KT)

Years	1	5	10	15	20
Living donor	91	75	61	45	35
Deceased donor	81	66	47	33	21

Table 1: Graft survival after living and deceased donor trans-plantation. Percentage of actuarial non–death-censored graft survival after living and deceased donor transplantation, 1985 to 1989[2].

Half-Life Analysis:

The half-life analysis is used to extrapolate results beyond where the data stop. There are two different half-life calculations in the literature: the median survival, which is the time for which the middle patient in the series has survived; and the conditioned half-life, which is the median survival of the patients who have survived 1 year or more. Figure 1 provides an example of the use of half-life calculations to demonstrate the difference in outcomes related to human leukocyte antigen (HLA) matching between donor and recipient.[3]

Graft survival by half-life analysis

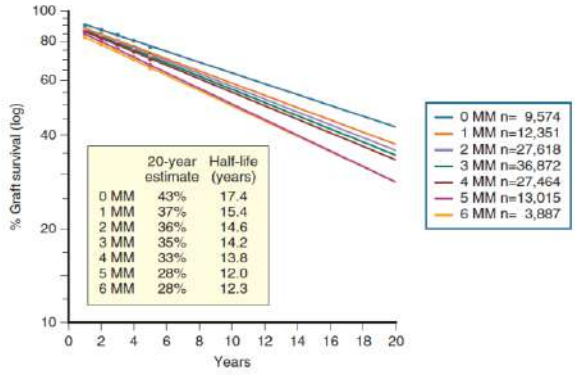


Figure 1: Graft survival by half-life analysis. Collaborative Transplant Study analysis of survival of first deceased donor renal transplants performed from 1985 to 2011 by human leukocyte antigen (HLA) mismatch (MM) showing the half-life calculation and 20-year estimates of survival. [4]

Immunosuppression for KT:

Much of the success of kidney transplantation is a result of advances in immunosuppressive medications that are used during the induction and maintenance phases and for treatment of acute rejection.[5]

Induction therapy

It is the initial period of intense immune suppression, given at the time of KT, to reduce the incidence of early acute rejection.

It has two components:

1. Higher initial doses of agents that will subsequently be used for maintenance, e.g. pulsed IV methyl prednisolone and high-dose oral corticosteroids and ciclosporin or tacrolimus, with higher early target therapeutic levels.
2. Induction with a 'biological' agent (antibody); this may be depleting or non-depleting antibody.
   - Depleting antibody (lymphopenia): alemtuzumab, ATG, OKT3.
   - Non-depleting antibody (No lymphopenia): basiliximab.

Antibody induction is used for >80% of transplants. In broad terms, depleting antibodies are widely used in the USA and non-depleting antibodies are more favoured in the UK and Europe. There is good evidence that antibody induction reduces the acute rejection, but the effects on long-term graft outcome are less clear.

Potential advantages of antibody induction:It

- lowers dose of medicine for maintenance immune suppression (esp. steroids),
- Assists recovery from delayed graft function (DGF),
- facilitates KT with higher immunological risk of rejection.

Potential disadvantages of antibody induction:

- higher infection rates,
- greater long-term risk of malignancy.

Non-depleting antibodies:

Basiliximab

A monoclonal antibody directed against CD25 on activated T cells. Binding prevents IL-2 induced T cell proliferation and clonal expansion.

Basiliximab is a chimeric mouse-human monoclonal antibody that does not evoke an immune response. It consequently has a long half-life.

It induces relatively mild immunosuppression and is used as an induction agent to prevent rejection, not the treatment of rejection.[6,7]

Dose: 20 mg IVI on day 0 and day 4 of KT. The first infusion is usually started immediately before operation.

SE: Infusion reactions are rare.

Depleting antibodies

Alemtuzumab:

Developed in the Cambridge Pathology Laboratories (hence Campath R). Licensed for the treatment of CLL but used extensively in transplantation.

It is a humanized anti-CD52 antibody. CD52 is a highly expressed glycoprotein antigen on the surface of T and B cells (as well as thymocytes, monocytes, macrophages, and NK cells). Binding causes rapid clearing of cells from the circulation.

Profound lymphopenia persists for 6 months (B cells reconstitute before T cells).After reconstitutionof T cells there may be late rejection transplanted kidney.

Dose: 2 x 30mg doses administered by SC injection (can be IV) 24h apart (day 0 and day 1 post-transplant). Initial dose generally administered intraoperatively prior to organ reperfusion (if the patient is age >60, some centres administer only one dose).

Infusion reactions are less severe as not associated with cytokine release.

SE: anaemia, low WCC (weeks 4–8), low platelets (weeks 2–4), high infection; autoimmune phenomena, such as ITP and haemolytic anaemia, may be seen as lymphocytes reconstitute.

Immunosuppression: maintenance:

Maintenance immune suppression is given for the lifetime of the graft to prevent rejection. These agents are administered orally, and regimens usually involve several agents. Standard 'triple therapy' consists of a calcineurin inhibitor (CNI), an antimetabolite and corticosteroids.

Calcineurin inhibitors (CNI): Ciclosporin (CIC) and Tacrolimus (TAC)

This is the cornerstone of maintenance therapy over the last few decades. Ciclosporin (CIC) is a lipid-soluble peptide, derived from the fungus Tolyplacadium inflatum .Tacrolimus (TAC) is a macrolide antibiotic, isolated from the bacterium Streptomyces tsukubaensis .

CNI disrupt T cell signal 1 through binding intracytosolic immunophylins. These complexes then bind calcineurin (a protein phosphatase), preventing its interaction with substrates and reducing the transcription of T cell activation genes.Thus CNI are T cell inhibitors.

Therapeutic drug monitoring is mandatory as because-

- CNI have narrow therapeutic index (TI),
- too little drug leads to inadequate immune suppression leading to rejection,
- too much drug leads to side effects (particularly nephrotoxicity),
- there is also significant interpatient variation in drug metabolism.

Drug concentrations are measured in whole blood, as much remains bound to red blood cell or plasma protein. For cyclosporine C2 monitoring, blood should be drawn within 15 min of the 2-hours post-dose time point. For cyclosporine or tacrolimus trough-level monitoring (lowest level), blood should be drawn 12 hours after the last dose (i.e. immediately before the next dose).

Pharmacokinetics and monitoring:

After a dose of CNI, there is an initial absorptive phase, during which blood concentrations reach a peak level (*C*max). Typically, *C*max occurs during the first 2 hours after the dose and corresponds to the time of maximum calcineurin inhibition. Drug levels then fall as a result of metabolism (elimination phase)

until they are at the lowest, or trough level (*C*0) immediately before the next dose. The total drug exposure throughout the period from one dose until the next is called the area under the concentration-time curve, or in short area under curve (AUC; Fig. 2).

Drug levels during the course of a dosing interval

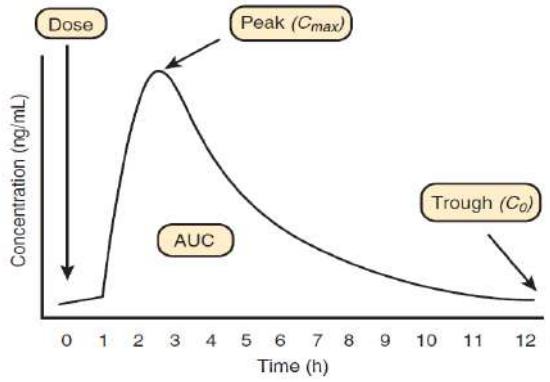


Figure 2: Drug levels during the course of a dosing interval. The drug concentration is lowest just before the dose is taken (*C*0), then rises to a peak concentration at 2 hours after the dose (*C*max). The area under the concentration-time curve (AUC) describes total drug exposure between drug administration intervals.

For both CNIs, most of the interpatient and intrapatient variability occurs in the absorption rather than in the elimination phase.

Ciclosporin:

Several generic preparations are now available. There are important differences in bioavailability between formulations, so it is crucial that the patient is consistently getting the same brand.

Dose: 2-2.5mg/kg BID per oral (PO), with subsequent adjustment, according to levels.Microemulsion formulation improve GI absorption. PO:IV conversion 3:1dose ratio.

Target ranges: There has been much interest in using 2h post-dose levels (C2 level) for therapeutic monitoring, as these provide a better estimate of drug exposure and have been associated with decrease acute rejection in some studies.

Dose adjustment depends on clinical response, immunological risk, C2 level and evidence of nephrotoxicity.

Target C2 levels in KT:

- 0 to 6 weeks -- above 1200 ng/ml.
- 6 to 12 weeks -- 1200 ng/ml.
- 3 months to 12 months -- 1000 ng/ml.
- After 12 months -- 800 ng/ml.

CIC is metabolized by the cytochrome P450 (CYP3A4) system — which is responsible for many drug-drug interactions.

Tacrolimus

In recent years use of tacrolimus is increasing for KT. Several generic preparations are now available, with potentially significant differences in bioavailability between brands.

Dose: 0.1to 0.2 mg/kg in two divided doses, with subsequent adjustment, according to whole blood trough level.

C0 (trough) levels correlate well with drug exposure (a significant advantage over CIC). Dose adjustment depends on clinical response, immunological risk, C2 level and evidence of nephrotoxicity.

Whole blood trough level:

TAC+AZA (month 1-3) : 7-20 ng/ml.
TAC+AZA (month 4-12) : 5-15 ng/ml.
TAC+MMF (month 1-12) : 4-11 ng/ml.
TAC+ Basiliximab induction (month 1-2) : 5-17 ng/ml.
TAC+ Basiliximab induction (month 3-12) : 4-12 ng/ml.
TAC without Basi DCIMCJ 2017 July; 4 (2): 12-18
2) :6-20 ng/ml.
TAC without Basiliximab induction (month 3-12) :6-14 ng/ml.

In renal impairment lower end of the dosing range should be used.

CNI side effects:

- **Nephrotoxicity:** initially reversible renal vasoconstriction leading to low GFR, subsequently irreversible interstitial fibrosis. On transplant biopsy fibrosis is found in 5% ESRD after 10 years.
- High BP
- Headache (severe neuropsychiatric issue).
- Tremor.
- Liver dysfunction.
- Post-transplant DM
- May potentiate delayed graft function (DGF).
- High serum K+ (type IV RTA).
- High uric acid (gout).
- Low Mg2+.
- Thrombotic microangiopathy (TMA).
- Hirsutism (esp. hyperpigmented patients),
- Gum hypertrophy (CIC>TAC), hair loss (TAC>CIC).
- Dyslipidaemia (CIC>TAC)
- Diarrhoea (TAC>CIC). Severe diarrhoea may significantly increase TAC levels (enterocytes that normally secrete TAC into the gut lumen are destroyed, causing less TAC elimination via this route).

CNI drug interactions:

- Statins should be prescribed at **low dose** and titrated cautiously. Because statin levels are significantly increased by CNIs (CIC>TAC) that may lead to rhabdomyolysis and high CPK.

- **Higher mycophenolate mofetil (MMF) doses** are required in recipients treated with CIC. Because CIC inhibits the entero-hepatic recirculation of MPA.

- The following drugs increase the nephrotoxicity of CNIs: NSAIDs, aminoglycosides, amphotericin B.

- Drugs increasing K+: ACE-I/ARB, K+sparing diuretics.

Mycophenolic acid:

MMF and enteric-coated mycophenolate sodium (EC-MPS) are important components of immunosuppressive regimens that are associated with some of the most successful outcomes in kidney transplantation.[8]

MMF and MPS are the ester and sodium salt of the mycophenolic acid (MPA).It is a reversible inhibitor of inosine monophosphate dehydrogenase (IMPDH), a critical enzyme for lymphocytes, leading to decreased proliferation of activated T and B lymphocytes.

MMF forms part of the triple therapy with CIC, and steroid and decreases acute rejection, more than azathioprine.

SE: Gastrointestinal side effects can be problematic. Diarrhoea in 30%, gastritis in 20%, nausea, vomiting, constipation, dyspepsia. Bone marrow suppression is relatively common. Infections (eg.CMV) are more common than with AZA.

MMF has relatively few important drug interactions. CIC decreases entero-hepatic recirculation of MPA, so higher doses of MMF are required than with TAC.

MPA sodium is available as an enteric-coated, slow-release formulation, designed to decrease GI side effects (Myfortic).

In fact, randomized controlled trials have found no significant difference in gastrointestinal adverse events between MMF and EC-MPS.[9,10]

Initial dose: MMF 1g bd, some centres use 1.5g bd for black recipients; MPA 720mg bd. Subsequent dosing will depend on local protocols, CNI levels, and side effects (including bone marrow tolerability).

There is very marked interpatient variability in plasma MPA levels.

Azathioprine (AZA):

It is metabolized to a purine analogue (6-thioguanine), which competitively inhibits purine synthesis (for RNA and DNA). This inhibits all cell replication, including decreased T cell proliferation. AZA remains a good option in TAC-treated patients with MMF related GI side effects.It is used in transplantation for >40 years.

Dose: Usual starting dose is 1.5 – 2 mg/kg once daily. Reduce if WCC <4.0 x 10 9 /L and stop if <2.0 x 10 9 /L.

SE: Bone-marrow suppression, hepatitis, cholestasis, pancreatitis.

Interactions:

Allopurinol should be used with great caution with azathioprine, as AZA is also metabolized by xanthine oxidase (potentiates AZA induced bone marrow suppression). Transfer to MMF should be considered.

Corticosteroids:

Decreased cytokine-regulated lymphocyte signalling, decreased cell (e.g.lymphocyte) activation, and decreased lymphocyte homing to areas of inflammation.

Familiar toxicity: Insomnia, weight gain, hypertension, high cardiovascular (CV) risk, diabetes mellitus, dyslipidaemia, mood disturbance, poor wound healing, osteoporosis, acne, proximal myopathy.

Dose: Huge centre to centre variation. Typical: pulsed steroids at the time of KT, followed by 20mg prednisolone orally for at least 4 weeks, then gradual reduction to maintenance 5mg daily.

Steroid withdrawal:

The side effects of steroid use have made their withdrawal popular.

However, RCTs involving withdrawal at 3 – 4 months have shown significantly increased risk of rejection.

However, the benefits of late steroid withdrawal from a maintenance dose are likely to be quite marginal. Before withdrawal the risk/benefit ratio must be careful explained to the patient.

Early withdrawal (e.g.first week) or total avoidance of steroid is increasingly popular with antibody induction and TAC-/MMF-based regimens.

Newer immune suppressants:

Belatacept

- A fusion protein comprising an immunoglobulin domain and modified CTLA4 (a T cell molecule, required for T cell activation).
- It is designed to bind to the APC surface co-stimulatory ligands CD80 and CD86 strongly.
- Must be given IV every 4 – 6 weeks.
- Has been used in early studies to allow CNI avoidance.
- Experimental studies suggested that the interruption of co-stimulatory signals could lead to donor-specific graft tolerance.
- It is approved only for Epstein-Barr virus (EBV)–seropositive patients, because of increased risk of post-transplant lymphoproliferative disorder (PTLD), especially of the central nervous system in EBV-seronegative patients.[11] There is also increased risk of PML, an often progressive and fatal CNS infection caused by the JC virus, a polyomavirus.

Eculizumab:

- A humanized monoclonal antibody that targets complement protein C5, inhibiting its cleavage to C5a and C5b and preventing formation of the membrane attack complex (MAC).
- It has been primarily used to treat and prevent atypical hemolytic uremic syndrome (aHUS).[12]

- It may have a prophylactic role in transplants at high risk for these conditions.
- All patients should receive vaccination against Neisseria meningitides prior to receiving eculizumab.
- Clinical trials, predominantly in antibody-incompatible renal transplantation, are ongoing to determine the optimal use.
- It is very expensive medicine.

Kidney transplantation is a treatment option only, not a cure. Although transplantation may restore kidney function, it does not necessarily remove the cause of the original kidney disease. Glomerulonephritis (GN), hypertension and diabetes are the three leading causes of end-stage renal disease (ESRD) worldwide and the diseases may recur in the transplanted kidney. The longer transplanted kidney remains in situ, the more likely it is to be affected by recurrence. Therefore each patient with ESRD should take decision whether he or she wishes to continue conservative treatment or start dialysis or receive a transplant. The outcomes of the options are not same. So it is the responsibility of the treating physician and team to ensure that each patient is properly informed to make that choice. Of course, the decision depends not only on the medical facts but also the legal, financial and other social factors. The ultimate prognosis of ESRD patients is obviously influenced by modalities of treatment, co-morbid conditions and support of the other family members.

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Original Article

DCIMCJ 2017 July; 4(2): 26-33

A Comparative Study of Craniosonogram and CT Scan of Brain in Perinatal Asphyxia

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Abstract:

Background: Perinatal asphyxia is an important birth complication. CT scan and MRI of head are important investigations for early diagnosis of this condition, but these tests are costly and not readily available everywhere. This study was carried out to compare the performance of cranial ultrasonography (craniosonography) with that of CT scan of brain in the diagnosis of perinatal asphyxia. Materials and Methods: This was a cross sectional study done in departments of Radiology, Paediatrics and Neonatology of BSMMU from January 2009 to June 2010. Thirty-nine neonates (both term and preterm) with suspected or diagnosed as having perinatal asphyxia were included. Patients with known congenital CNS malformations, meningitis and patients in whom sonography and CT could not be performed within 48 hours of each other were excluded. Results: Among the 39 babies 27(69.2%) were male and 12(30.8%) were female, with mean (±SD) age 12.8±7.7 days. Mean (±SD) of first minute APGAR score was 6.0±0.56 with a minimum of 5.0 and a maximum of 7.0. Mean (±SD) of fifth minute APGAR score was 7.6±0.58 with a minimum of 6.0 and a maximum of 8.0. Mean (±SD) blood glucose level was 3.87±0.49 mmol/L with a range of 3.2-4.5 mmol/L and serum bilirubin was 14.1±1.9 mmol/L with a range of 9.4-18.6 mmol/L. Toxemia of pregnancy was present in 2 (5.1%) mothers, 6(15.4%) mothers had multiple pregnancies and no mother had antepartum haemorrhage. Twenty-four (61.5%) mothers had anaemia, 6(15.4%) had infection, 4(10.3%) had edema and 5(12.8%) had hypertension during pregnancy. Craniosonography diagnosed 26(66.6%) patients as having cerebral pathology and 13(33.3%) patients as normal brain structures, whereas CT scan of brain diagnosed 29(74.4%) patients as having cerebral pathology and 10(25.6%) patients as normal brain structures. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of craniosonogram were 86.2%, 90%, 96.2%, 69.2% and 87.2% respectively. The Positive likelihood ratio was 8.6 and negative likelihood ratio was 0.15. Conclusion: Craniosonogram has high diagnostic performance in neonates with perinatal asphyxia. It can be used as an alternative diagnostic tool to detect the cerebral pathology that may occur as sequelae of perinatal asphyxia.

Keywords: Craniosonogram, perinatal asphyxia, CT scan of brain.

Introduction:

Perinatal asphyxia is one of the most devastating complications associated with the process of birth. Medical complications that arise from this condition affect not only the brain, but also many other organ systems critical for the maintenance of life. An increased understanding of the multifactorial nature of this disease is needed for all health care workers to improve care for patients with this condition[1].

Ultrasonography (USG), computed tomography (CT) and magnetic resonance image (MRI) are being routinely used to screen the neonate for probable intracranial problems. However, MRI is not available in most of the hospitals of Bangladesh, especially at the periphery. Also, most of the neonates are too sick to be investigated by MRI. Furthermore, cost concerns preclude the use of MRI in many cases[2]. The advantages of CT include its

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easy availability and high spatial resolution. CT provides excellent anatomic resolution of the entire brain parenchyma. Also, it is not operator dependent and can be more rapidly performed as compared to MRI. CT can reliably distinguish between subdural and subarachnoid bleed, which is difficult on sonography. However in premature infants the role of CT for the documentation of acute HII (hypoxic-ischaemic injury) is limited. High water content of the premature brain precludes the use of decreased attenuation as an index of cerebral edema. CT scan significantly offers a total radiation dose in sick children[3].

Though sonography cannot detect small cortical hemorrhage, differentiate subarachnoid from subdural hemorrhages and is relatively insensitive to acute HII, the advantages of USG are that it is non-invasive, easily available, cheap, quick and easy to perform method at the bedside. Also, it does not use ionizing radiation. All of these properties makes ultrasonography a useful, safe and repeatable modality in the diagnosis and follow up of asphyxiated infants[2,3]. Yet, only few studies have attempted to compare the role of craniosonogram and CT scan of the brain in the setting of specific neuroimaging findings like hemorrhagic and ischemic lesions in preterm and term infants. The purpose of this study was to compare the role of cranial sonogram and CT scan of the brain to delineate the pathology of brain in perinatal asphyxia of preterm and term infants; and to assess the diagnostic performance of craniosonogram by comparing with CT scan of brain as gold standard.

Materials and Methods:

This study was a cross-sectional comparative study, performed in the departments of Radiology and Imaging, Neonatology and Paediatrics in Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka from January 2009 to June 2010. The study population was neonates with suspected or diagnosed as having perinatal asphyxia admitted in the Department of Neonatology or Pediatrics, BSMMU, Dhaka. Both term and preterm infants were included. Patients with known congenital CNS malformations, meningitis and patients in whom sonography and CT could not be performed within 48 hours of each other were excluded from the study. The calculated sample size was 39, who were selected by purposive sampling. Ethical clearance was taken from the "Ethical Review Committee" of Bangabandhu Sheikh Mujib Medical University. Informed written consent was taken from the parents/ legal guardians of the neonates. Perinatal asphyxia was defined as a "failure to initiate and sustain breathing at birth".

