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Address of Correspondence:
Prof. Anup Kumar Saha, Editor-in-Chief, Sir Salimullah Medical College Journal
Department of Medicine, Sir Salimullah Medical College & Mitford Hospital, Dhaka-1100.
Mobile: 880-1819259347, email: np_saha@yahoo.com

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Editorial

Antimicrobial Resistance - A Public Health Issue

Introduction

Antimicrobial drugs (Medicines) play an important role in infectious control of health care delivery and disease prevention. The availability and affordability of good quality of antimicrobial drugs along with their rational use is needed for effective health care. Antimicrobial agents are the most frequently prescribed drugs among hospitalized and outdoor patients. However, irrational antimicrobial drugs use is prevalent, especially in the developing countries like Bangladesh due to irrational prescribing, dispensing, and administration of medications.[1-5] Excessive and inappropriate antibiotic use can lead to the emergence of bacterial resistance. Resistance of common hospital acquired bacteria to antibiotics is a worldwide problem. It can lead to increased morbidity, mortality,length of hospital stay and healthcare expenditures.[6-10] Rational use of antimicrobial drugs is based on 'Rule of Right' - 'The right drug given to the right patient at the right time with the right doses'. They should also fulfill safety, affordability, need and efficacy.[11-13] Prevention of antibiotic misuse is the key for controlling the antibiotic resistance. Therefore, it is immensely important to review in and outpatient prescribing practice on regular intervals. Antibiotics are the most commonly used drugs. Their irrational use leads to a number of consequences; in term of cost, drug interactions, hospital stay and bacterial resistance.[14-15] The use of antimicrobial drugs in food-producing animals can result in anti-microbial drug–resistant in fections in humans. A good example is the use of fluoro-quinolone in poultry and the emergence of fluoroquinolone-resistant Campylobacter infections among humans. However, topics of intense debate include the widespread use of antimicrobial drugs in animals, the extent to which antimicrobial drug use in animals affects human health, what drugs used in animals could be cause for concern to humans, and how to prevent overall risks to human health. The issue is complex from both policy and science perspectives. Antimicrobial drugs are used to raise all types of food-producing animals, but detailed drug use data are still lacking, making efforts to change drug use practices particularly challenging. In addition, because mobile genetic elements can confer new resistance on bacteria that already have complex ecology, there is often a lack of direct evidence to link the use of a particular antimicrobial drug to a specific resistant organism in humans[16-20].

Policies that drive antimicrobial drug use, or lack of use, in animals can have profound effects on the health of the world's population, the health of the agricultural industry, and the world's food supply. However, even those well-versed in the topic of antimicrobial drug resistance find the issues of antimicrobial drug use in food-producing animals to be confusing and loaded with contrary political opinions on the significance of the public health threat and how best to address it.

The events and milestones that have been driving forces in the use of antimicrobial drugs for food production efforts and objectively out lines the effect these efforts have had on the problem of drug resistance. For example, few are aware of the effect World War II had on supply chains of traditional animal feed supplements such as cod liver oil and fishmeal. In the United States, this interruption resulted in the transition to using antimicrobial drugs to boost the growth of food-producing animals[21].

Risk factors of Antimicrobial résistance (Bangladesh perspective): Bangladesh is a small country (147,570 sqkilometers)with a huge population of about 160 million. Bangladesh is making good progress in all of the health related MDGs due to successful EPI program against vaccine preventable diseases. But Antimicrobial resistance is an emerging public health problem

due to emerging & re-emerging microbial pathogenic diseases (e.g., Ebola, NIPAH, Anthrax, MDR TB, Resistant malaria).

Being a resource constraint country with compromised sanitation, inadequate safe water, personal hygiene, malnutrition and overcrowding, infectious diseases are prevalent at large scale.

The climate change being favorable for breeding of insect, vector borne diseases also exists and favorable for increased AMR microbes. So, use of antimicrobials in percentage and in real number is quite high. Also, prevalence of emerging infectious diseases causing immunosuppression compels people to be dependent on antimicrobials. Bangladesh has pharmaceutical industry with more than 250 industries producing huge quantity of antimicrobials.There exist poor quality and fake antimicrobials in the market. People can buy antibiotics without prescription and any people can sale antibiotics without prescription . Physicians often prescribe antimicrobials without culture and sensitivity. There are use of antibiotics both in flourishing livestock and aquaculture industries. - All these factors have been contributing to consistent increase in antimicrobial resistance in the country.

Measures has been taken regarding Antimicrobial resistance in Bangladesh

- Drafting of Strategy for prevention and containment of antimicrobial resistance(human health) only by the Director general of health service(DGHS)
- Formation of national steering and technical committee
- Drafting of Institutional antimicrobial guideline e.g, Dhaka Medical College, BSMMU etc.

Challenges of control and prevention of Anti microbial resistance in Bangladesh

1. Lack of awareness of AMR
2. Lack of national strategy (animal health)of AMR
3. Lack of national action plan of AMR
4. Inadequate implementation of rules and regulations of AMR.
5. Lack of multi-sectoral collaboration for AMR
6. Insufficient (only some institutions e.g., IEDCR)surveillance data for AMR
7. Misuse ,overuse,prolonged and inadequate use of antimicrobials in humans and animals
8. Insufficient laboratory capacity for detecting AMR
9. Presence of multi-drug resistant microbes
10. Inadequate resources (technical & financial)
11. Absence of sufficient research on resistant microbes
12. Sharp animal husbandary practices

Ways Forward to prevent Antimicrobial resistance(AMR) in Bangladesh

1. Setup & Enforcement of rules and regulations including political commitment for AMR
2. Development of action plans and guidelines for AMR
3. Setup and Strengthening –multi-sectoral network, nationally and internationally through member states & stakeholders for AMR
4. Awareness,sharing information development and advocacy of AMR
5. Improve animal husbandry practice at production level
6. Identify the gaps and encouragement of research on AMR & provision of technical support from AP region
7. Strengthen AMR surveillance, lab capacity and network development-GHSA action package prevent-1
8. Provision of adequate funding for AMR(detection,surveillance&networking)by government and developing partners
9. Detecting and controlling antibiotic-resistance requires the adoption of a “One-Health” approach to AMR surveillance that recognizes that resistance can arise in humans, animals,foods and the environment
10. Implementation of evidence