In Ultrasonogram Voluson 730 Pro, GE Healthcare Austria was used. The infant was kept warm during procedure. Coupling gel was kept at body temperature. Patients were positioned as supine with head facing upwards and prone with head lying on either side. For premature infants less than 32 wk gestation or less than 1500 gm, 7.5 MHz transducer was used, while 5.0 to 3.0 MHz transducers were used for term and older inants with open fontanelle. Coronal, sagittal and axial scans were obtained. Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV), positive likelihood ratio and negative likelihood ratio were calculated for craniosonogram considering CT scan of brain as gold standard of diagnostic criteria. SPSS version 12.0 for windows statistical software was used for all data entry and statistical analysis. P value <0.05 was considered significant.

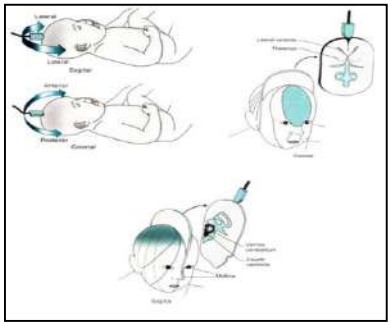


Figure 1: Scanning Technique of Craniosonogram

Results and observations:

A total of 39 babies with perinatal asphyxia were studied to the diagnostic performance of craniosonography by comparison with CT scan of brain. The mean (±SD) age of the patients was 12.8±7.7 days with a minimum of 1 day and maximum of 29 days. Among the 39 babies 27(69.2%) were male and 12(30.8%) were female. Regarding anthropometric variables of the patients, the mean (±SD) occipito-frontal length in supine position (OFC) of the patients was 31.4±1.5cm with a minimum of 29 cm and maximum of 35 cm, the mean (±SD) length of the patients was 47.05±2.6 cm with a minimum of 42 cm and maximum of 52 cm and the mean (±SD) weight of the patients was 2557.2±820.2 gm with a minimum of 1135gm and maximum of 4000 gm. The mean (±SD) Gestational age was 32.0±2.6 weeks with a minimum of 28 weeks and a maximum of 40 weeks. The mean (±SD) of first minute APGAR score was 6.0±0.56 with a minimum of 5.0 and a maximum of 7.0. The mean (±SD) of fifth minute APGAR score was 7.6±0.58 with a minimum of 6.0 and a maximum of 8.0. The mean (±SD) of delay of crying of the baby was 7.5±1.7 minutes with a minimum of 5.0 minutes and a maximum of 10 minutes and the mean (±SD) of Respiratory rate was 47.5±5.6 with a minimum of 36.0 and a maximum of 56.0. Twenty-three (59.0%) babies had poor ability to feed, while 16(41.0%) babies were totally unable to feed or suck. Regarding clinical presentation, 37(94.9%) babies had lethargy or inactivity, 29(74.4%) had irritability, 21(53.8%) had respiratory difficulty or distress, 13(33.3%) had convulsion ad 3(7.7%) had cyanosis. Presentation was non cephalic in 22(56.4%) patients. Muscle tone was decreased in 12(30.8%) babies, while 20(51.3%) had increased tone and 7(17.9%) had normal tone. Mild encephalopathy was present in 5(12.8%) patients, moderate encephalopathy was present in 4(10.3%) patients and 30(76.9%) patients had no encephalopathy. Neonatal infection was present in 14(35.9%) patients, Neonatal apnoeic spell was present in 6(15.4%) patients, and transient tachypnoea of newborn was present in 3 (7.7%) patients and neonatal jaundice in 4 (10.3%) patients. Neonatal hypothermia, hypocalcaemia, hypoglycaemia, and hyperglycaemia was not present in any patient.

The mean (±SD) of total RBC count of the study subjects was 3.5±0.2 million/cumm with a range of 3.3-4.1 million/cumm, the mean (±SD) of Hb% was 12.3±0.4 gm/dl with a range of 11.3-13.2gm/dl, the mean (±SD) of total WBC count was 15,658±1,194 with a range of 13,000-16,700 and the mean (±SD) of total platelet count was 1,66,538±14,606 with a range of 1,50,000-2,10,000. Regarding serum electrolytes, the mean (±SD) serum Na+ was 143.5±5.6 mmol/L with a range of 135.0-152.0 mmol/L, the mean (±SD) serum K+ was 4.6±0.3 mmol/L with a range of 3.4-5.1 mmol/L, the mean (±SD) serum Cl- was 109.9±3.9 mmol/L with a range of 105.0-114.7 mmol/L and the mean (±SD) serum Ca++ was 2.1±0.26 mmol/L with a range of 1.68-2.5 mmol/L. Mean (±SD) blood glucose level was 3.87±0.49 mmol/L with a range of 3.2-4.5 mmol/L and serum bilirubin was 14.1±1.9 mmol/L with a range of 9.4-18.6 mmol/L.

Regarding maternal variables, mean (±SD) maternal age was 21.8±4.4 years with a minimum of 16 years and a maximum of 30 years and the mean (±SD) maternal weight was 45.9±4.9 Kg with a minimum of 39 Kg and a maximum of 56 Kg. Five (12.8%) mothers had no antenatal check up, 6(15.4%) mothers had one antenatal check up, 14(35.9%) mothers had two and three time antenatal check up. Toxemia of pregnancy was present in 2 (5.1%) mothers, 6(15.4%) mothers had multiple pregnancies and no mother had antepartum haemorrhage. Twenty-four (61.5%) mothers had anaemia, 6(15.4%) had infection, 4(10.3%) had edema and 5(12.8%) had hypertension during pregnancy. Four (10.3%) mothers had fever at the time of delivery. Twenty-one (53.8%) mothers delivered their babies by normal vaginal delivery and caesarian section was done in 18(46.2%) mothers. Twelve (30.8%) mothers delivered their babies at home, 15(38.5%) mothers delivered their babies at private clinic, 9 (23.1%)

mothers at maternity home and 3(7.7%) mothers at tertiary care hospital. Delay in onset of spontaneous respiration was present in 9(23.1%) patients, resuscitation and or ventilation was needed in 7(17.9%) patients and fever was present in 3(7.7%) patients. maternal nephritic syndrome and congenital hydrocephalus or meningocele was not present in any patient.

Craniosonography diagnosed 26(66.6%) patients as having cerebral pathology and 13(33.3%) patients as normal brain structures. Among the patients with cerebral pathology hypoxic ischaemic change was found in 9(23.1%) patients, generalized atrophy of brain in 5(12.8%) patients, hypoxic ischaemic changes with generalized atrophy of brain in 5(12.8%) patients, cerebral edema in 4(10.3%) in patients and hypoxic ischaemic changes with subependymal cysts in3(7.7%) patients. CT scan of brain diagnosed 29(74.4%) patients as having cerebral pathology and 10(25.6%) patients as normal brain structures. Among the patients with cerebral pathology hypoxic ischaemic change was found in 10(25.6%) patients, generalized atrophy of brain in 6(15.4%) patients, hypoxic ischaemic changes with generalized atrophy of brain in 8(20.5%) patients, cerebral edema in 3(7.7%) patients and hypoxic ischaemic changes with subependymal cysts in2(5.1%) patients.

Regarding the comparative diagnosis between craniosonogram and CT, generalized atrophy of brain was detected in 5(12.8%) patients by craniosonogram and 6(15.4%) patients by CT scan. Cerebral edema was found in 4(10.2%) patients by craniosonogram and 3(7.7%) patients by CT scan. Craniosonogram detected 9(23.1%) patients having Hypoxic ischaemic change, 3(7.7%) patients with hypoxic ischaemic changes with subependymal cysts and 5(12.8%) with hypoxic ischaemic change with generalized atrophy of brain, whereas CT scan diagnosis diagnosed 10(25.6%) patients having hypoxic ischaemic change, 2(5.1%) patients with hypoxic ischaemic changes with subependymal cysts and 8(20.5%) with hypoxic ischaemic change with generalized atrophy of brain. Normal sonographic finding was found in 13(33.3%) patients and normal CT scan findings were found in 10(25.6%) patients. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of craniosonogram were 86.2%, 90%, 96.2%, 69.2% and 87.2% respectively. The Positive likelihood ratio was 8.6 and negative likelihood ratio was 0.15.

Table-I: Cross-tabulation of Craniosonogram and CT scan diagnosis (N=39)

Diagnostic tool		**CT diagnosis**						
		Generalized atrophy of brain	Cerebral edema	Hypoxic ischaemic change	Hypoxic ischaemic changes with subependymal cysts	Hypoxic ischaemic change with generalized atrophy of brain	Normal	Total
USG diagnosis	Generalized atrophy of brain	5	0	0	0	0	0	5
	Cerebral edema	0	3	0	0	0	1	4
	Hypoxic ischaemic change	0	0	7	0	2	0	9
	Hypoxic ischaemic changes with subependymal cysts	0	0	0	2	1	0	3
	Hypoxic ischaemic change with generalized atrophy of brain	0	0	0	0	5	0	5
	Normal	1	0	3	0	0	9	13
	Total	**6**	**3**	**10**	**2**	**8**	**10**	**39**

Table-II: Comparison between craniosonogram and CT scan diagnosis (N=39)

Pathology	Craniosonogram	CT scan diagnosis
	n (%)	*n (%)*
Generalized atrophy of brain	5(12.8%)	6(15.4%)
Cerebral edema	4(10.2%)	3(7.7%)
Hypoxic ischaemic change	9(23.1%)	10(25.6%)
Hypoxic ischaemic changes with subependymal cysts	3(7.7%)	2(5.1%)
Hypoxic ischaemic change with generalized atrophy of brain	5(12.8%)	8(20.5%)
Normal finding	13(33.3%)	10(25.6%)

Table-III: Cross-tabulation of performance test (N=39)

Diagnostic tool		**CT scan**		
		Cerebral pathology	Normal finding	Total
Craniosonography	Cerebral pathology	25(a=TP)	1(b=FP)	26(a+b)
	Normal finding	4 (c=FN)	9(d=TN)	13(c+d)
	Total	29(a+c)	10(b+d)	39(a+b+c+d=N)

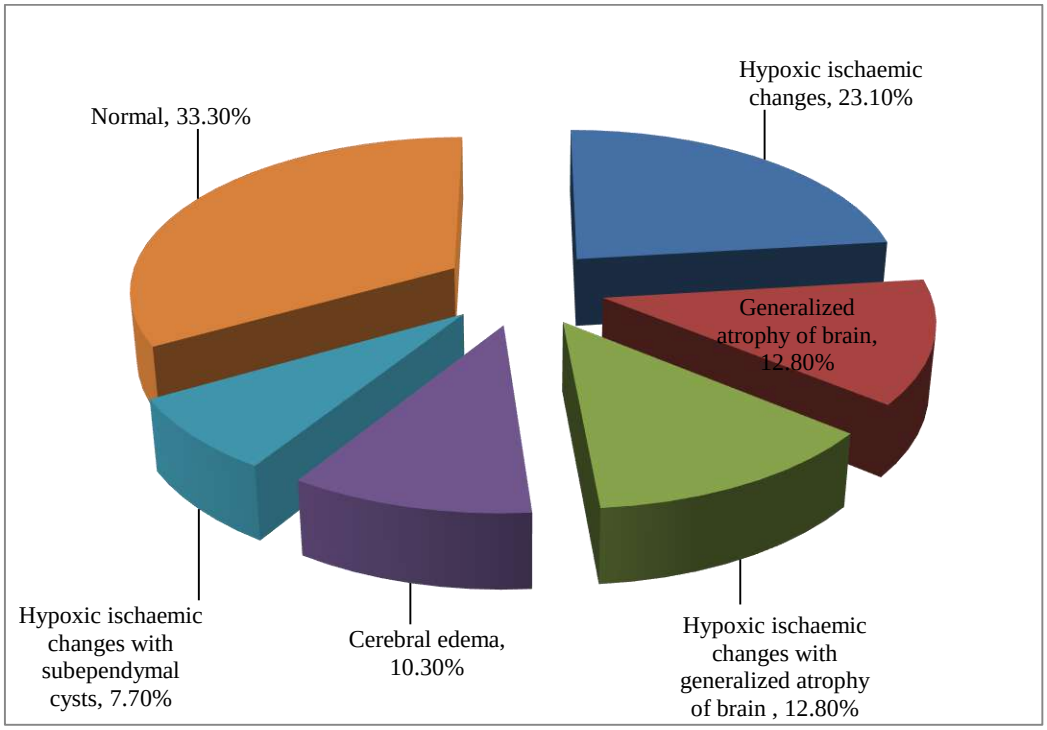


Figure-2: Pie chart showing Craniosonographic diagnosis (N=39)

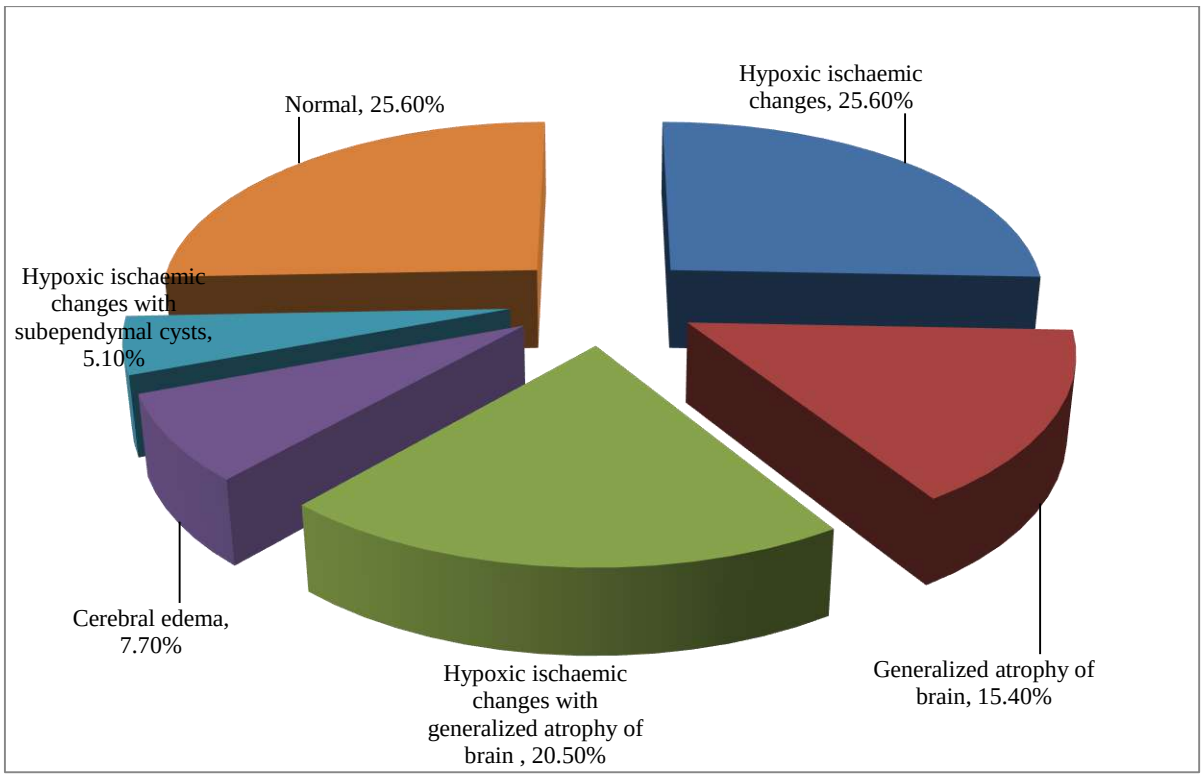


Figure-3: Pie chart showing CT scan diagnosis of brain (N=39)

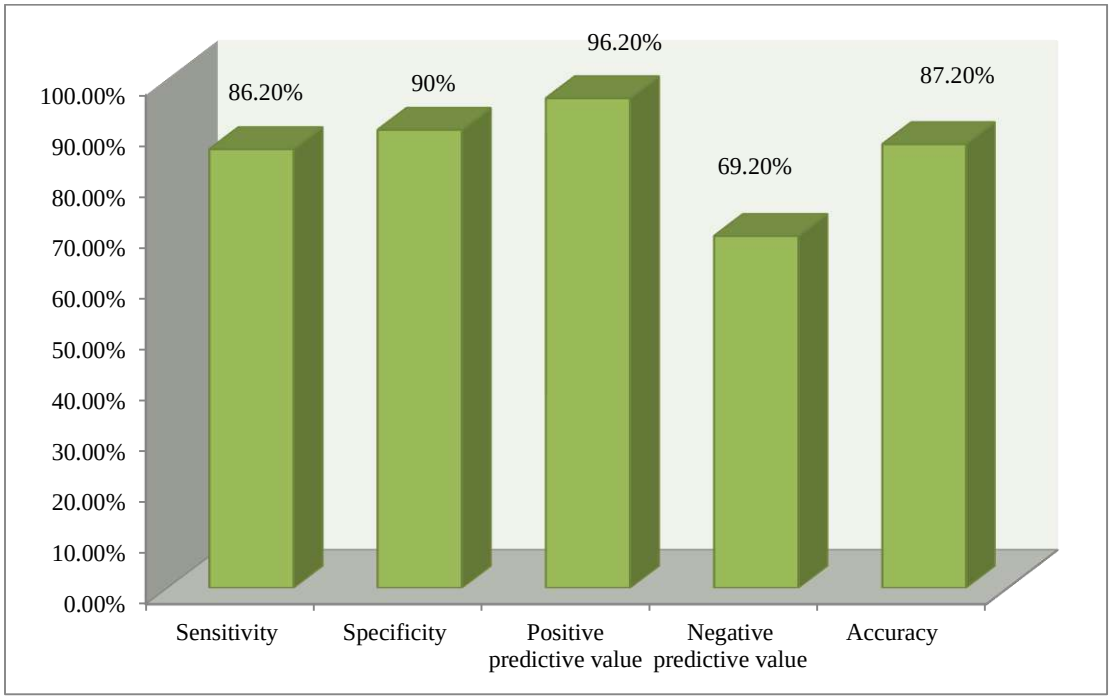


Figure-4: Bar diagram showing performance of craniosonography (N=39)

Discussion:

The objective of the study was to compare and evaluate the accuracy of craniosonogram with CT scan of brain in detecting CNS complications in babies with perinatal asphyxia. For this purpose we evaluated 39 babies with perinatal asphyxia. Similar studies have been published in different national and international journals. We have compared our findings with those observations.

Craniosonography diagnosed 66.6% patients as having cerebral pathology and 13(33.3%) patients as normal brain structures. CT scan of brain diagnosed 74.4% patients as having cerebral pathology and 25.6% patients as normal brain structures. Gerard et al (1981) supported our findings[4]. They studied 27 infants by computerized tomographies of the brain having suffered from severe birth asphyxia. CT were normal in 11 babies, hemorrhage was found in 5 infants, hypodense areas in 3, brain edema in 4, atrophy in 5, pseudo-porencephalic cysts in 2 and lesions of the central nuclei in 2 subjects[4]. Dios and Moya (1996) investigated 115 perinatal asphyxia in term neonates in a prospective epidemiologic study[5]. They found relationship between perinatal asphyxia, hypoxic-ischemic encephalopathy and neurologic sequelae (cerebral palsy, mental retardation, neonatal death) at follow-up. Their findings also support our observations[5].

The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of craniosonogram were 86.2%, 90%, 96.2%, 69.2% and 87.2% respectively. The Positive likelihood ratio was 8.6 and negative likelihood ratio was 0.15. Yikilmaz and Taylaor (2008) described that sonography remains an important tool in the initial evaluation of intracranial abnormalities in critically ill term and near term infants[6]. Cranial sonography is highly accurate and sensitive in the characterization of cerebral lesions in the term newborn. Erdem et al (2003) stated that though sonography can not detect small cortical hemorrhage, differentiate subarachnoid from subdural hemorrhages and is relatively insensitive to acute hypoxic-ischaemic injury (HII), the advantages of USG are that it is non- invasive, easily available, cheap, quick and easy to perform method at the bedside[2]. Also, it does not use ionizing radiation. All of these properties allows ultrasonography a useful, safe and repeatable modality in the diagnosis and follow up of asphyxiated infants[2,3].

Limitations of the study:

The study had some limitations. The sample size was small. The study was conducted in only one center. Random sampling method was not applied.

Recommendation:

A multicentric study including different hospitals of peripheral part of the country with large sample size should be undertaken to confirm the study finding.

Conclusion:

The study showed high diagnostic performance of craniosonogram in neonates with perinatal asphyxia. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of craniosonogram were calculated to be 86.2%, 90%, 96.2%, 69.2% and 87.2% respectively. So craniosonogram can be used as an alternative diagnostic tool to detect the cerebral pathology that may occur as sequelae of perinatal asphyxia.

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Original Article

DCIMCJ 2017 July; 4(2): 34-39

Correlation of Total and Intercrease Lengths of Middle Finger with Stature in Garo Tribal Adult Females of Bangladesh

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Abstract:

Data on the physical dimension of the hand correlated with stature of Bangladeshi women including tribals are scanty. Reconstruction of the stature is one of the important aspects of various parameters of identification for establishing the individuality of a person. Moreover, this information is necessary to ascertain human-machine compatibility in the design of manual systems for the bare and gloved hand, such as design and sizing of hand tools and in different kinds of precised and skilled movements of hands as many females are working now days in Garments sector of Bangladesh. The present study was undertaken to generate anthropometric data of middle finger length and 2nd intercrease length of middle finger of 100 Garo tribal adult (aged 25-45 years) women of Bangladesh. Stature, 2nd intercrease length of middle finger and the length of the middle fingers of both hands of 100 individuals have been measured. The multiplication factor and regression equations have been drawn from the data collected. It has been observed that stature can be estimated from the 2nd intercrease lengths and finger length also.

Keywords: Anthropology, Intercrease length, Correlation, Multiplication factor, Stature

Introduction:

There is an established relationship between stature and various body parts like head, trunk, upper and lower extremities. It is common to find the peripheral parts of the body such as hand and foot in explosions, aircraft and railway accidents. So many studies have been conducted in different ethnic groups to estimate stature from hand dimensions.[1] Estimation of stature from finger length and length of phalanges can be used as an alternative measure to stature when stature cannot be measure directly due to deformities like Kyphosis, Lordosis and Scoliosis, Contracture or Missing legs. A number of workers have studied the correlation between stature and various long and short bones of the body. Many of them have correlated the dimensions of hand with the stature. But very few studies of stature estimation are reported based on digits and phalanges of hand. Even more limited are the studies taking into account all the digits and phalanges of hand.[1] Thus the present study is planned to find out a relationship of length of middle finger and 2nd intercrease length (which was described as middle phalangeal length by most of the author) of the same finger with body stature in Garo tribal population of Mymensingh and Dhaka region.

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Methods:

The study was basically observational, cross-sectional and descriptive in nature, was carried out on 100 Christian Garo adult females at different

locations of Dhaka city and Mymensingh district. While selecting the subjects, the question of age was a very important factor. This was because bone length and stature are related to ossification and epiphyseal fusion with diaphysis and both these events are age dependent. Subjects for the study were 100 middle class Christian Garo adult females between the ages of 25 and 45 years. In the context of unavailability of reliable information on tribal people regarding such issue, foreign data have been considered while selecting the age range of the subjects of the present study.

Inclusion criteria:

a) Garo by ethnicity
b) Bangladeshi by nationality
c) Christian by religion
d) Female by sex
e) Aged between in 25 and 45 years

Exclusion criteria:

a) Mixed in origin- If there was any history of marriage with Bengali people or with any other tribe within three generations.
b) History of:
    I. Genetic disorder (s)
    II. Endocrine disorder (s)
    III. Trauma that can affect stature or other variables
c) Neurological findings that can affect the features of the extremities

Procedures for measuring the stature:

To measure the stature the subject was said to stand with her heel together and her back as straight as possible so that her heels, buttocks, shoulders and the head touched the wall. The arms were hung freely by the sides with the palm facing the thighs.[2] After asking the subject to take a deep breath and holding it, a measuring scale (steel plate) was placed against the head and wall to determine maximum height on the wall, and this was marked. The subject was then told to breathe and to step away from the wall. The height was then measured from the floor to the mark on the wall with steel tape which represents the stature in centimeters to the nearest 0.1 centimetres.[2]

Procedures for measuring the 2nd intercrease length of middle finger:

The units of measurement were to be in centimeters and participants were asked to record their measurements. It was measured with the help of a digital sliding caliper. It was measured as the distance between two phalangeal ridges[3] in case of the middle phalanges of middle fingers of both hand. The subject placed her hand on a table with the fingers together and thumb abducted. (Figure1).

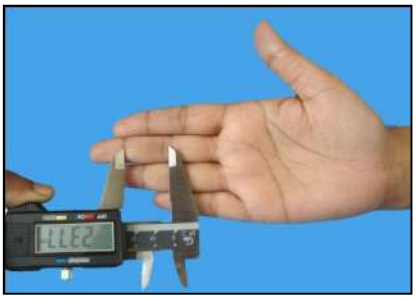


Fig.1 Procedure for measuring of 2nd intercrease length of middle finger.

Procedures for measuring the length of middle finger:

The units of measurement were to be in centimeters and digit lengths was measured on the ventral surface of the hand from the most proximal crease of the digit to the tip of the third digits of right and left hand using slide caliper.[4]

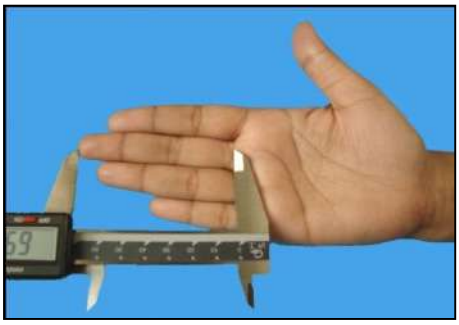


Fig.2 Procedure for measuring the length of middle finger.

Calculations of multiplication factor:

Each multiplication factor is the ratio of the stature to the respective physical measurements. A mean multiplication factor was then calculated for each measurement. These mean multiplication factosr were used for estimating the stature from those variables. According to Lal and Lala [5] multiplication factor is

$$M.F = \frac{\text{Stature}}{\text{Upper limb variables (e.g: middle finger length)}}$$

Statistical analyses of data:

Results were prepared on the basis of collected data and their distributions, central tendencies and standard deviations (SD) were calculated using a computer based programme (SPSS version-11.5 and MS Excel). Regression analysis was done .Mathematical relationships between sets of two measurements were calculated as multiplication factors (i.e., ratios between the two). Using the paired t test, the measured values were compared with the corresponding values estimated (using the corresponding multiplication factors) from other relevant measurements.

Results:

The observations and statistical outcomes of the study are presented in the tables. Multiplication factor for both variables were also determined. The mean height of Christian adult Garo female population with an age range from 25 to 45 years is 152.79 (±5.62) centimeters, with a minimum height of 137.00 cm and maximum of 168.50 centimeters (Table 1). The middle finger lengths are in proportion with the height of individuals. (Table 1 and 2). The objective of the study was to link the estimated stature with that of 2nd intercrease length of middle finger and finger length of the middle finger (Table 2). The regression equation for stature estimation for 2nd intercrease length and length of middle finger are observed to be statistically significant with a $p<.001$ (Table 1).

Table1. Stature, 2nd intercrease length of middle finger and the middle finger length, their descriptive statistics, multiplication factors and correlation with stature.

Variable	Range (cm)	Mean (cm) ± SD	Mean multiplication factor	Significance of correlation (p value)
Stature	137.00-168.50	152.79 ± 5.62	_	0.00(S)
Lengths of Right middle finger	6.31-8.24	7.08 ± 0.34	21.64	0.00 (S)
Left middle finger	6.23-8.20	7.10 ± 0.34	21.56	0.00 (S)
2nd intercrease lengths	1.84-2.64	2.20 ± 0.15	69.69	0.00 (S)
Right middle finger	1.78-2.66	2.19 ± 0.19	69.83	0.00 (S)
Left middle finger				

Table 2. Comparison between the 'measured' stature and the stature 'estimated' from Lengths of middle finger and 2nd intercrease length of middle finger

Measured variables other than stature	Measured stature (cm)	Estimated stature (cm) †		Significance of difference (p value)
	Mean ± SD	Range	Mean ± SD	
2nd intercrease length				
Right middle finger	152.79 ± 5.62	128.23-183.98	153.46 ± 10.64	0.55(NS)
Left middle finger		124.30-185.75	153.55 ± 11.46	0.53(NS)
Length of				
Right middle finger		136.55-178.31	153.12 ± 7.43	0.72(NS)
Left middle finger		134.32-176.79	153.08 ± 7.39	0.77(NS)

†The mean estimated stature against 2nd intercrease length and length of middle finger was obtained by multiplying each individual value for that variable by the respective mean multiplication factor and then calculating the mean for that.

Discussion:

Although no statistical analysis could be done between the results of the present study and those of other studies, some observations may be worth mentioning.

When the mean stature of the Garo females of the present study was compared to that of different female populations of the world, the following observations could be made.

The mean stature of the Christian Garo females is 152.79 (±5.62) centimetres within close range of those of the Chinese and Japanese and Mongoloid populations.[6, 7] While it is relatively greater than that of a rural Bengali female population, it is smaller than that of an urban Bengali female population.[8] The Garo's mean stature as found in the present study is also greater than that of the Austro-Asiatic "Santhals" of West Bengal[9] but smaller than that of the "South Indians" [10] female populations. In the present study the mean finger lengths of the middle finger of the right and left hand were 7.08 centimetres and 7.10 ± 0.34 respectively.

This is in agreement with findings of Nag and Desai (2003)[11] reporting to Indian females of Ahmedabad. However, South Indian[4] females show relatively longer (8.20 ± 0.51 and 8.22 ± 0.52 cm) middle finger. This reflects that geographic variations may affect on the physical dimensions.

In the present study the 2nd intercrease lengths of the middle fingers of the right and left hand were 2.20 ± 0.15 and 2.19 ± 0.19 centimetres respectively. This showed a relatively smaller value when compared to north Indian medical college student[1] and Punjabi[3] (mean value of both hand 3.32 ± 0.65 and 2.50 ± 0.21) respectively.

Conclusion:

From the present study we found some multiplication factors which will be helpful for estimation of stature from middle finger length and 2nd intercrease length for Garo tribal females of Bangladesh. That may be helpful for determining the stature of Garos who are working in the capital city and surrounding areas

especially in the various working sector of Bangladesh and also be helpful for forensic experts and anthropologists.

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Original Article

DCIMCJ 2017 July; 4(2) 19-25

Non-Cardiac Causes of Raised Troponin-I in Adult Patients Admitted Under Cardiology Department in a Tertiary Level Hospital

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Abstract:

Objective: To find out different causes of raised troponin-I in adult patients other than cardiac cause. Methodology: This cross sectional study was carried out enrolling 65 subjects with raised troponin-I, in the Department of Cardiology, BIRDEM, Dhaka, over a period of six months from July 2013 to December 2013. Results: Most common non-cardiac cause of raised troponin-I were sepsis (38.46%), CKD (32.3%), stroke (15.38%) and defibrillation (13.86%) in this present study. The mean age was 50.92 ± SD 12.77 years and their age ranged from 35 to 66 years. Majority (44.61%) of the respondents were found in the age group of 51-59 years. Gender distribution revealed that 40 (61.54%) were male and rests 25 (38.46%) were female . Hypertension (46.15%), dyslipidaemia (36.92%), diabetes mellitus (20%) and smoking (40%) were pre-existing risk factors in the study group. Chest pain (58.46%), breathlessness (46.15%), raised temperature (38.46%) and focal neurological deficit (15.38%) were the common presenting symptoms. X- ray revealed, cardiomagaly (9%) and pulmonary oedema (39%). Old infarct (12.3%), LV hypertrophy (43.07%) and arrhythmia (21.53%) were evident in ECG. Majority (52.3%) of the subjects had ≥60% LV dysfunction on Echocardiography. 18.46% had 50-59% LV dysfunction. 6.17 percent subjects had less than 30 % LV dysfunction. Conclusion: From the study result it can be concluded that subjects with sepsis, CKD, stroke and post-defibrillation are the commonly encountered with raised troponin-I in cardiology wards other than ACS. As such, it could be noted that in case of patients with raised troponin-I, these common condition should be excluded to avoid unnecessary treatment of ACS in subjects with raised troponin-I.

Keywords: Troponin-I, Cardiac biomarker.

Introduction:

Acute coronary syndromes (ACS) constitute a large spectrum of clinical conditions ranging from unstable angina to Non ST elevated myocardial infarction (NSTEMI) and acute ST-elevation myocardial infarction (STEMI). Cardiac serum markers, especially cardiac troponins, are the cornerstone of the diagnosis, risk assessment, prognosis, and determination of antithrombotic and revascularization strategies. Physicians should be aware of the wide spectrum of disease states that may result in elevation of cardiac troponins and have a clear understanding of the related pathophysiology to effectively make a differential diagnosis[1-3].

The European Society of Cardiology and American College of Cardiology Joint Committee has redefined myocardial infarction (MI) to be an elevation of serum cardiac troponins above the 99th percentile of the healthy reference population in the presence of ischemic signs and symptoms[2]. In addition, a rising and/or falling troponin pattern is an important component of the universal definition of MI[3-4]. Unexplained elevations of troponin might be due to cardiac and non-cardiac causes. Besides coronary disease troponin rises in conditions like myocarditis, stroke, renal failure, pulmonary embolism, acute heart failure, septic shock and as a result of

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cardiotoxic drugs as well as after therapeutic procedures like coronary angioplasty, electrophysiological ablations, or electrical cardioversions, pulmonary embolism etc[5,6]. Recent study showed that despite the value of cardiac troponins for ischemia diagnosis, risk stratification and management, it has become quite evident that non-ischemic elevation of the marker is not uncommon. In a recent study, examining 69,299 patients admitted through the emergency department, 48% had their Troponin I measured. Of these, 2,344 patients (3.3% overall, or 7.0% of those that had a Troponin I measured) had an elevated Troponin-I concentration. Of those with a positive Troponin-I, 42.7% of the patients did not have ACS[7].

Many patients are referred to coronary care unit from emergency and other in-patient departments with raised Troponin-I. But in many cases, after proper evaluation it is seen that the cause of raised Troponin-I was due to non-cardiac events other than cardiac causes. In this background this study was conducted in Department of Cardiology, BIRDEM General Hospital. Dhaka to see the non cardiac cause of raised Troponin-I.

Materials and Methods:

This descriptive cross-sectional study was carried out in department of Cardiology of BIRDEM from July 2013 to December 2013 to find out different causes of raised troponin I in adult patients other than cardiac cause, evaluating 65 subjects aged 35-64 years suffering from various diseases. Study subjects were selected by systematic random sampling from the referred patients to Department of Cardiology and also from in-patient department of the respective discipline. The selection criteria included patients of both genders of ≥18 years age, having raised Troponin-I and willing to participate in the study.

Those unwilling to participate in the study or age<18 years were excluded. Data was collected from every even number patient from their guide books and hospital records. Patients were thoroughly informed about the aims, objectives and detail procedure of the study before examination. He/She was encouraged for voluntary participation and allowed freedom to withdraw from the study whenever he/she liked even after participation. From all eligible subjects after getting consent clinical history was taken and clinical examinations were done. Related investigations including troponin-I with other investigations like RBS, lipid profile, serum creatinine, chest radiography, ECG and echocardiography were also done. Demographic information was prospectively recorded and substantiated by means of inspection of medical record.

Ethical considerations:

Prior to the commencement of this study the research protocol was approved by Ethical Review Committee, Diabetes Association of Bangladesh. The objectives of this study along with risks and benefit were fully explained to the subjects in easily understandable local language and then informed written consent was taken from each patient.

Results:

A total of 65 cases were included in the study. The mean age was 50.92 ±(SD) 12.77 majority (44.61%) of the respondents were found in the age group of 51-59 years. There was male predominance, with 40 (61.54%) of the respondents being male and rest 25 (38.46%) female.

The study subjects had hypertension (46.15%), dyslipidaemia (36.92%) and diabetes mellitus (20%) as pre-existing risk factors. Forty percent subjects were smoker. Chest pain and breathlessness were present in 58.46% and 46.15% subjects respectively. About 38.46% had raised temperature and 15.38% had focal neurological deficit as common presenting symptoms.

Causes of raised troponin-I in Non-cardiac cases were sepsis (38.46%), CKD (32.3%), stroke (15.38%) and defibrillation (13.86%). Mean troponin I levels were 4.42±3.44 ng/ml in sepsis, 2.29 ng/ml in CKD, 5.66±4.87 ng/ml in stroke and 1.39 ng/ml in defibrillation patients.

Biochemical parameters of the study subjects revealed that, mean serum creatinine level was 3.68

(±2.59) mg/dl. Random blood glucose (RBS) 8.0 mmol/l. Mean total cholesterol, LDL and triglyceride levels were raised, whereas mean HDL level was low. SGPT and SGOT levels were 37.89±14.71 and 34.61±18.25 mg/dl respectively. Mean total WBC count was raised (13500 ± 6500 /mm^3). Mean sodium, potassium, chloride and bicarbonate levels were within normal limits.

Among the chest X- ray findings of the study subjects, cardiomagaly was observed in 9% subjects. Pulmonary oedema was present in 39% subjects. Chest x ray was normal in 52% subjects.

ECG findings of the patients revealed old infarct (12.3%). LV hypertrophy (43.07%) and arrhythmia (21.53%) were also evident in ECG. On echocardiography, majority (52.3%) of the subjects had ≥60% LV dysfunction. 18.46% had 50-59% LV dysfunction. 6.17 percent subjects had less than 30 % LV dysfunction.

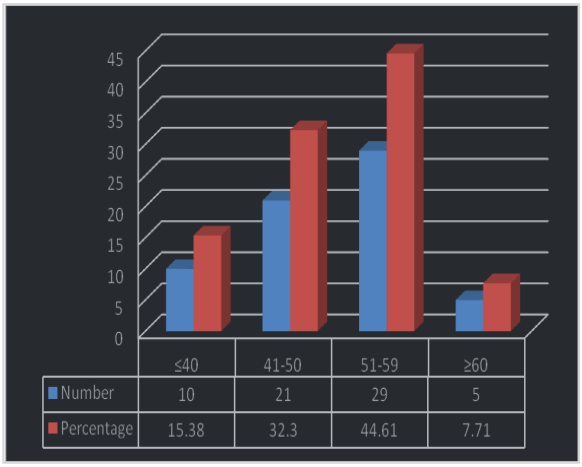


Figure 1: Bar diagram showing age distribution of the study subjects

Table I: Pre-existing risk factors of the study subjects (N=65)

Co-morbid conditions	Number	Percentage
Hypertension	30	46.15
Smoking	26	40.00
Dyslipidaemia	24	36.92
Diabetes mellitus	13	20.00

Table II: Symptoms of the study subjects (N=65)

Symptoms	Number	Percentage
Chest pain	38	58.46
Breathlessness	30	46.15
Raised temperature	25	38.46
Focal neurological deficit	10	15.38

Table III: Laboratory findings of the study subjects (N=65)

Laboratory parameters	Mean ± SD	± SD
Serum Creatinine (mg/dl)	3.68	±2.59
Total WBC count (/mm^3)	13500	± 6500
Serum Sodium (mmol/L)	141.25	±9.54
Serum Potassium (mmol/L)	4.5	±1.5
Serum Chloride (mmol/L)	98	±6
Serum Bicarbonate (mmol/L)	23	±6
RBS (mmol/L)	8.0	±2.9
Cholesterol (mg/dl)	201	±42.4
Triglyceride (mg/dl)	279	±156
HDL (mg/dl)	38.19	±14.67
LDL (mg/dl)	126	±43.7
SGOT	34.61	±18.25
SGPT	37.89	±14.71

Table IV: Levels of troponin I (ng/ml) among the study subjects (N=65)

Symptoms	Mean	±SD
Sepsis	4.42	±3.44
CKD	2.29	±1.94
Stroke	5.66	±4.87
After defibrillation	1.39	±1.13

Table V: ECG findings of the study subjects (N=65)

Common ECG Findings	Number	Percentage
LV hypertrophy	28	43.07
Arrythmia	14	21.53
Old infarction	08	12.30

Table VI: Echocardiographic findings of the study subjects (N=65)

Echocardiographic findings	Number	Percentage
LV dysfunction		
≥60%	34	52.30
50-59%	12	18.46
40-49%	09	13.84
30-39%	06	09.23
≤30%	04	06.17

Discussion:

As discussed previously, troponins are important cardiac biomarkers for the detection of acute coronary syndromes, but there are many clinical conditions other than myocardial infarction that cause troponin elevation. Thus, the physician should be aware of the wide spectrum of disease states that may result in troponin elevation and have a clear understanding of the related pathophysiology to effectively make a differential diagnosis[3,4]. In the present study, 65 patients were found to have raised troponin I due to causes other than acute coronary syndrome, with the causes being sepsis, CKD, stroke and post-defibrillation.

Troponin elevations in patients with sepsis are common. The mechanism of elevation of troponin in septic patients is unclear. One reason for the release of troponin-I from damaged myocardial cells might be an oxygen supply-demand mismatch of the myocardium[8]. Elective electrical cardio version in most patients does not result in troponin elevation. When present, elevations are mild. Elevations are common in patients with cardiac arrest who undergo direct-current shock (often multiple) or prolonged resuscitation, or both. Substantial elevation should suggest the presence of myocardial injury[9]. Both elevated troponin-I levels and electro-cardiogram (ECG) changes have been described in the setting of acute stroke or intracranial hemorrhage. The most likely explanation of troponin elevation and myocardial damage in the setting of intracranial hemorrhage is an imbalance of the autonomic nervous system, with the resulting excess of sympathetic activity and increased catecholamine effect on the myocardial cells.[10] Persistently elevated troponin is frequently observed among patients with chronic failure.

The prevalence of increased troponin values among patients with chronic renal failure in the absence of clinically suspected ischemia may be as high as 53%[9,10]. Similar result was seen in current study where it was seen that Non-cardiac cause of raised troponin-I were sepsis (38.46%), CKD (32.3%), stroke (15.38%) and defibrillation (13.86%). Other related study revealed troponins are increased in around 40% of patients with critical illnesses such as sepsis. There is an increased risk of mortality and length of stay in the intensive-care unit in this patients[11]. It was also revealed that mean troponin-I levels were 4.42±3.44 ng/ml in sepsis, 2.29 ng/ml in CKD, 5.66±4.87 ng/ml in stroke and 1.39 ng/ml in defibrillation.

It is to be remembered that rise of troponin-I in ACS had a pattern. When measured with older generation assays, elevated troponin levels can be detected 6-12 hours after onset of myocardial injury, peaking at about 24 hours, followed by a gradual decline over several days (up to 2 weeks). Modern assays can detect troponins as early as 3-4 hours after onset of myocardial damage. This has increased the sensitivity of point-of-care troponin testing in patients who present initially to the emergency department with symptoms suggestive of ischemia and myocardial damage. Most current guidelines recommend rechecking troponins 6-12 hours after the initial assessment and up to 24 hours after symptom onset[5]. In patients in whom subendocardial non–ST-segment elevation myocardial infarction (NSTEMI) is highly suspected, the troponin levels may be re-evaluated earlier, at 3-4 hours, as the markers may be detectable sooner[12,13].

Studies revealed that patients with CRF, sepsis, stroke commonly presented at 4th to 5th decades with a slight male predominance[7,8,14]. Similar results was observed in present study where mean age was 50.92 years with standard deviation of mean (SD) ± 12.77 years and 40 (61.54%) were male and rests 25 (38.46%) were female among total subjects. These patients had hypertension, uncontrolled DM with habit of smoking. Comparable similar risk factors were elicited in present study where hypertension (46.15%), dyslipidaemia (36.92%) and diabetes mellitus (20%) were pre-existing risk factors.

In present study, patients presented with chest pain, breathlessness, raised temperature and focal neurological deficit with laboratory findings of raised serum creatinine, dyslipidaemia and raised blood sugar levels. However, careful ECG and echo findings monitoring revealed that subjects had only LV hypertrophy and arrhythmia in ECG and LV dysfunction in echocardiography. These findings would differentiate these subjects with any acute ischemic features from those non-cardiac diseases.

Limitations:

The study had several limitations. As the study period was only six months, large sample could not be included and follow up could not be done. The sample size was relatively small. There was heterogeneity in the results of Troponin I cutoff levels as reports were done from different laboratories. Data was collected from only one center, which may not represent the picture of whole country.

Conclusion:

From this study it was found that subjects with sepsis, CKD, stroke and post-defibrillation were the commonly encountered with raised troponin-I in cardiology wards other than ACS. So, when dealing with a patient having raised troponin-I without typical clinical features of ACS, physicians should try to exclude the conditions mentioned above, to avoid the unnecessary burden of hospital stay, costly investigations and overzealous treatment caused by unnecessary and inappropriate referral of these patients to CCU.

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Original Article

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Antidiabetic Effects of Pre and Concomitant Treatment with n-Hexane Extract of Nigella Sativa Linn.

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Abstract:

The hypoglycemic effect of the both pre and concomitantly treatment with n-Hexane extract of Nigella sativa Linn in streptozotocin induced diabetic rats were investigated. Serum glucose, serum reduced glutathione, serum TG and cholesterol were performed in all the experimental group. Diabetes was induced in rats by the administration of streptozotocin (50mg/kg b.w) intraperitoneally. At first pretreatment by n-Hexane extract of nigella were administered before inducing diabetes then concomitantly from day 1 to 21. Rats were sacrificed on day 22. Serum glucose and triglyceride concentration of both pre and concomitant treated groups showed marked reduction. The increase in pancreatic reduced glutathione concentration was found in concomitantly treated groups and the elevated serum cholesterol concentrations were more reduced in concomitantly n-Hexane treated group. The n-Hexane extract of nigella concomitant to streptozotocin (STZ+Nc) administration appeared to provide better alleviation compared to the pretreatment.

Keywords: Diabetes mellitus, n-Hexane, hypoglycemia, Nigella sativa Linn.

Introduction:

Diabetes mellitus (DM) is the most common metabolic disease worldwide. Therapeutic compounds available to treat DM are either synthetic or formulated forms. Multiple medications and side effects, the most significant and prevalent themes in DM ultimately determine novel directions and avenues in drug discovery. Therefore, a variety of plants are used in the management and treatment of DM. Chemical and pharmacological studies on antidiabetic herbal remedies are in progress and might lead to inspiring elucidations[1]. Nigella sativa seeds, an annual Ranunculaceae herbaceous plant, have been used in folk medicine to treat diabetes[2].

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The glucose lowering and antidiabetic effects of NS has been reported in different diabetic animal models [3,4].

The protective effect of Nigella Sativa has been attributed to its strong antioxidant properties, which are related to its ability to scavenge various reactive oxygen species, including superoxide radical anion and hydroxyl free radicals, to block lipid peroxidation and to enhance antioxidant enzymes[5].

There are lot of studies had been done regarding the antidiabetic activity of NS extract and fixed oil. It is not known whether the active substance was more abundant in fixed oil or in extract form. This study was undertaken to analyse Nigella sativa for better understanding of its antidiabetic properties.

Materials & Methods:

The study was carried out in the department of Pharmacology, BSMMU.

A total of 50 adult male long evans Norwegian rats were obtained from the animal house of BSMMU.

The rats were 8-12 weeks old and weighed between 200-250 g. The rats were fed normal rat diet and given water ad libitum. Streptozotocin (STZ) Sigma Pharmaceuticals Ltd. This drug was stored at 0-4 c and was administered by single intraperitoneal injection at a dose of 50 mg/kg body wt.

Chemicals and reagents: Reagents for the estimation of serum glucose, serum TG and serum cholesterol were purchased from Human, Germany. Chemicals for the estimation of pancreatic reduced glutathione (GSH) were purchased from Sigma Aldrich Cheme GmbH.

Nigella sativa linn (kalajira) was purchased from the local market. After washing and drying, seeds were ground into a fine powder state. Incubated at 45-50˚ C temperature for 24-48 hours. Finally powdered by a blender to get a fine dried powder.

The seeds of Nigella were soaked in n-hexane for 48-72 hours. They were filtered and the filtrate was concentrated in a rotary vacuum evaporator.

After evaporation a concentrated dark brown oily extract of Nigella was obtained.

Experimental procedure: Group I (Control group) rats were fed with normal rat diet and water ad libitum. Rats of group II (STZ) received single intraperitoneal injection of streptozotocin (50 mg/kg, freshly dissolved in citrate buffer, pH 4.5) on day 1- day 21. Rats of Group III (H) were given n-hexane extract of nigella (10gm/kg/day) orally through Ryles tube from day 1-day 21 while streptozotocin was administered on day 11 to rats of group IV (H+STZ) and group V (STZ+H) were administered n-Hexane extract of nigella for 21 days concomitant with streptozotocin i.p. (50 mg/kg) (single dose) .

All rats were sacrificed on day 22. The rats were kept overnight fasting and only water was allowed to them and sacrificed under light chloroform anesthesia. Blood was collected in test tubes and serum was separated after centrifugation.

Table-I: Treatment schedule of the experimental groups

Groups	**I (C)**	**II (STZ)**	**III (H)**	**IV (H+STZ)**	**V (STZ+H)**
n	**8**				
	(Normal rat diet and water were given in all the experimental group)				
Treatment	Rat diet and water	STZ	n-Hexane extract of nigella	n-Hexane extract of nigella+STZ	STZ+n-Hexane extract of nigella
Dose and duration	As needed from day 1- day 21	50 mg/kg body wt – Day 11 only	10 gm/kg/day From day 1-day 21	10 gm/kg/day from day 1-day 21 + 50 mg/kg body wt on day 11	50 mg/kg body wt on day 1 and 10 gm/kg body wt from day 1-21
Day of sacrifice	Rats of all experimental group were sacrificed on day 22				

C=Control; STZ=Streptozotocin; H= n-Hexane extract of nigella; n=Number

Biochemical measurement: Serum glucose was estimated by oxidase peroxidase method[6]; pancreatic GSH concentrations were estimated spectophotometically by Ellman's method[7]; serum TG and Cholesterol were measured by triglyceride liquicolor and Chop-pap method[3] method respectively.

Statistical analysis: The results obtained from the experiment are expressed as mean ± SE of the number of samples. Students unpaired t-test was used to compare between the pre and concomitantly treatment groups. P<0.05 were taken as significant.

Results:

In streptozotocin treated group (Group II) significantly elevated (P<0.001) serum glucose, serum cholesterol (P<0.05), serum TG (P<0.01) 0n day 22 were found. The pancreatic reduced glutathione concentrations (GSH) were significantly (P<0.001) lowered compared to those of the control alues (Table II).Treatment by n-Hexane extract of nigella (H) alone showed no change in blood sugar concentration from the control values but serum TG and serum cholesterol were significantly (P<0.001) reduced; the pancreatic reduced glutathione concentration was significantly (P<0.001) elevated.
Blood sugar concentrations in the (H+STZ) and (STZ+H) groups were near to those of the control values and serum TG concentrations were reduced below the control values. But (STZ+H) group showed more reduction in these parameters (blood sugar concentrations and serum TG) than the H+STZ group and the reduction was statistically significant.

Serum cholesterol concentrations of the (H+STZ) treated group remained nearly at the level of the STZ group suggesting no alleviation in this parameter whereas the (STZ+H) treated group demonstrated values similar to those of the control group (Table II).

Table II: Biochemical findings of the experimental groups;

	I (C)	II (STZ)	III (H)	IV (H+STZ)	V (STZ+H)
Serum glucose (mmol/l)	5.32±0.45	9.70±0.47***	5.57±0.07^{NS}	5.89±0.17***	5.12±0.02***
Pancreatic GSH (mg/gm of protein)	1.85±0.01	0.88±0.01***	3.29±0.06***	1.69±0.03**	1.08±0.03**
Serum TG (mg/dl)	160.29±1.95	208.21±2.62***	118.00±2.08***	81.92±1.83**	78.40±2.91***
Total cholesterol (mg/dl)	143.03±0.91	169.33±1.70***	121.21±3.2**	166.67±1.40	142.67±1.70**

NS=Indicates no significant difference; P<0.01=*; P<0.05=***

Discussion:

The induction of diabetes mellitus in adult male rats in the present study was carried out through the administration of intraperitoneal (i.p) streptozotocin (STZ) (50 mg/kg body wt/rat) single dose administration.

Here the aim is to observe the difference in the alleviating effect of pre and concomitantly administered n-hexane extract of nigella in diabetic rats. Before proceeding further, we needed to know what effects the n-Hexane extract would produce in the absence of diabetes mellitus in normal rats prior to induction of diabetes mellitus.

The results did not demonstrate significant difference of blood sugar concentrations between the control group of rats (Group-I) and those of the n-hexane extract treated group (H) (Table-2). These findings would suggest that n-Hexane extract of nigella would produce no effect upon resting blood sugar concentrations.

The pancreatic reduced glutathione concentrations of Group III (H) were at a significantly higher level compared to those of Group-I (Control group). This would suggest that nigella possibly was responsible for this elevation. Although how this was obtained was not clear; it might be due to the fact that nigella either cause inhibition of enzymes responsible for GSH degradation or nigella may stimulate enzymes responsible for GSH synthesis [8].

The serum glucose concentrations of the pre and concomitantly administered n-Hexane extract treated diabetic rats were significantly lower than that of the STZ treated diabetic rat group (STZ-control). The pancreatic glutathione concentration were

found significantly increased compared to the STZ treated diabetic rats and the serum TG and cholesterol concentrations were significantly lowered in comparison to the STZ treated diabetic rat group (STZ). In this experiment concomitant administration of n-Hexane extract of Nigella found comparatively more effective than preadministration. The changes in the parameters (in %) were more found in concomitantly treated groups and the differences were statistically significant.

NS was confirmed to exert an important insulinotropic effect on pancreatic β-cells and was also found to have significant insulin-like effects in peripheral tissues, namely the stimulation of basal glucose uptake in skeletal muscle cells and adipocytes[9].

Decrease in serum TG and serum cholesterol levels ($P<0.001$) were also noticed in the above mentioned groups than that of the STZ-control.

Conclusion:

In conclusion the experimental findings suggested that administration of Nigella Sativa, at a safe dose level, suppresses STZ induced diabetes in the rat. Nigella Sativa seed extracts exhibited significant hypoglycaemic and hypolipidaemic effects. Nigella sativa treatment may indicate its usefulness as a potential treatment in diabetic patients, our results suggested that n-Hexane extract of Nigella Sativa has beneficial effect on blood glucose level and ameliorative effect on regeneration of pancreatic islets and may be used as a therapeutic agent in the management of diabetes mellitus.

It is suggested that n-Hexane extract contains the property or ingredients to alleviate diabetes mellitus and its associated biochemical and histological changes in the rat. It is also suggested that concomitant administration of n-Hexane extract with streptozotocin produced better alleviations of diabetes mellitus compared to pre administration. The alleviating effect of nigella is better exerted. Future works may compare the effects of nigella with presently available standard drugs upon diabetes mellitus. The effects from one or two standard drug treated groups would have produce nicer comparison with the present findings, but were unfortunately not included due to time constraints. We suggest such comparisons in future studies together with HPLC-separation of the active componenets from crude nigella or ots n-Hexane extract.

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Original Article

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Efficacy of Color Doppler Ultrasonography in Discrimination of Benign and Malignant Breast Mass Compared to Histopathological Findings.

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Abstract:

In Bangladesh remarkable increase of breast cancer has occurred in recent years. National Institute of cancer research from 1996 to 2000 showed cervical cancer ranked 1st and breast cancer ranked 2nd. The management of patients with carcinoma breast can be improved if a definitive diagnosis is obtained preoperatively by radiological examination and /or needle biopsy/ cytology. Early detection of breast cancer offers an important prospect of improving the outcome of disease. Ultrasound is a popular imaging modality for its safety and low cost. The aim of this study was to evaluate the role of colour- Doppler sonography to predict the benign or malignant nature of breast lesions. For this purpose a total number of 60 patients having solid lesions in the breast were enrolled in the study. Doppler sonographic examination including measurement of resistive index (RI) of intralesional vessels was performed. The following observations and results were obtained in this study. Colour Doppler ultrasonogram detected 16 cases as malignant and 44 cases as benign. Among which 14 cases found truly malignant (true +ve) and 2 (two) case were found benign (false +ve) as confirmed by histopathology; while of the 44 benign cases (CDU diagnosis), 1 (one) was found malignant (false-ve) which was confirmed by histopathology and 43 cases was found benign (true -ve) as detected by histopathology. So, finally 15 cases were diagnosed malignant and 45 cases were benign. Resistive index (RI) detected 16 cases as malignant and 44 cases as benign. Among which 13 cases found truly malignant (true +ve) and 3 (two) case were found benign (false +ve) as confirmed by histopathology. In the present study, using the formula for compiling different components of accuracy test, it was found sensitivity of color Doppler US who had malignant breast mass was 93.3% and specificity was 95.6%. The positive and negative predictive values of US were 87.5% and 97.7% respectively. The diagnostic accuracy was 95.0%. The sensitivity, specificity, positive and negetive predictive values and accuracy of color Doppler US for diagnosing benign breast mass was 95.5%, 93.3%, 97.7%, 87.5%,95.0% respectively. Doppler sonography offers one possible method for investigation of patients with solid breast mass.

Keywords: Breast cancer, Doppler ultrasound, Resistive index (RI), Histopathology

Introduction:

Each year, about 1,86,000 new cases of breast cancer are reported in the United States, and about 46,000 deaths are attributed to this disease[1]in attempt to reduce this mortality, cancer societies and health care organizations have launched an extensive media campaign, causing women to practice breast self-examination and undergo periodic screening. Thus, public awareness of the potential benefits of early detection of breast cancer has increased dramatically in recent years, and more women are now seeking the advice of a physician immediately after detecting a breast mass. Consequently, surgeons are performing an ever increasing number of breast biopsies, with the vast majority of these revealing benign findings on histopathologic examination[2] Therefore, alternative, less invasive methods of distinguishing malignant from benign masses of the

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breast are needed to reduce the number of unnecessary biopsies, allay anxiety, and control costs.

Another potentially useful means of distinguishing benign from malignant masses of the breast is color Doppler sonography[3,] an application that is based on the observation that malignant masses often are associated with increased vascularity in comparison to benign lesions[4] Lesions of the breast are mainly confined to the female. In female complex breast structure and extreme sensitivity to endocrine influences predispose to a number of pathologic conditions. Breast carcinoma is the most common cancer among women between 40 to 55 years of age. The breast carcinoma most commonly occur in women with a positive family history than general population[5] The role of color Doppler Ultrasonography in breast imaging is a subject of ongoing discussion. Improvement in color Doppler ultrasound technology have recently suggested that breast ultrasound is of value in distinguishing malignant from benign masses[6] Color Doppler Ultransonogram (US) is inexpensive, quick, reliable, non-invasive, real time image, non-ionizing and is an excellent initial investigation. It is particularly useful in young women with dense breast in whom mammograms are difficult to interpret, it can also be used to localize impalpable breast lumps[5].

If breast cancer is detected & treated while it is still confined to the breast duct (DCIS: Ductal carcinoma in situ), the cure rate is close to 100%.. The potential benefits of vigorous US of both breasts and axillae include accurate assessment of size and demonstration of multiple tumour foci, soft tissue masses (indicating invasion) and abnormal lymph demonstration of multiple tumour foci, soft tissue masses (indicating invasion) and abnormal lymphnode. Thus breast color Doppler US has a role not only in the diagnosis, but also in the staging of local and regional disease[5] .

Although the sonographic patterns of benign and malignant solid masses will always overlap, the improved spatial and contrast resolution of modern high-frequency transducers allow better differentiation of these lesions. The uses of high frequency transducers, geometric analysis of the tumours and real time color Doppler US can be expected to distinguish between benign and malignant solid breast masses and to reduce the need for surgical excision in selected case[6].

They also showed that color Doppler US is not only a useful tool for differentiation of cystic from solid nodules, but also high-resolution US of the breast can successfully help to distinguish many benign from malignant solid nodules. In a study it is shown that US has 91.66% sensitivity for the detection of invasive malignancy in clinically benign masses. This is almost similar to the sensitivity of cytology and core biopsy in differentiation of benign from malignant masses. This result indicates that US is highly specific and sensitive in the detection of invasive malignancy in patients presenting with clinically benign lumps[7].

In Bangladesh US is being used for last few years in the detection of breast masses. So, this study is designed to compare the result with that of previous studies to find out whether any significant difference exists, and to assess the overall diagnostic accuracy of breast color Doppler US and its real diagnostic contribution as an adjunct to palpation and aspiration cytology. The result of this study will focus a new approach to reduce the frequency of unnecessary biopsies.

Methodology:

It was a cross-sectional type of study. This study was carried out in the Department of Radiology and Imaging, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh in collaboration with the Department of Surgery and Pathology of the same hospital from July 2011 to June 2013. Adult patients, clinically suspected as having breast mass, referred to the Department of Radiology & Imaging and Surgery, BSMMU, either by out patient department or in patient of the same hospital during the study period were selected for the study. Inclusion criteria were patients

having clinically suspected breast mass, patients who went for surgery and histopathological examination and patients willing to participate in the study. Sample size was determined by power analysis for a single proportion.

Procedures:

Written informed consent was taken from all patients. After taking informed consent the following data was collected from each patient: the history, the findings of clinical examination including the bimanual breast examination and ultrasonographic report regarding site, size, vascularity. The Color Doppler ultrasonography of the breast was done in the supine position. The interpretation of the films was done by an experienced radiologist. All patients will undergo excision of the mass lesion. Histopathological slides were prepared and examined in the department of Pathology of BSMMU. Histotopathological slides were interpreted by an experienced pathologist in the department of pathology, BSMMU. Data was collected in a pre-tested questionnaire by taking history, examining the patients clinically, the finding and interpretation of the Color Doppler Ultrasonography. Histopathological diagnosis was considered as gold standard of diagnostic criteria. The data was collected by the researcher herself.

Data Analysis:

All the collected data was compiled and tabulated on master sheet.These data were analysed statistically by standard procedure to arrive at definitive conclution in respect of the hypothesis.The data was expressed as frequency, percentage, mean (±SD) and range. Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV), positive likelihood ratio and negative likelihood ratio was calculated for Color Doppler Ultrasonography using histopathological diagnosis as a gold standard of diagnostic criteria. Statistical package for social science (SPSS) version 16.0, a computer based software was used for all data entry and statistical analysis.

A provisional Ultrasonographic diagnosis regarding the etiology of the breast lesion was made based on following high resolution and color Doppler sonography,

Table-1: Differences between benign & malignant breast mass on US

Ultrasound criterion	Benign	Malignant
High Resolution Ultrasonography features		
Size	≤ 3cm	> 3 cm
Internal echogenicity	Homogeneously hypo-echoic	Heterogeneous Hyperechoic
Margin	Regular	Irregular
Color Doppler study features		
Vascular distribution Pattern	Central	Peripheral or Mixed
Resistive Index (RI)	RI < 0.7	RI ≥ 0.7

Results:

This study was done to evaluate of benign and malignant breast mass by Color Doppler Ultrasonography and diagnosis of breast mass by histopathology and also evaluated the diagnostic efficacy of Color Doppler Ultrasonography for the diagnosis of benign and malignant breast mass in comparison to the histopathological findings. In figure 1 there shows among 60 patients, 48 (80%) patients have the lesion with size < 3 cm. On the other hand table 2 shows 27 (45%) patients have the lesion which is located on the upper and outer quadrant of the breast. The margin of the lesion is regular in 42 (70%) patients as shown in table 3 and internal echocity is hypoechoic in 38 patients (63.3%) as shown in table 4. In table-5 and 6 there shows cacification occurred in 17 (28.3%) patient and 11(18.3%) patient suffering with associate lymhadenopathy.

Color Doppler identified 16 malignant cases, out of which 14 (93.3%) (table 9) cases were evaluated as malignant and 2 (4.4%) as benign. On Histopathological examination there found 15 cases

are malignant and 45 patients are benign (table- 9). Among 15 cases 13 patients are suffering from invasive ductal carcinoma (86.6%) (table-10). Among 45 cases 36 (80%) patients suffering from fibroadenoma (table-11).

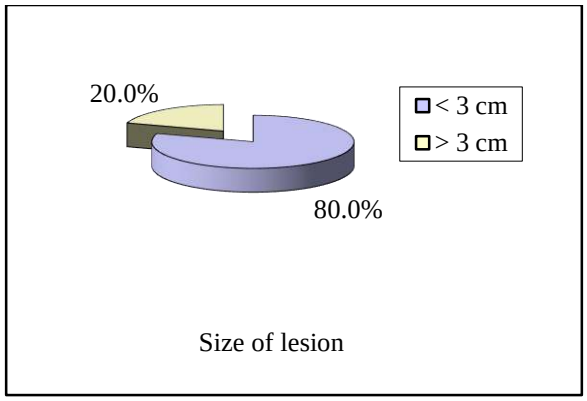


Figure 1: Pie chart showing size of lesion

Table 2: Distribution of the patients by location of the lesion (N=60)

Location of the lesion	Number of patients	Percentage
Upper outer	27	45.0
Upper inner	12	20.0
Lower inner	8	13.3
Lower outer	6	10.0
Central	6	10.0
Upper outer + Central	1	1.7

Table 3: Distribution of the patients by margin (n=60)

Margin	Number of patients	Percentage
Regular	42	70.0
Irregular	18	30.0

Table 4: Distribution of the patients by internal echogenicty (N=60)

Internal echogenicty	Number of patients	Percentage
Hypoechoic	38	63.3
Hyper echoic	6	10.0
Heterogonous	16	26.7

Table 5 : Distribution of the patients by calcification (N=60)

Calcification	Number of patients	Percentage
Present	17	28.3
Absent	43	71.7

Table 6: Distribution of the patients by associated lymphadenopathy (N=60)

Associated lymphadenopathy	Number of patients	Percentage
Present	11	18.3
Absent	49	81.7

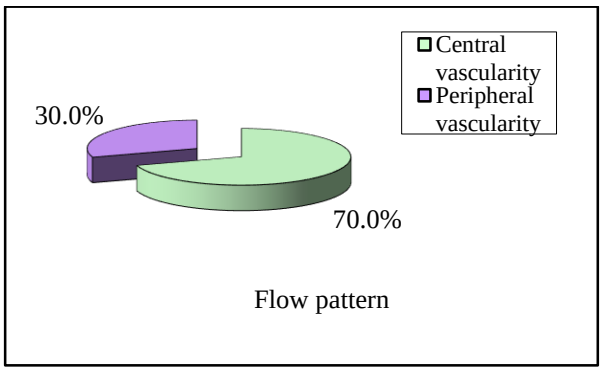


Figure 03: Pie chart showing flow pattern of the study patients

Table 7: Distribution of the patients by resistivity index in color Doppler ultrasonography (N=60)

Resistivity index	Number of patients	Percentage
Resistive index <0.7	44	73.3
Resistive index ≥0.7	16	26.7

Table 8: Distribution of the studied patients by color Doppler ulrasonographic evaluation (N=60).

Color Doppler	Number of patients	Percentage
Malignant	16	26.7
Benign	44	73.3

Table 9: Distribution of patients by histopathologic evaluation (N=60).

Histopathology examination	Number of patients	Percentage
Malignant	15	25.0
B		75.0

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Table 10: Histopathological results for 15 malignant cases

Histological diagnosis	n	percentage
Invasive ductal carcinoma	13	86.6
Ductal carcinoma in situ	1	6.6
Lobular carcinoma	1	6.6

Table 11: Histopathological results for 45 benign cases

Histological diagnosis	n	percentage
Fibroadenoma	36	80
Abscess	5	11.1
Fibrocystic change	2	4.4
Phyllodes tumor	1	2.2
Lipoma	1	2.2

Discussion:

Color Doppler ultrasonography is the modality that is most commonly used to evaluate pathological conditions of breast lesions. It has improved substantially the clinical evaluation of breast lesions. This cross-sectional type of study was done to evaluate of benign and malignant breast mass by Color Doppler Ultrasonography and diagnosis of breast mass by histopathology and also evaluated the diagnostic efficacy of Color Doppler Ultrasonography for the diagnosis of benign and malignant breast mass in comparison to the histopathological findings.

A total number of 65 patients clinically suspected as having breast mass who came in department of Radiology and Imaging, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during the period of July 2011 to June 2013, were included in this study. Two patients did not undergo surgery, and three patients had no histopathological reports. Therefore, a total of 60 patients finally enrolled in this study. The present study findings were discussed and compared with previously published relevant studies.

Experience shows colour Doppler ultrasonography can increase the confidence of conventional

sonography in differentiating between benign and malignant breast lesions. The fact that malignant breast tumors often have a higher blood flow than benign lesions which is used as a diagnostic purpose. This difference is based on the neovascularization of malignant neoplasms. In the initial study presented above, the sonographic findings were compared with the postoperative findings characterizing the biological behavior of breast carcinomas. Although this research is still preliminary, a remarkably high correlation was observed between minimal blood flow detected at ultrasound and the absence of axillary lymphnode metastasis. Even in patients with moderate flow, metastasic lymphnode involvement was present in two-thirds of the cases. It appears that a definite relationship exists between the level of blood flow in a malignant tumor and the presence of lymph node metastasis.

Breast lesion is one of the most common surgical problem of female population in the world as well as in Bangladesh. The mortality rate of carcinoma of the breast has remained unchanged for the last 60 years. Although recently there has been little success in preventing breast cancer, significant reduction of mortality could be achieved by early detection. Color Doppler ultrasonography of breast playing a pivotal role in this regard and ultrasonography of the breast can successfully help distinguishing many benign from malignant solid nodules and thus many unnecessary biopsy can be avoided.

In the current study of the age, a total of 60 patients were included in this study, it was observed that almost half (48.3%) patients were age belonged to 16-30 years. The mean age was found 33.4±7.2 years with range from 16 to 60 years. This study is consistent with the study where the malignant cases were 6.46% at or below 40 years and 93.5% were above 40 years of age[2] (here it is remarkable that the age range was 14-93 years). In the present study the size of the tumour varied from 0.5 cm to 8.0 cm of which 80.0% had 3 or <3 cm in size and 20.0 % had >3cm in size. In the study of Yong the size of the masses were 0.4 to 8.0 cm.

In this current study about 45.0% of tumors were located in the upper outer, 20.0% in the upper inner, 13.3% in the lower inner, 10.0% in the lower outer and 11.% in the central part. Rusell et al., documented that 72.0% of malignant tumors in the breast located into the upper (upper outer 60% and upper inner 12% quadrant), which is consistent with the present study.

In this study, 30.0% of tumors had irregular margins, 63.3% were hypoechoic, 10.0% hyper echoic and 26.7% hyperechoic; 28.3% had evidence of calcification. Similarly, obtained that 28.0% had irregular margins, 69% hypoechoic 3% isoechoic, 2.3% hyperechoic[2]. Regarding calcification the study identified 23% of calcification[2]. The above findings are comparable with the current study.

In this present study it was observed that associated lymphadenopathy present in 18.3% and 81.7% had no associated lymphadenopathy. About the flow pattern, central vascularity was found in 70.0% and peripheral vascularity 30.0%. Resistivity index <0.7 was 73.3% and ≥0.7 resistive index was 26.7%.

In the present study, based on color Doppler ultrasonographic findings 26.7% were diagnosed as malignant and 73.3% as benign masses. In comparison 15(25.0%) were detected as malignant and 45(75.0%) were diagnosed as benign masses in histopathology. Similarly, in another study there found 83% histopathologically benign and 17% malignant masses, which is comparable with the current study[8].

In this current series it was observed that 13 (81.25%) cases had size of lesion >3 and 3(18.75%) had <3 cm in malignant case. In benign case, 35(79.55%) had size of lesion <3 cm and 9(20.45)% had >3 cm size of lesion. Irregular margin was found 15(93.8%) and 3(6.8%) in malignant and benign cases respectively.

In this present series it was observed that hypoechoic lesion was found 2(12.5%) in malignant cases and 36(81.8%) in benign cases. Hyperechoic lesion was 1(6.3%) in malignant case, 5(11.4%) in benign cases.

Heterogonous was 13(81.3%) in malignant cases and 3(6.8%) in benign cases. Calcification was found 68.0% of malignant cases and 13.63% of benign cases. Associated lymphadenopathy was found 9(56.3%) in malignant cases and 2(4.5%) in benign cases.

In the present study, using the formula for compiling different components of accuracy test, it was found sensitivity of color Doppler US who had malignant breast mass was 93.3% and specificity was 95.6%. The positive and negative predictive values and accuracy of color Doppler US were 87.5%, 97.7% and 95% respectively.The sensitivity, specificity, positive and negetive predictive values of color Doppler US for diagnosing benign breast mass was 95.5%, 93.3%, 97.7%, 87.5% respectively.The diagnostic accuracy of US in differentiating breast mass into malignant and benign was 95.0%. Color Doppler US sensitivity, specificity and positive predictive values were 67.6%, 97.7% and 81.0% respectively[2]. The above results indicate that color Doppler US is highly specific and sensitive in the differentiation of malignant and benign breast masses. The current study focuses that color Doppler Ultrasonography of the breast is very useful method in the differentiation between benign and malignant breast masses.

In another study where we observed mean value of the resistance index (RI) was 0.7 for malignant lesions[9]. The result of the present study, closely agree with these investigators.

From the results of the present study, it was conceived that none of the benign lesions displayed an RI value greater than 0.7 and values higher than this favored the diagnosis of a malignancy. It thus could be concluded that color Doppler imaging along with measurement of resistance index is one of the accurate diagnostic imaging tool for pre-operative discrimination of benign and malignant solid lesions of breast. However, further studies would be required to determine the usefulness of this modality.

Summary:

A definitive pre-operative diagnosis of breast mass can help the surgeon decide about the plan of surgery. An assurance of benignity where appropriate, alleviates the patient's anxiety, and when it is malignant, immediate and appropriate plan of treatment can be taken to decrease morbidity and mortality. This cross sectional study was carried out in the department of Radiology and Imaging, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during the period of July 2011 to June 2013. The purpose of this study was to evaluate the diagnostic efficacy of Color Doppler ultrasonography in the diagnosis of benign and malignant breast mass.

For this purpose a total number of 60 patients having solid lesions in the breast were enrolled in the study. Doppler sonographic examination including measurement of resistive index (RI) of intralesional vessels was performed. The following observations and results were obtained in this study.

Colour Doppler ultrasonogram detected 16 cases as malignant and 44 cases as benign. Among which 14 cases found truly malignant (true +ve) and 2 (two) case were found benign (false +ve) as confirmed by histopathology; while of the 44 benign cases (CDU diagnosis), 1 (one) was found malignant (false-ve) which was confirmed by histopathology and 43 cases was found benign (true -ve) as detected by histopathology. So, finally 15 cases were diagnosed malignant and 45 cases were benign.

Resistive index (RI) detected 16 cases as malignant and 44 cases as benign. Among which 13 cases found truly malignant (true +ve) and 3 (two) case were found benign (false +ve) as confirmed by histopathology; while of the 44 benign cases (CDU diagnosis), 2 (two) were found malignant (false-ve) which was confirmed by histopathology and 42 cases was found benign (true -ve) as detected by histopathology. So, finally 15 cases were diagnosed malignant and 45 cases were benign.

In the present study, using the formula for compiling different components of accuracy test, it was found sensitivity of color Doppler US who had malignant breast mass was 93.3% and specificity was 95.6%. The positive and negative predictive values of US were 87.5% and 97.7% respectively. The diagnostic accuracy was 95.0%.

The sensitivity, specificity, positive and negative predictive values and accuracy of color Doppler US for diagnosing benign breast mass was 95.5%, 93.3%, 97.7%, 87.5%,95.0% respectively.

For malignant cases maximum number were from 4^{th} through 5^{th} decade and for benign cases maximum number were found from 2^{nd} through 3^{rd} decade. The tumors were found more frequently in the left then in the right breast.

The potential reduction in the need for biopsy , the morbidity associated with the biopsy procedure, including the lost time, from work or other activities that occur as a result of biopsy, particularly excisional biopsy, could markedly be reduced as a result of sonographic classification of solid breast mass as benign.

13 (81.25%) cases had size of lesion >3 and 3(18.75%) had <3 cm in malignant case. In benign case, 35(79.55%) had size of lesion <3 cm and 9(20.45)% had >3 cm size of lesion. Regular margin cases was found in 1 malignant case and 41(93.2%) in benign cases.

In malignant cases majority 81.3% patients had heterogonous echotexture and in benign cases 81.8% patients had hypoechoic lesion. Calcification was found in 11 (68.8%) malignant cases and 6 benign cases.

Associated lymphadenopathy was found in 9 (56.3%) in malignant cases and 2(4.5%) benign cases.

Color Doppler identified 16 malignant cases, out of which 14 (93.3%) malignant cases and 2 (4.4%) benign cases evaluated by histopathology.

Conclusion & Recommendation:

It can be concluded that colour Doppler Ultrasonography is a useful method in the differentiation between benign and malignant breast masses. Colour Doppler imaging with measurement of resistive index (RI) has higher sensitivity and accuracy. A resistive index >0.7 is highly suspicious for malignancy. To see vascularity of the lesions, multiplicity of mass, architectural distortion, morphological characterization, calcification and encapsulation are best seen in ultrasonography and there by helping surgeon for operative plan and decreases patient's morbidity and mortality.

However, further research on this subject should be encouraged on large number of patients.

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Original Article

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Ischemia Modified Albumin Use in the Diagnosis and Prognosis during Treatment of Patients with Unstable Angina and Non ST and ST Elevation Myocardial Infarction

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Abstract:

Background: While most cardiac biomarkers are negative in acute myocardial ischemia, measurement of ischemia modified albumin (IMA) can be useful in detecting early phases of ischemic heart disease. Objective: This study evaluates the usefulness of IMA in differentiation and prognosis of patients presenting with unstable angina, non-ST elevation (NSTEMI) and ST elevation myocardial infarction (STEMI). Methods: Total 58 patients with myocardial ischemia were subdivided into 3 groups: unstable angina, NSTEMI, and STEMI patients. Control group consisted of 27 healthy subjects. Blood samples were collected on admission before starting therapeutic intervention, after 24 hours and 96 hours of treatment to measure serum IMA and cardiac troponin I (cTnI)levels. Results: IMA levels were significantly higher in unstable angina (p=0.002), NSTEMI (p<0.0001) and STEMI (p<0.0001) patients when compared to healthy control at baseline. In patients with unstable angina, there was no significant or consistent change in IMA levels after 24 and 96 hours of treatment. There was significant reduction in IMA levels after 24 hours (p=0.0025) and 96 hours (p=0.0186) in NSTEMI and after 24 hours (p<0.0001) and 96 hours (p=0.0008) in STEMI patients. However IMA level after 96 hours did not reach the control value. In this study, we found negative correlation between IMA and cTnI in case of NSTEMI and positive correlation in case of STEMI patients. However, the correlation was not significant. Conclusion: IMA could be an important biomarker for the diagnosis of unstable angina and could be useful as a prognostic marker during treatment in patients with STEMI and NSTEMI.

Keywords: Myocardial ischemia, ischemia modified albumin, unstable angina, ST elevation myocardial infarction, non-ST elevation myocardial infarction.

Introduction:

The diagnosis of acute cardiac ischemia relies on the combination of chest pain, ECG changes and serum marker elevation. However, symptoms may be nonspecific in up to one-third of chest pain patients, and the ECG misses up to 50% of the patients who have had an acute myocardial ischemia (AMI)[1,2,3]. Currently, troponin is the standard biomarker for myocardial injury and is used commonly in conjunction with creatine kinase MB (CK-MB) and myoglobin to enable a more rapid diagnosis of acute coronary syndrome[4]. But, the cardiac biomarkers, in the absence of necrosis, provide no reliable information when measured in the first 2-6 hours following an ischemic event [5]and they do not rise in the blood with reversible ischemia[6].

Unlike myocardial necrosis, there is no accepted cardiac biomarker for ischemia. Although a number of new cardiac marker strategies (e.g. free fatty acids, choline) [7] have been developed, to date only one has been recommended for the clinical validation test: ischemia modified albumin[8]. An elevated concentration of IMA has been proposed as a marker of myocardial ischemic injury. This assay is reported to be positive within 6-10 minutes of ischemia and

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remains so for up to 6 hours later, allowing detection before the development of myocardial necrosis as evidenced by normal levels of CK-MB, troponin and myoglobin[9,10,11]. IMA was shown to be a valuable prognostic marker in the clinical setting of NSTEMI patients[12].

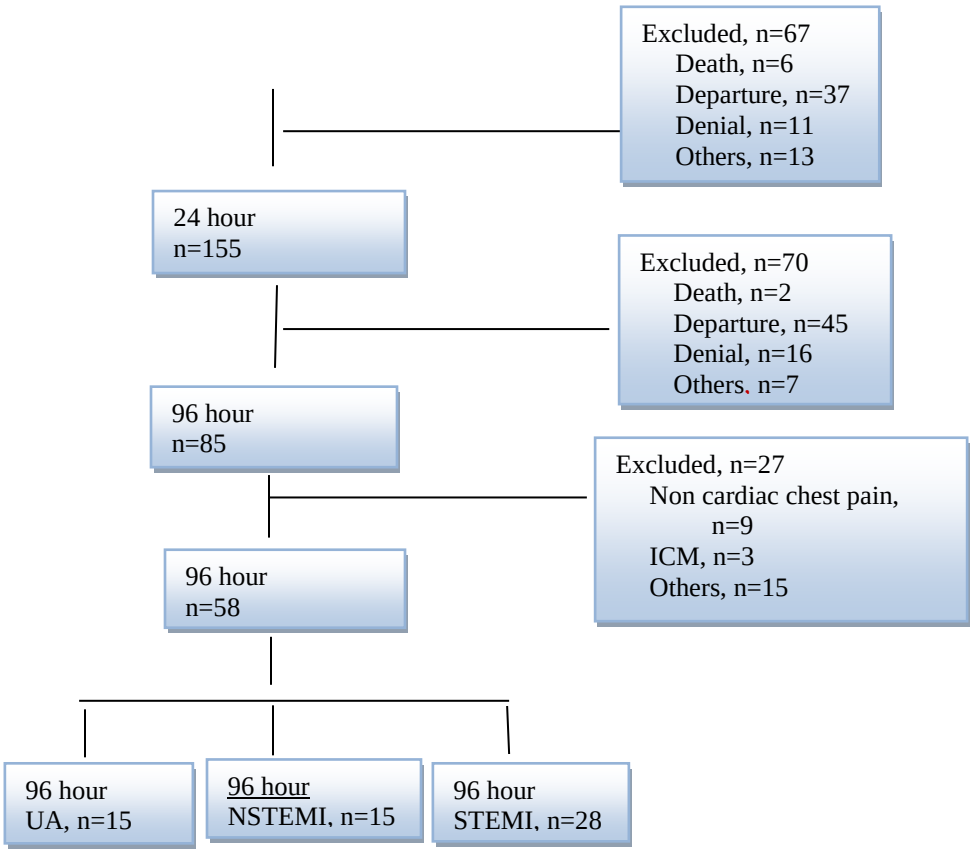
In this study we have intended to examine the usefulness of IMA in differentiation of patients presenting with unstable angina, NSTEMI and STEMI and also to evaluate the relationship between IMA and cTnI levels in patients with IHD.

Materials and Methods:

This study was conducted in the Department of Pharmacology, BSMMU, Dhaka in the period of March 2012 to August 2013. Samples were recruited from the National Heart Foundation Hospital and Research Institute (NHFH&RI), Dhaka. The study was funded by University Grants Commission (UGC), Bangladesh.

Sample Population:

A total of 222 patients, admitted to hospital with prolonged (>20 min) retrosternal chest pain radiating to the neck and/or left shoulder were enrolled for the study. However, 137 patients were to be excluded due to early departure from the hospital, deaths and noncooperation. Another 27 patients were excluded as the discharge diagnosis did not comply with myocardial ischemia. Therefore, the final study was performed on 58 patients, aged between 25 and 85 years. Patients with pathological q wave, acute renal failure, abnormal liver function, peripheral vascular disease, or cerebrovascular disease, and pregnant and nursing women were excluded. 27 healthy subjects were taken as controls. Acute chest pain, diabetes mellitus, hypertension, and history of ischemic heart disease were exclusion criteria for the controls. Informed written consent was taken from each patient. All patients received standard routine medical therapy throughout the study.



Study Design:

The study was designed to evaluate IMA level in two distinct human populations: patients with acute chest pain and evidence of early myocardial ischemia (Group I), and a control group (Group II) with no subsequent evidence of myocardial ischemia. The study group comprised three subgroups according to their discharge diagnosis:

Group 1a: Patients with unstable angina, troponin level not elevated

Group 1b: Patients with non ST elevation myocardial infarction, troponin level elevated

Group 1c: Patients with ST elevation myocardial infarction, troponin level elevated

Serum samples were collected from the patients on three occasions: at 0 hour (baseline, before treatment) on admission, 24±2 hours after treatment had been started and 96±2 hours after treatment. From the controls only one sample at 0 hour (baseline) was collected.

Blood was collected in a test tube by venipuncture and was allowed to clot for 30 to 90 minutes and serum was separated after centrifugation at 3000 rpm for 10 minutes. Samples were stored in labeled Eppendorf's at -20^{o}C until IMA analysis.

Routine Diagnostic Procedures:

At the emergency department (ED) and in the coronary care unit (CCU), routine procedures comprised of: establishing the time of onset of symptoms as accurately as possible, a general patient history, clinical examination, 12-lead ECG, and the laboratory tests. Practice guidelines for the Redefinition of AMI[13] and the Management of Patients with Unstable Angina and NSTEMI[14] were used to diagnose the patients with unstable angina, NSTEMI and STEMI.

Cardiac Markers:

Ischemia-modified albumin was determined from serum with the albumin cobalt binding (ACB) test. A reference level was previously determined from a control reference population of 27 healthy subjects. Cardiac troponin I (cTnI) was determined from serum by Automated Immunoassay Analyzer. The upper reference value for cTnI was 0.1ng/ml.

Medical Therapy:

On arrival, Glyceryl trinitrate sublingually and 300 mg of aspirin was administered to all patients (thereafter 75 mg once daily). If the ECG showed ST depressions, T-wave inversions, or other signs that increased the likelihood of myocardial ischemia, the physician on duty administered heparin (intravenous heparin, 5000 IU) and clopidogrel (300 mg bolus, then 75 mg once daily). Low molecular weight heparin (enoxaparin, 1 mg/kg body weight 12 hourly) was instituted thereafter and maintained for 5 days. If the ECG showed ST elevation, diagnosis of STEMI was confirmed and thrombolytic (streptokinase 1.5 million unit once) was given if the patient came within 6 hours of chest pain; enoxaparin and clopidogrel were administered as described above if patients came after 6 hours. Otherwise, results of troponin I analysis were awaited.

Statistical Analysis:

Statistical analysis was done by SPSS, Version 17.0. Unpaired t-test, paired t-test, and ANOVA followed by Bon Ferroni t test have been evaluated. The interrelationship of the variables (IMA and cTnI) was tested using Pearson's correlation coefficient. The level of significance had been set at p value less than 0.05.

Results:

Demographic Characteristics of Control and Study Group.

The demographic data and clinical characteristics of the control and study group are shown in table I.

Table I: Baseline characteristics of unstable angina, NSTEMI and STEMI patients and control subjects

Characteristics	Control n = 27	Unstable angina n = 15	NSTEMI n = 15	STEMI n = 28
Age, years (mean±SD)	42.15 ± 14.78	61.27 ± 12.31	54.8 ± 12.25	48.96 ± 10.38
Sex, Male/Female(%)	20/7 (74.07%/13.92%)	7/8 (46.67%/53.33%)	10/5 (66.67%/33.33%)	26/2 (92.86%/7.14%)
Hypertension (%)	0 (0%)	13 (86.67%)	9 (60%)	11 (39.29%)
Diabetes mellitus (%)	0 (0%)	8 (53.33%)	5 (33.33%)	10 (35.71%)
Smoking (%)				
Current smoker	4 (14.81%)	1 (6.6%)	2 (13.33%)	14 (50%)
Ex-smoker	0 (0%)	1 (6.6%)	1 (6.6%)	4 (14.28%)
Serum Lipid profile mg/dl, mean±SD				
Total cholesterol	175.77±44.43	146.17±33.49*	174.75±49.72	161.26±40.31
HDL-C	36.84±14.87	34.79±13.49	37.04±19.57	38.35±15.59
Serum albumin, g/dl, mean ± SD	5.19±0.15	4.49±0.36	4.74±0.71	4.39±0.99
Previous history of IHD, (%)	0 (0%)	9 (60%)	10 (66.67%)	6 (21.43%)

Data are expressed as mean ± SD or number (%), UA - unstable angina, NSTEMI - non ST elevation myocardial infarction, STEMI - ST elevation myocardial infarction, IHD - ischemic heart disease, *- p value <0.05

Serum IMA and cTnI levels in control and in patients with unstable angina, NSTEMI and STEMI at baseline and after 24 and 96 hours of treatment

At baseline, serum IMA level was significantly higher in unstable angina patients (p = 0.002), in NSTEMI patients (p <0.0001) and in STEMI patients (p <0.0001) when compared with healthy control. There were no significant differences in IMA levels between unstable angina, NSTEMI, and STEMI patients. The troponin level was also significantly higher in unstable angina patients, in NSTEMI and in STEMI patients compared to healthy control. However, the level of cTnI in unstable angina patients was below the cut-off value (<0.1 ng/ml).

Table II: Serum IMA and cTnI levels in control, unstable angina, NSTEMI and STEMI patients at baseline and after treatment

Group	Biomarkers	At baseline (0 hour)		After 24 hours		After 96 hours	
		Mean±SD	P value[1]	Mean±SD	P value[2]	Mean±SD	P value[3]
Control	IMA (ABSU)	0.238± 0.058	-	-	-	-	-
	cTnI (ng/ml)	0.003±0.010	-	-	-	-	-
Unstable angina	IMA (ABSU)	0.378±0.228	0.0022	0.367±0.152	0.9772	0.378±0.158	0.8903
	cTnI (ng/ml)	0.051±0.081	0.0043	0.041±0.072	0.6544	0.014±0.030	0.1054
NSTEMI	IMA (ABSU)	0.504±0.223	0.0001	0.326±0.132	0.0025	0.384±0.163	0.0186
	cTnI(ng/ml)	4.957±6.291	0.0002	7.619±7.174	0.1385	4.524±5.649	0.8418
STEMI	IMA (ABSU)	0.431±0.196	0.0001	0.308±0.162	0.0031	0.283±0.186	0.0008
	cTnI (ng/ml)	4.799±7.653	0.0020	19.369±6.822	0.0001	15.091±7.015	0.0001

NSTEMI- non ST elevation myocardial infarction, STEMI- ST elevation myocardial infarction, ABSU– absorbance unit, ng/ml- nanogram/millileter, 1- comparison between control and 0 hour, 2 - comparison between 0 hour and 24 hours, 3 – comparison between 24 and 96 hours. Values are expressed as mean ± SD. Unpaired t test, paired t test and ANOVA followed by Bonferroni t test were done to measure the level of significance.

In patients with unstable angina, there was no significant change in IMA levels after 24 hours and 96 hours of treatment as compared to baseline level. In patients with NSTEMI, significant reduction in IMA level was observed after 24 hours ($p = 0.0025$) and after 96 hours ($p = 0.0186$) of treatment compared to baseline. However IMA level after 96 hours did not reach the control level ($p = 0.0012$). In patients with STEMI, there was significant reduction in IMA levels after 24 hours ($p < 0.0001$) and after 96 hours ($p = 0.0008$) of treatment when compared to IMA levels at baseline. However IMA level after 96 hours did not reach the control level ($p = 0.0323$). Results are shown in Table II and in Figure 2.

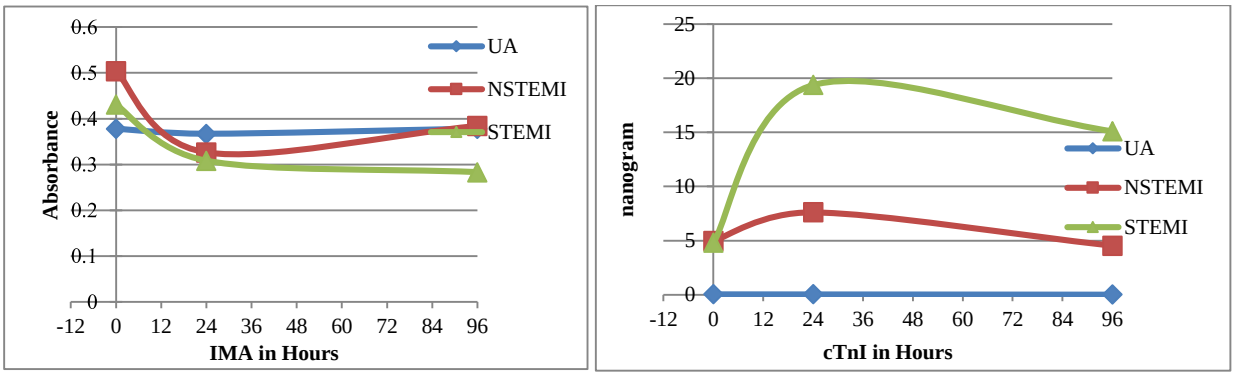


Figure 2: IMA and cTnI levels in unstable angina, NSTEMI and STEMI patients at baseline and after treatment

Relationship between IMA and cTnI levels in patients with NSTEMI and STEMI

In this study, in NSTEMI patients a negative correlation between IMA and cTnI was found at 0 hour and after 96 hours of treatment. Pearson's correlation coefficient at 0 hour was - 0.433 (p = 0.195) and after 96 hours was - 0.471 (p = 0.08) (figure 3). In STEMI patients, positive correlations between IMA and cTnI were found at 0 hour and after 96 hours of treatment. Pearson's correlation coefficient at 0 hour was 0.189 (p = 0.33) and after 96 hours was 0.087 (p = 0.38) (figure 3).

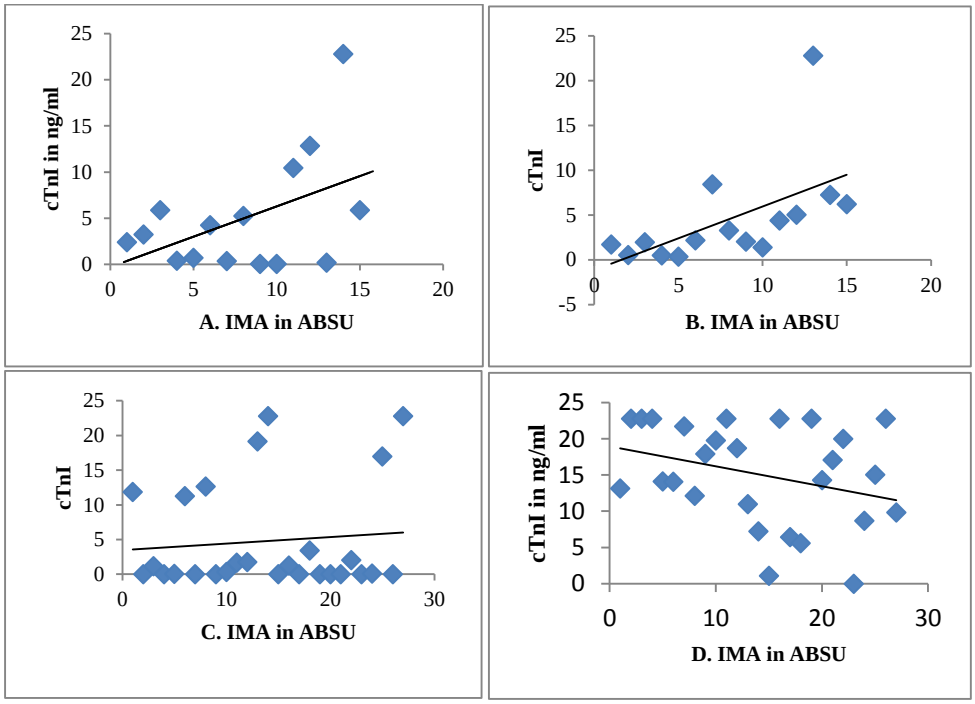


Figure 3: A. Correlation between IMA and cTnI in NSTEMI patients at 0 hour, r = - 0.433, p=0.195 and B. after 96 hours, r = - 0.471, p = 0.08; C. Correlation between IMA and cTnI in STEMI patients at 0 hour, r = 0.189, p = 0.33**;** and D. after 96 hours, r = 0.087,p=0.38

Discussion:

In the present study, our aim was to evaluate the usefulness of measuring IMA concentrations to identify acute myocardial ischemia and to differentiate between patients presenting with myocardial infarction with or without ST elevation and unstable angina. The results of our study showed that serum IMA levels at least for 6 hours from the onset of chest pain was significantly higher in unstable angina, NSTEMI and STEMI patients than healthy control subjects. However, there was no significant difference in IMA levels between unstable angina and NSTEMI patients and unstable angina versus STEMI and STEMI versus NSTEMI patients. Increase in IMA level is indicative of myocardial ischemia. IMA has been shown to be an independent predictor of acute coronary syndrome (ACS), where patients having discharge diagnosis of unstable angina did not have elevated troponin level or diagnostic change in ECG findings.

We assessed IMA levels in the patients with unstable angina, NSTEMI and STEMI on three occasions in order to find out the trend of change of IMA levels. We wanted to evaluate whether IMA value decreases after treatment assuming that IMA concentration will reach the control level if ischemia is relieved. In unstable angina patients IMA concentrations decreased after 24 hours and increased after 96 hours. However, neither of the change was significant as compared to baseline IMA level and the trend of change also was not consistent. It may be presumed that unstable angina patients come late (>6 hours) to the emergency department because of less severity of pain by which time IMA level starts to fall as we found that in unstable angina IMA level was less than that of IMA levels in STEMI or NSTEMI patients.

In this study there was a significant reduction in IMA levels after 24 and 96 hours of treatment in myocardial infarction patients with ST elevation or non ST elevation. However the level did not reach the control level and the difference was significant. However, findings of our study differ from the study of Sinha et al.[6] where they found normalization of IMA concentration after 24 hours. A likely explanation for this is that the patients in Sinha's study were post-PCI patients in whom myocardial ischemia was a consequence of temporary balloon expansion. Ischemia does not prevail post-PCI; hence IMA levels return to normal within 24 h.

In our study we measured cardiac troponin I (cTnI) level in order to find correlation between serum IMA and cTnI levels. In unstable angina cTnI levels were below reference value (<0.1ng/ml) on three occasions. These results support the evidence that IMA is an early marker of ischemia, it increases before any detectable change in cardiac troponins, and is elevated even in the absence of myocardial necrosis.Therefore IMA could be a useful marker for early detection of cardiac ischemia. We found negative correlation between IMA and cTnI in patients with NSTEMI, and positive correlation in patients with STEMI at baseline (0 h) and after 96 hours of treatment. But these correlations were not statistically significant. From these findings we can assume that IMA and cTnI are independent variables.

This study has several limitations that warrant mention. It must be noted that the ACB assay used to measure serum IMA is not specific for myocardial ischemia. Given this, it is recommended that the interpretation of a positive IMA finding should be combined with other clinical indices. Unfortunately, the ECG records for the patients described in this study were inadequate to allow for definitive analysis to be performed. Also we could not establish the pin-point time of duration of chest pain in patients which is an important factor in assessment of IMA. In case of prognosis study, we could not follow-up the patient adequately in terms of morbidity and mortality.

Conclusion:

From the findings of the present study it may be concluded that measurement of IMA concentrations may be useful in the diagnosis of unstable angina where cTnI is not elevated. However, IMA concentrations at baseline do not differentiate the patients of unstable angina from NSTEMI/STEMI or NSTEMI from STEMI. IMA level could be useful for

the assessment of myocardial ischemia during treatment in patients with STEMI and NSTEMI.

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Original Article

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Awareness Regarding Particular Aspects of Personal Hygiene among Rural Adult People in a Selected Area of Bangladesh

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Abstract:

Objective: To assess the level of awareness regarding particular aspects of personal hygiene among adult rural people of Bangladesh. Materials and Methods: This was a descriptive type of cross-sectional study. A total of 147 adult rural people of both sexes (male 92 and female 55) were selected purposively for the study and interviewed to assess the level of awareness regarding particular aspects of personal hygiene with the help of interviewer-administered questionnaires (Interview schedules). Place and Period of study: The study was conducted at Chandragram village, Bajitpur, Kishoregonj on 19 and 20 March 2014. Results: The findings of the study reflected that all the respondents (100%) were adult rural people of which 62.59% males, 37.41% females, 76.19% married and 23.81% unmarried. 19.05% respondents were quite illiterate. Occupation was mainly agriculture (34.69%) and housewife (31.98%). Monthly family income of most of them (45.58%) was within 5000–10000 taka having 5-8 family members (59.86%). 27.21% respondents used kancha latrines and still 3.40% used open field for defecation. Tube-well was the main source of drinking water for 98.64% respondents. Only 17.01% respondents took their bath with 'soap and water' daily. Majority respondents (97.28%) had their teeth brushed daily but only 5.44% of them did so three times. 39.47% respondents did not use tooth-paste and 36.05% did not cut their nails weekly. Only 16.33% washed their hair with 'soap-shampoo-water'. 60.54% respondents washed their hands with 'only water' before meal & 25.17% did so with only water after defecation. 27.21% respondents did not have any knowledge about the transmission of diseases through dirty nails and even after defecation if not hands washed properly. 19.73% respondents did not have knowledge regarding problems if not taking care of hair. 23.13% respondents went for defecation barefooted. 61.90% respondents did not have knowledge about transmission of diseases from using latrine barefooted. 15.65% did not know how to avoid obesity. 44.22% and 33.33% respondents had the habit of 'tobacco smoking' and 'betel leaf & nut' respectively. Conclusion: Some of the respondents were quite illiterate. Their occupation was mainly 'agriculture'and 'housewife'. Monthly family income of most of them was not so solvent having 5-8 family members. There found lacking in maintaining personal hygiene regarding many important particular aspects of it among rural adult people.

Keywords: Personal hygiene, knowledge, practice, adult rural people

Introduction:

Health is the quality of life that renders the individual fit to live most and serve best. But attainment and maintenance of health may not be easy in this world when lives have become so complex and the environment so hazardous. Because of improper living, the result of either ignorance or carelessness, the health of many even in the developed world is below the desired level. It is not so much the knowledge of how to live as the practice of it that so greatly contributes to a satisfactory living.[1]Although health is now recognized a fundamental human right, it is essentially an individual responsibility. It is not a commodity that one individual can bestow on another. No community or state program of health services can give health. In large measure, it has to be earned and maintained by the individual himself, who must accept a broad spectrum of responsibilities, now

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know as "self care". A recent trend in health care is self care. It is defined as "those health- generating activities that are undertaken by the persons themselves". It refers to those activities individuals undertake in promoting their own health, preventing their own disease, limiting their own illness, and restoring their own health.[2] The global burden of disease and mortality rates could be reduced by about 9.1% and 6.3% respectively, if rapid success is attained in facilitating access to water, sanitation and hygiene facilities.[3] Knowledge, Attitude, and Practice (KAP) surveys have been used in various settings to assess existing knowledge and hygiene practices relevant to prevention and transmission of diarrheal diseases, including cholera.[4,5,6] Since about 90% of infections carried to the body through mouth with water, food, finger, dirt etc. The importance of personal cleanliness and clean habit becomes at once apparent.[7] So, people should be provided with sufficient health knowledge through health education. Kaprio (1979) suggested that "health education's primary goal should be changing the social structure of any country in order to achieve a society in which each individual feels both rights and responsibilities to the health.[8] Infact responsibility for health is quite divided. State has taken over by international agencies, but still many things are left to the individual and this is known as personal hygiene. This has been defined as the personal adjustments, which must make so that he can achieve health and can also maintain it. If he can do these two his health promotion will be automatically there.[9]

It should be mentioned that knowledge regarding sanitation and personal hygiene among the rural people can save them from numerous diseases. Eye can not see what mind does not know is very much applicable in this regard.

So identification of the problems and its extent will help for making relevant policies to reduce the obstackles to the improvement of health of the rural people and this is the justification of this study.

Materials and Methods:

This was a descriptive type of cross-sectional study. This study was done to assess the level of awareness regarding particular aspects of personal hygiene among adult rural people of Bangladesh. The study was conducted at Chandragram village, Bajitpur, Kishoregonj on 19 and 20 March 2014. A total of 147 adult rural people of both sexes (male 92 and female 55) of the village were selected purposively for the study. First of all consent was taken from the respondents before information collection and they were clearly informed of the objectives of the study. They were also assured that data would be kept confidential and used only for academic and medical purposes. Then face to face interview was conducted by asking questions with the help of interviewer-administered questionnaires (Interview schedules). After compilation of data, the obtained data were checked, verified, edited and a master table was prepared. The data were then analyzed from the Master table for having results.

Results:

A total of 147 adult rural people of both sexes of which male 92(62.59%) and female 55(37.41%) and of them 112(76.19%) married and 35(23.81%) unmarried were selected purposively for the study. The findings of the study from data analysis are documented below:

A. Socio-demographic information:

Table-1: Socio-demographic information:

Variable	n (%)	Variable	n (%)
Age group in year		**Education**	
18 - 38	77 (52.38)	Illiterate	28 (19.05)
38 - 58	46 (31.30)	Below graduation	107 (72.79)
58 - 78	24 (16.32)	Graduation & above	12 (08.16)
Mean ± SD	40.79 ± 14.98	**Monthly family income (Taka)**	
Sex		<5000	05(03.40)
Male	92 (62.59)	5000-10,000	67(45.58)
Female	55 (37.41)	10000-15000	49(33.33)
Marital status		15000-20000	20(13.61)
Married	112(76.19%)	20000 & above	06(04.08)
Unmarried	35(23.81%)	Mean ± SD	11820 ± 5282
Occupation		**Family member**	
House wife	47(31.98)	2 – 5	52(35.38)
Service	12(08.16)	5 - 8	88(59.86)
Day labourer	05(03.40)	8 - 11	07(04.76)
Maid servant	03(02.04)	Mean ± SD	6.02 ± 2.14
Business	13(08.84)	**Source of water**	
Agriculture	51(34.69)	Tube-well	45(98.64)
Rickshaw-puller	06 (04.08)	Tap-water	02(01.36)
Student	03(02.04)	**Type of latrine**	
Driver	02(01.36)	Kancha latrine	40(27.21)
Carpenter	02(01.36)	Open field defecation	05(03.40)
Masonry	03(02.04)	Sanitary latrine	102(69.39)

Out of 147 respondents, the highest and lowest variation of age was 78 and 18 years respectively. The mean age of the respondents was (Mean ± SD = 40.79 ± 14.98) 41 years. Male and Female respondents were 92(62.59%) and 55(37.41%) respectively and of them 112(76.19%) married and 35(23.81%) unmarried. Occupation of 51 (34.69%) respondents were agriculture and 47 (31.98%) respondents were housewives mainly.As to educational status, 28 (19.05%) respondents were quite illiterate, majority of them 107 (72.79%) were below graduation. Monthly family income of 05 (03.40%) respondents was <5000 taka, 67 (45.58%) within the range of 5000 – 10000 taka, 49 (33.33%) within 10000 – 15000 taka. Majority respondents 88 (59.86%) had 5-8 family members, 52 (35.38%) had 2-5 family members. Most of the respondents 145 (98.64%) used tube-wells as their source of drinking water. Majority of the respondents 102(69.39%) used sanitary latrine, 40 (27.21%) used kancha latrine & only 05 (3.40%) used open field for defecation (Table-1).

B. Basic information:

Table-2: Practice of personal hygiene:

Variable	n(%)	Variable	n(%)
Method of taking bath		**Method of washing hair**	
With soap & water occasionally	02(08.16)	With soap & water	68(46.26)
With soap & water daily	25(17.01)	With shampoo & water	55(37.41)
With soap & water at interval	04(70.75)	With soap-shampoo-water	24(16.33)
With soap & water weekly	06(04.08)	**Habit of washing hands**	
Habit of brushing teeth		Before & after taking meal, After defecation	131(89.12)
Daily	143(97.28)		
At interval	04(02.72)	Before & after taking meal, Before preparing & cooking food, After defecation	09(06.12)
Frequency of brushing teeth daily			
One time	92(62.59)		
Two times	47(31.97)	All of above	07(04.76)
Three times	08(05.44)	**Material used washing hands**	
Method of cleaning teeth		Only water	89(60.54)
Brush-tooth paste	89(60.53)	Soap & water	58(39.46)
Brush-Charcoal	07(04.76)	**Material used for washing hands after defecation**	
Finger-Charcoal	25(17.01)		
Only Meswak	13(08.85)	Only water	37(25.17)
Meswak-Charcoal	13(08.85)	Soap & water	51(34.69)
Frequency of cutting nails		Mud & water	35(23.81)
Weekly	94(63.95)	Ash & water	24(16.33)
Fortnightly	30(20.40)	**Defecation done barefooted**	
At leisure time	23(15.65)	Yes	34(23.13)
Frequency of washing hair		No	113(76.87)
Occasionally	09(06.12)	**Habit**	
One time daily	14(09.52)	Tobacco smoking	65(44.22)
At interval	96(65.31)	Betel leaf & nut	49(33.33)
Once a week	28(19.05)	Nothing	33(22.45)

Out of 147 respondents, 110 (74.83%) took their bath 'with soap & water at interval', 25 (17.01%) 'with soap & water daily' and 12 (08.16%) 'with soap & water occasionally'. 143 (97.28%) respondents had their teeth brushed daily but majority 92 (62.59%) had their teeth brushed one time daily. Maximum 89 (60.53%) cleaned their teeth with 'Brush-tooth paste', 45 (30.62%) used 'Charcoal'. Majority respondents 94 (63.95%) cut their nails weekly and 23 (15.65%) at any leisure time. 68 (46.26%) respondents washed their hair by 'soap & water' and only 24 (16.33%) washed their hair by 'soap-shampoo-water'. Majority respondents 96 (65.31%) washed their hair at interval and 09 (06.12%) occasionally and only 14 (09.52%) washed their hair one time daily. Regarding washing hands, 131 (89.12%) washed their hands 'before & after taking meal & after defecation'. Before taking meal, majority of the respondents 89 (60.54%) washed their hands with 'only water'.After meal, majority of the respondents 51 (34.69%) washed their hands by using 'soap & water' but after defecation, 37 (25.17%) washed their hands by 'only water'. 34 (23.13%) went for defecation barefooted but majority of the respondents 113 (76.87%) did not go for defecation barefooted. Majority 65 (44.22%) had the habit of 'tobacco smoking', 49 (33.33%) respondents 'betel leaf & nut' but 33 (22.45%) respondents did not have any habit at all (Table-2).

Table-3: Knowledge regarding health problems:

Variable	n(%)	Variable	n(%)
Effect of using charcoal		**Diseases from using latrine barefooted**	
Problem in teeth	47(31.97)	Worm infestation	56(38.10)
Don't know	100(68.03)	Don't know	91(61.90)
Transmission of diseases through dirty nails		**Avoidance for the prevention of obesity**	
Diarrhoea, Dysentery	56(38.10)	Eating excessive rice	48(32.65)
Worm infestation	05(03.40)	Eating vegetables	13(08.84)
Diarrhoea, Worm , Dysentery, Typhoid	43(29.25)	Doing physical work	07(04.76)
All of above	03(02.04)	Eating excessive rice, Taking fat or oil, Eating meat, Eating fast food	56(38.10)
Don't know	40(27.21)		
Diseases transmitted if not washing hands after defecation		Don't know	23(15.65)
Dirrhoea, Dysentery	73(47.86)		
Diarrhoea, Worm , Typhoid, Dysentery	12(08.16)		
All of above	22(14.97)		
Don't know	40(27.21)		
Problems if not taking care of hair			
Dandruffs	66(44.90)		
Lice	23(15.64)		
Dandruffs, Lice	29(19.73)		
Don't know	29(19.73)		

Out of 147 respondents, many of them did not have any knowledge about health problems from inappropriate maintenance of personal hygiene. The respondents answered "Don't know" regarding Effects of using charcoal 100 (68.03%), Transmission of diseases through dirty nails 40 (27.21%), Diseases transmitted if not washing hands after defecation 40 (27.21%), Problems if not taking care of hair 29(19.73%), Diseases from using latrine barefooted 91(61.90%), Avoidance for the prevention of obesity 23(15.65%) respectively (Table-3).

Discussion:

In this study we assessed the knowledge, attitude and practices regarding particular aspects of personal hygiene among rural adult people of both sexes. The study reflected that all the respondents 147(100%) were adult rural people of both sexes. The highest and lowest variation of age was 78 and 18 years respectively. The mean age of the respondents was (40.79 ± 14.98) 41 years. 19.05% respondents were quite illiterate. Occupation was mainly agriculture (34.69%) and housewife (31.98%). Monthly family income of most of them (45.58%) was within 5000–10000 taka having 5-8 family members (59.86%). 27.21% respondents used kancha latrines and still 3.40% used open field for defecation. Tube-well was the main source of drinking water forrespondents (98.64%). Only 17.01% respondents took their bath

with‘soap and water’daily. Majority respondents (97.28%) had their teeth brushed daily but only 5.44% of them did so three times. 39.47% respondents did not use tooth-paste and 36.05% did not cut their nails weekly. Only 16.33% washed their hair with ‘soap-shampoo-water’. 60.54% respondents washed their hands with ‘only water’ beforemeal& 25.17% did so with only water after defecation. 27.21% respondents did not have any knowledge about the transmission of diseases through dirty nails and even after defecation if not hands washed properly. 19.73% respondents did not have knowledge regarding problems if not taking care of hair. 23.13% respondents went for defecation barefooted. 61.90% respondents did not have knowledge about transmission of diseases from using latrine barefooted. 15.65% did not know how to avoid obesity. 44.22% and 33.33% respondents had the habit of 'tobacco smoking’ and ‘betel leaf & nut’ respectively. In contrast with other studies, the observation from the study conducted by Imtiaz et al. revealed that the mean age of the respondents was 33 years.[10] Regarding educational qualification, 87.33% were educated in different levels and 12.67% were illiterate. Occupational status revealed majority (74.67%) of them were housewives. Regarding economic condition, most (60%) of the respondents had family income <10,000 Taka. In this study, majority (87.34%) had practiced hand washing before eating. Majority (95.34%) practiced hand washing after defecation, among them (82%) used soap, 16% used ash and 2% used soil after defecation. In this study, majority (90.67%) used tube well which was not marked red, 6% used pond and 3.33% used river as their source of drinking water. The study observation conducted by Ghose et al. revealed that the knowledge of the students regarding tube well water for drinking was significantly higher in rural area (98.3%) compared to urban area. In addition, tube well water was stated as safe for bathing by 77.3% and safe for washing by 80.3% students. Hand washing before meal with soap and water was found almost similar among urban and rural students but hand washing with soap and water after defecation was found significantly better practiced in urban (97.2%) students. Practice regarding tooth paste use was higher in urban (80.6%) area and charcoal use (10.0%) was still found in rural areas.[11] The study observation conducted by Farah et al. revealed that out of 475 respondents, more than fifty percent slum dwellers resided in tin shaded room while 21.7% in ‘kacha’ houses. 66% of the respondents used to drink water from tube-well and 24% used supplied water provided by the city corporation. The study revealed that near 59% of the respondents used sanitary latrine. About 67% slum dwellers regularly practiced hand washing before taking meal and 59.2% respondents used soap after defecation. About 50% respondents brushed their teeth regularly with tooth paste. Regarding personal cleanliness, 81% subjects took bath regularly while 78% washed clothes irregularly.[12] Comprehensive knowledge about these issues should be used to improve low-cost but highly effective programs that will meaningfully attenuate the burden of transmissible diseases among the people in rural settings.

Conclusion:

Study findings emphasize the need for more continuous community hygiene education program which improves the hygiene behavior and awareness of the people residing in rural communities of Bangladesh. Proper practice of personal hygiene has significant importance to substantially reduce the transmissible disease burden borne by the people in rural settings to lead a healthy life. The villagers of Bangladesh should be well motivated regarding particular aspects of personal hygiene by regular health education programs.

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Review Article

DCIMCJ 2017 July; 4(2):70-75

Estimation of Stature from Head Circumference and Hand Length in Garo Adult Females of Bangladesh

Akhter Z[1], Alam MM[2], Hossain S[3], Kashem K[4], Chowdhury MAA[5]

Context:

Stature is the height of the person in the upright posture. It is an important measure of physical identity. Interrelationships among different body measurements may be used to estimate one from another in case of missing body parts. As any part of the human skeleton can be found as the evidences, there arise a need to investigate whether there is any possible significant correlation between stature and any parts in human body. Bangladesh is not a country only for the Bengalis but it harbors many cultures and people of different races because of the colonial rules of the past regimes. Garos, study subject living in Bangladesh are usually recognized as an ethnic community, they have a separate identity and their physical appearance is distinctive to some extent. There was an intention to establish ethnic specific anthropometric data for the Bangladeshi Garo tribal populations, to determine whether there is any correlation between the measured value of the stature and the physically measured variables, to estimate (using respective multiplication factor) the stature from the physically derived measurements.

Keywords: Anthropometry, stature, head circumference, hand length, correlation, multiplication factor

Introduction:

Anthropometry is the science of measuring the human body and its parts. Craniofacial anthropometry, involves measurement of the skull and face[1]. Stature or body height is one of the important and useful anthropometric parameter that determines the physical identity of an individual[2].

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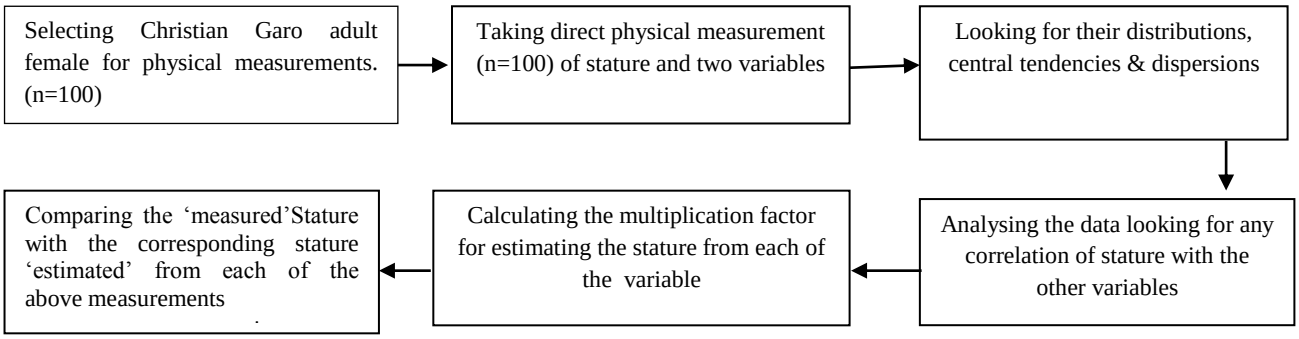
Anthropometric measurements of different body parts are used in differentiating between ethnic groups, in identifying missing persons and suspects, in treating craniofacial deformities etc. Standards based on ethnic or racial data are desirable because these standards reflect the potentially different patterns of craniofacial growth resulting from racial, ethnic and sexual differences[3].

The People:

The Garo (Mendi) Adivasi living in Bangladesh are usually recognized as an ethnic community, they have a separate identity. They mostly live in Mymensingh, Netrokona, Tangail, Sylhet and Sunamgonj districts of our country. They are an ethnic group of 'Tibbeti Borman', belonging to the Mongolian human race. They are different from any other tribal community and of course not consistent with the tradition of mainstream Bangladeshi common people[4].

These studies were basically observational, cross-sectional and descriptive in nature and carried out on 100 Christian Garo adult females aged 25-40 years at different locations of Dhaka city and Mymensingh district. The stature was taken by using steel plate and steel tape[5]. The head circumference was measured by using flexible measuring tape[6]. The length of hand was measured as the straight distance from the distal wrist crease to the most forwardly projecting point on the middle finger. A manual sliding caliper was used to measure the hand length.

Flow chart showing the outline of the study



Calculations of multiplication factors:

Each 'multiplication factor' is the ratio of the stature to the two variables. Mean multiplication factor was then calculated from these variables. This means multiplication factor was used for estimating the stature from head circumference and head length.

Multiplication factor (M.F.):

$$M.F = \frac{\text{Stature}}{\text{Head circumference/head length}}$$

Table 1: Stature , hand length, head circumference and their descriptive statistics, multiplication factors and correlation with stature

Variable	Range (cm)	Mean (cm) ± SD	Mean multiplication factor*	Significance of correlation (p value)
Stature	137.00-168.50	152.79 ± 5.62	_	0.00(S)
Length of hand				
Right	14.70-17.94	16.39 ± 0.72	9.33	0.00 (S)
Left	14.80-18.23	16.33 ± 0.67	9.37	0.00 (S)

n :100 for each variable

S: significant at 5% level in regression analysis NS: Non significant

Table 2: Stature , head circumference and their descriptive statistics, multiplication factors and correlation with stature

Variables	Physical measurement			Mean multiplication factor ± SD	Significance of correlation with stature
	Range(cm)	Mean(cm) ±	*SD*		
Stature	136.00-168.50	152.79 ±	5.62		
Head circumference	49.00-55.00	51.56 ±	1.44	2.97 ± 0.12	p=0.005 (S)

Table 3: Comparison between the 'measured' stature and the stature 'estimated' from hand length

Measurement from which the stature was estimated	Measured stature (cm)	Estimated stature (cm) †		Significance of difference (p value)
	Mean ± SD	Range	Mean ± SD	
Length of hand				
Right		137.15-167.38	152.96 ± 6.70	0.88(NS)
Left		138.68-170.82	153.05 ± 6.31	0.75(NS)

n= 100 for each variable † The mean estimated stature against each upper limb variable was obtained by multiplying each individual value for that variable by the respective mean multiplication factor (as shown in table 1) and then calculating the mean for that. Significance of difference was tested by paired t test setting the level of significance at $p<0.05$ NS: Non-significant

Table 4: Comparison between the 'measured' stature and the stature 'estimated' from head circumference

Cranial variable	Measured stature			Estimated stature*			Significance of difference †
	Mean	±	SD	Mean	±	SD	
Head circumference	152.79	±	5.62	153.12	±	4.30	p=0.586 (NS)

* The mean 'estimated' stature against head circumference was obtained by multiplying each individual value (n=100) for the variable by the respective mean multiplication factor (as shown in Table 1.1).Then the mean of 100 values was calculating for that variable.

† Significance of difference was tested using the paired't' test setting the level of significance at $p<0.05$.

NS: Non-significant

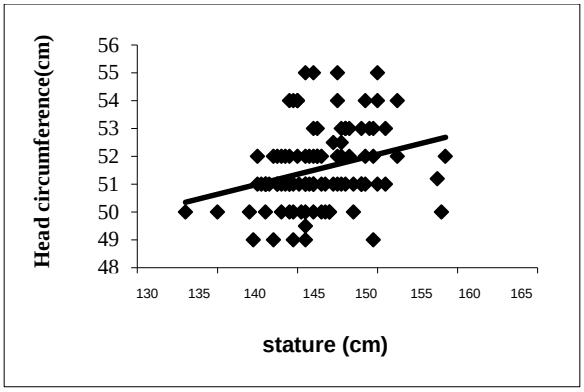


Fig. 1 Scatter diagram with regression analysis showing significant positive correlation between the stature and the head circumference (r= 0.278 and p= 0.005).

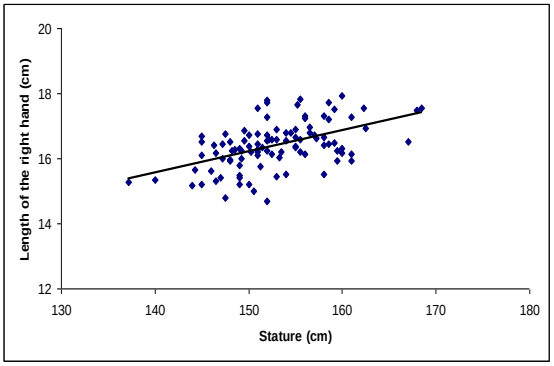


Fig. 2 Scatter diagram with regression analysis showing positive correlation (r = 0.51) between the stature and length of the right hand ofthe Christian Garo adult females (n= 100)

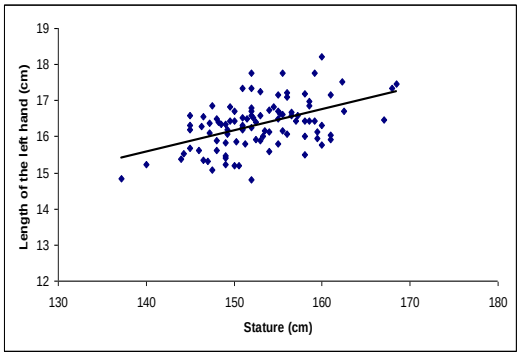


Fig. 3. Scatter diagram with regression analysis showing positive correlation (r = 0.49) between the stature and the length of the left hand of the Christian Garo adult females (n=100)

Discussion:

These studies were carried out among Christian Garo adult females with a view to measuring the stature and the head circumference and hand length. It also looked for any correlation between stature and head circumference. Estimation of stature was made from head circumference using multiplication factor and effectiveness of these estimations were tested. Garo tribe belongs to the Mongoloid race, some similarities are expected to exist with other ethnic groups of the Mongoloid race and some dissimilarity may be expected with other races. The mean stature was found as 152.79 cm, which was within close range of those of those of the Chinese[7], Japanes[8] and Philipphino[9] .Mongoloid population while it was relatively greater that of the rural Bengali females[10] and it was smaller than that of the urban Bengali females[11]. In comparisons with those of the Austrao Asiatic 'Santhal'[12], Indo-European 'Dhanka's'[13] and Dranvidian'Khond'[14], 'Udopi'[15] and 'Mysorean'[16] populations of India revealed varied results. A similar result was found with two Black populations – 'Somalis' of Ethiopia[17]. and 'Uromis' of Nigeria[18]. On the other hand, The Garo mean stature was greater than that of the Nigreto[19]. 'Onge' population of the little Andamans of India. It may be noted that the Somali females showed the greatest mean stature, while the Onge females had the smallest one.

The mean value of the head circumference showed smaller than that of the value of the Japanese[8] the Mongoloid females. But it is similar to that of a 'Mysorean' population[16] of India while it is lower than that of the Austro-Asiatic 'Santhal'[12] and Dravidian 'Khond' [14]. populations

of India. Again there showed that of the value of the head circumference lower than that of the Turkish female populations [20] whereas it is greater than that of a Negroid 'Onge' population[19]. of the Little Andaman of India In our study. The mean of the average lengths of the two hands of the Christian Garo females of the present study is within close range of that of an urban Bengali female[11]. The stature was found to have significant positive correlation with head circumference and in both sides of the hand length. There was no significant difference found between the 'measured' and 'estimated' stature for head circumference and both sides of the hand length. This indicates the effectiveness of the corresponding multiplication factor in these estimations.

As the cranial measurement and stature facilitate identification of missing person and helps in diagnosis and treatment of some anomalies, so knowledge of normal value for these regions produces the best aesthetic and functional results. These values may also be helpful to the anatomists for normatic references. Significant correlations, detected in the study between some of the measurements can be utilized in the determination of proper multiplication factors to be useful in estimating one measurement from another.

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Case Report

DCIMCJ 2017 July; 4(2):76-79

Extrapulmonary Tuberculosis Presenting as Obstructive Jaundice Mimcking Biliary Stricture and Ampullary Carcinoma

Masum QAA[1], Mubin AQM[2], Ishaq SM[3], Khan MR[4], Rahman MM[5], Rahman MA[6]

Abstract:

Obstructive jaundice as the sole presentation of extra-pulmonary tuberculosis is a rare entity with only a few cases reported in the literature. Patients with this condition usually present with a protracted illness, jaundice and weight loss, which may be confused with hepatobiliary and pancreatic malignancies. A 30-year-old lady presented with a history of jaundice associated with low-grade intermittent fever and weight loss of six months' duration. Diagnostic imaging techniques revealed stricture in terminal common bile duct with dilatation of the rest of the extrahepatic and intrahepatic biliary ducts. Differential diagnoses were distal cholangiocarcinoma or ampullary carcinoma. Subsequent histopathology of resected ampullary lesion showed caseating granulomatous inflammation consistent with tuberculosis. She was treated successfully with a four-drug antitubercular regimen with complete resolution of symptoms and normalization of laboratory parameter.

Keywords: Obstructive jaundice, extra-pulmonary tuberculosis, caseating granulomatous inflammation

Introduction:

Tuberculosis (TB) can involve any organ of the body and is a disorder of protean manifestations[1]. Although obstructive jaundice as the presentation of tuberculosis has been described in a few case reports, it is an extremely rare cause of biliary stricture. Many cases of lymph node, gall bladder, duodenal and pancreatic tuberculosis are reported [2]. BIliary tuberculosis is extremely rare. The main symptoms of TB biliary stricture including jaundice and weight loss are usually indistinguishable from those of other diseases such as cholangiocarcinoma[1]. The diagnosis is often missed or delayed prior to surgery or even be diagnosed postmortem. In an old autopsy series, Stemmerman found only 45 instances (3%) of biliary tuberculosis in 1500 cases with tuberculosis. Furthermore, jaundice was present in only 3 (6.7%) of these 45 cases[3]. Only about 20 cases of biliary stricture caused by tuberculosis are available in the English literature, and only one case has been reported from the Middle East[2]. Here we are presenting a case of biliary TB mimicking biliary stricture on imaging and ampullary carcinoma on endoscopy in Bangladesh.

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Case report:

A 30 years old lady presented with jaundice and low grade intermittent fever for 6 months. She lost 6 kg weight in the last three months despite good appetite. She developed generalized itching for last one month. Her stool color was normal. There was no history of abdominal pain. She gave no history of vomiting, hematemesis or melena. Her bowel habit was normal.

There were no history of rectal bleeding or passage of altered blood per rectum. She gave no history of cough, hemoptysis, chest pain and breathlessness. She had no history of tuberculosis or contact with tubercular patient.

She was ill-looking, mildly anemic, deeply icteric. Temperature was normal. There were scratch marks in the skin and nails were shiny. Clubbing, koilonychia, leukonychia and palmar erythema were absent. There were no bruises or ecchymoses. Lymph nodes were not palpable. No edema, no dehydration. Flapping tremor was absent. Blood pressure was normal.

Liver was palpable, 2 cm from mid clavicular line, firm smooth, nontender, with sharp and regular margin. Upper border of liver dullness was at right 5th intercostal space. There were no bruits. Gallbladder was not palpable. Spleen was not palpable. There were no other intraabdominal mass or lump. Ascites was absent.

No abnormality was found in respiratory system examination.

Investigations revealed hemoglobin 11.8 gm/dL, ESR 110 mm in first hour, white cell count 11000/cubic mm, neutrophil 76%, platelet count 470000/cubic mm. Blood film showed neutrophilia with thrombocytosis. Serum bilirubin 127 micromol/L, ALT 137U/L, alkaline phosphatase 1520 U/L. Prothrombin time: patient 12.4 seconds, control 11.8 seconds, INR 1.04. Serum CA 19-9 52.59 U/mL. Chest x-ray was normal. Abdominal ultrasound revealed dilated intrahepatic biliary ducts (IHBDs), dilated (13.8 mm) common bile duct (CBD) with marked wall thickening and irregularity, sludge in gallbladder lumen swollen and heterogenous pancreas (more marked in the head region), and dilated (5.3 mm) main pancreatic duct (MPD).

Magnetic resonance cholangiopancreatography (MRCP) revealed smooth tapering with marked narrowing resulting almost complete occlusion at mid and distal CBD, markedly dilated CHD and IHBDs, CHD was beaded in appearance having irregular wall, short segment concentric narrowing at head and body region of MPD with dilatation of the rest of the MPD. Complimentary computed tomographic (CT) scan of abdomen revealed pre-& para-aortic lymphadenopathy.

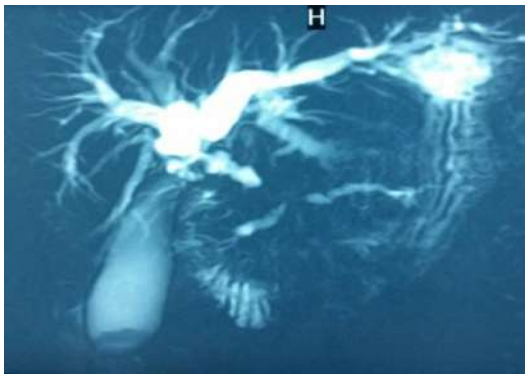


Figure 1: MRCP showing biliary and pancreatic ductal abnormalities (see text for description)

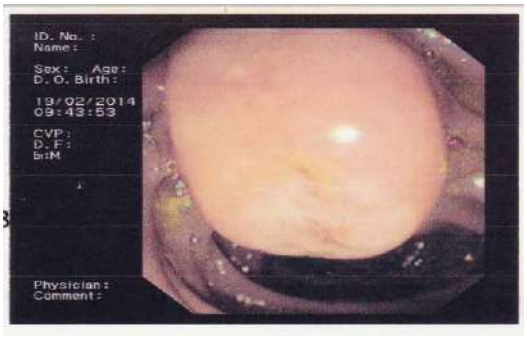


Figure 2: Endoscopic view of ampulla



Figure 3: Cut surface of ampulla after partial ampullectomy

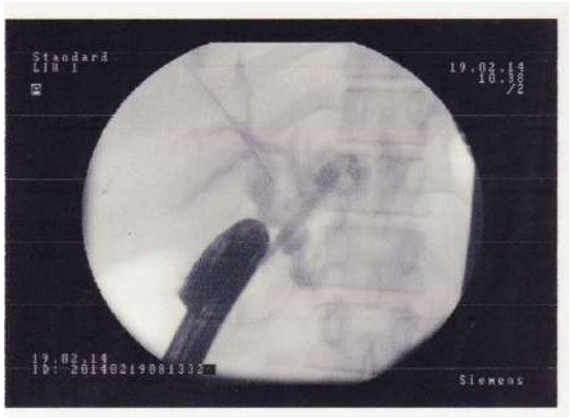


Figure 4: Cholangiogram showing narrowed terminal CBD, and dilated CBD, CHD & IHBDs

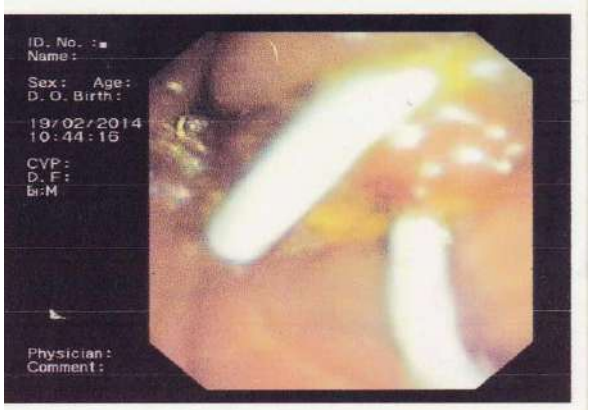


Figure 5: Pig tail catheter in situ in CBD with bile flow

Patient underwent endoscopic retrograde cholangiopancreatography (ERCP). Followings were ERCP findings:

Papilla: fleshy, swollen, bulged out and bleeds on touch. Little bile flow was seen.

Cholangiogram: Terminal CBD was narrowed. Rest of the CBD, CHD & IHBDs were dilated. No filling defect was seen.

Pancreatogram: Not attempted.

Therapy: Findings were consistent with ampullary carcinoma. Partial ampullectomy was done for cannulation by polypectomy snare and that was followed by stenting (10 Fr, 5 cm, double pigtail plastic biliary stent). After stenting flow of bile was seen.

Resected part of the ampulla was sent for histopathology. Sections made from the submitted specimen showed multiple epitheloid granulomas containing Langhans' type of giant cells and few foci of caseous necrosis were also present. No malignancy was seen. Histopathology revealed granulomatous inflammation consistent with tuberculosis.

Patient was started with 6 months' regimen of antitubercular chemotherapy. On subsequent follow up visits, there were clinical improvement, disappearance of fever, weight gain, clearance of jaundice and subjective wellbeing. There was reduction of ESR & platelet count, raise of hemoglobin, and normalization of ALT & alkaline phosphatase. CA 19-9 level also decreased to 6.8 U/L. Patient's biliary stent was removed 6 months after placement. Therapy was continued up to nine months. She was followed up to six months after completion of antitubercular therapy. She was well, and there were no features of recurrent disease.

Discussion:

Obstructive jaundice as the sole presentation of extra-pulmonary tuberculosis is a rare entity with only a few cases reported in the literature. The cause of jaundice in tuberculosis is multifactorial. Most case reports describe obstructive jaundice secondary to tuberculous involvement of the biliary tree, pancreas or ampulla of Vater and post-tubercular biliary stricture[1]. Jaundice can also occur secondary to compression of bile ducts by enlarged lymph nodes in the porta hepatis[1]. Either the primary biliary tuberculosis or external compression by adjacent organs can lead to formation of strictures that may be single or multiple and are difficult to diagnose accurately pre-operatively[4]. Patients with this condition usually present with a protracted illness, obstructive jaundice and weight loss which may be confused with hepatobiliary malignancies[1]. The diagnosis is often missed or delayed and the patientis subjected to unnecessary surgical procedures. Our patient presented with weight loss, jaundice and

itching. Laboratory data showing cholestasis and imaging revealed stricture in distal CBD with dilatation of proximal CBD, CHD and IHBD, and stenoses in MPD in head and body region with dilatation indistal part along with pre- and para-aortic lymphadenopathy suggested the possibilities of hepatobiliary and pancreatic malignancies.

In the literature, it is reported that the clinical and cholangiographic features of tuberculous biliary stricture are usually not helpful in differentiating tuberculosis from other common causes of endoluminal biliary stricture, such as primary sclerosing cholangitis or cholangiocarcinoma[4]. Alvarez and Sollano described four characteristic cholangiographic features for hepatobiliary tuberculosis: 1) a tight hilar stricture with dilated intrahepatic ducts, 2) a long smooth stricture involving the distal bile duct, 3) pruning of the distal intrahepatic ducts, and 4) sclerosing cholangitis-like changes[4]. In our patient, MRCP revealed smooth tapering with marked narrowing resulting almost complete occlusion at mid and distal CBD, markedly dilated CHD and IHBDs, CHD was beaded in appearance having irregular wall, short segment concentric narrowing at head and body region of MPD with dilatation of the rest of the MPD. Complimentary computed tomographic (CT) scan of abdomen revealed pre-& para-aortic lymphadenopathy. With these imaging findings, we considered cholangiocarcinoma, pancreatic carcinoma, chronic pancreatitis, autoimmune pancreatitis with associated autoimmune cholangitis, lymphoma and tuberculosis in our differential diagnoses. However, we did not considered TB initially.

On ERCP, endoscopic findings of the ampulla were so impressive that we were virtually convinced that the lady had developed ampullary carcinoma with infiltration into biliary and pancreatic ducts.

The diagnosis of biliary tuberculosis is difficult. Recent reports have suggested the usefulness of the examination of the bile obtained during ERCP by cytology or PCR-based techniques for the demonstration of the bacilli[4]. However, the diagnostic accuracy of these techniques has not been confirmed, and it is reported that only 1 of 5 patients with biliary tuberculosis had positive cytologic results [4].

The diagnosis was made by histopathological examination of resected specimen of the ampulla. The histopathology report suggesting tuberculosis came as a welcome surprise.

Treatment of hepatobiliary tuberculosis does not differ from that of other forms of tuberculosis but poses its own challenge as most of the antitubercular drugs are hepatotoxic[1]

Conclusion:

This case is a reminder to physicians to be aware about uncommon presentation of this common condition. Biliary tuberculosis should be considered in the differential diagnosis of patients with cholestasis and sclerosing cholangitis-like findings on MRCP and/or ERCP. The importance of a tissue diagnosis in all cases of obstructive jaundice should not be forgotten.

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Case Report

DCIMCJ 2017 July; 4(2): 80-83

Malignant Giant Cell Tumor of the Anterior Ribs Occurring in a Pregnant Lady: A Rare Case Report

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Abstract:

Malignant giant cell tumors (MGCT) of bone are very rare. MGCT involving the ribs are rare and rarer in pregnancy. A 25-year-old primi-gravida lady was diagnosed to have MGCT in the anterior arc of the left 4th and 5th ribs with a history of recent trauma and was surgically managed successfully by en bloc removal of the tumor mass along with the diseased ribs and chest wall reconstruction.

Keywords: Bone tumors, malignant bone neoplasm, pregnency with giant cell tumor

Introduction:

Giant cell tumors (GCT) of the bone are usually benign, locally aggressive and account for 5% of all primary bone tumors.[1] Only 1-2% of GCTs are of malignant entity and therefore are very rare. Exposure to radiotherapy is believed to trigger malignant transformation of GCT in most of the cases.[2] GCTs in the rib account for less than 1% of cases.[3] Posterior presentation of GCTs are commonly found and involvement of anterior ribs are very rare.[4] GCT shows slightly female predominance.[5] However, GCT in the anterior rib in close proximity to the breastmay pose a diagnostic and therapeutic dilemma.[6] GCT during pregnancy is unusual.[7] Moreover, there is chances of missed or delayed diagnosis because the symptoms may mimic the pregnancy related symptoms.[8] Therefore, this unusual presentation prompted us to report the case.

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Case report:

A 25-year-old primi-gravida lady presented in the 2nd trimester (17th week of gestation) with left sided chest pain following a fall from chair. She was diagnosed as a case of left sided haemothorax or pleural effusion and was managed by drainage of hemorrhagic pleural fluid by left sided tube thoracostomy. She was discharged after removal of drain tube on 7th POD with some improvement. However, a mild pain remained on the affected site. She delivered a baby after 34 weeks of gestation but the baby died within one hour. Since then, her pain had

significantly aggravated and she complained of dyspnea even at rest. Again a tube thoracostomy was carried out and hemorrhagic pleural fluid was drained from the left side. Meanwhile, a small lump was discovered at the left anterior chest wall, which was hard, having irregular surface, tender, immobile andthe overlying skin was free. The lump grew fast and by one month it was about 6x6 cm^2 in size. She was investigated thoroughly in our hospital. Serum acid phosphatase was normal.

FNAC report was inconclusive; therefore an open biopsy was done which revealed a lipomatous lesion. However, GCT was the other differential diagnosis. Eventually, she underwent left standard postero-lateral thoracotomy under general anesthesia with one lung ventilation. On exploration, there was a large tumor originating from the left 4^{th} and 5^{th} ribs. The whole tumor mass including the involved ribs were removed en bloc keeping a 4cm clear margin in gross vision. Chest wall reconstruction was done using prolene mesh. Postoperatively, she recovered well. Histopathological report confirmed the diagnosis of MGCT and the margins were disease-free. She was discharged on 15^{th} POD in satisfactory condition with advices on medication and follow-up with chest X-ray after 1 month. On subsequent follow-up, there was no sign of active disease and she was symptom free.

Discussion:

GCTs, irrespective of behavior, are very aggressive. Pain, swelling and limitation of joint movements are the cardinal features. Incidences in females are slightly higher than males. GCTs along with osteosarcomas and chondrosarcomas are also reported as pregnancy tumors by several authors.[8,9,10] However, the exact mechanism of occurrence, promotion and development of GCT during pregnancy is unclear. One possibility is, because of presence of estrogen or progesterone receptors on the tumor cells which may induce thehormonal and immunologic mechanisms. However, this explanation is still controversial.

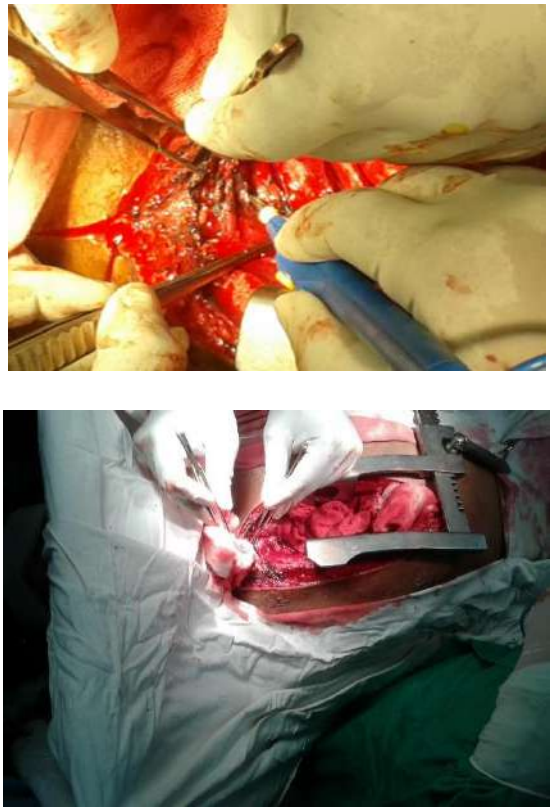


Fig 1: Removal of the tumor, Top- during removal and Bottom- after removal of the tumor

Moreover, onco-fetal antigens, which are present on tumor cells and are shared with or resemble fetal antigens, may explain tumor promotion during pregnancy.[8,11] In our case, the patient presented with pain and lump but firstly, she reported a history of trauma and the lump was initially unapparent. Furthermore, serum acid phosphatase, which is an important marker of osteoclastic activity, was also negative. All of these confused us and delayed reaching the diagnosis. FNAC for chest wall tumors are inconclusive most of the times and therefore, open biopsy is considered as more appropriate.[12] Similarly, FNAC was inconclusive and open biopsy declared a possibility of GCT in our case. However, hormonal screenings for estrogen and progesterone receptors on tumor cells were not carried out.

Currently, curettage with or without use of alcohol, liquid nitrogen, phenol or methyl-acrylate or bone graft and surgical resection are the treatment modalities of GCTs. However, 10% of GCTs in the ribs may undergo malignant transformation, therefore, excision is desirable.[13] En bloc resection is considered as appropriate and survivability is directly proportional to negative resection margin.[14] Chest wall reconstruction is necessary if the defect is wide and located anteriorly or laterally.[2] A report on a 31-year-old pregnant lady presented with recurrence of GCT in the lumbar spine underwent excision of the tumor in post-partum period resulted with excellent outcome.[15] Another report on a 36-year-old primi-gravida lady presented with lumbar giant cell tumor underwent elective caesarean section with a view to curative resection of the tumor in single stage followed by adjuvant chemotherapy with 'Denosumab' showed good outcome.[7] In our case, the tumor mass was removed en bloc with negative resection margin as supported by histopathology. Because of the extensive resection, chest wall reconstruction was carried out to make it cosmetically acceptable. She was leading almost a symptom free life on subsequent follow-up.

Conclusion:

GCTs of bone are common but MGCTs are rare. Moreover, involvement of the anterior ribs is rarer. Furthermore, GCTs appearing during pregnancy is also very rare. At times, it may confuse the diagnosis and treatment particularly if it is nearer to the breast. However, en bloc removal of the tumor mass with disease free margin results in good outcome and ensures improved survivability.

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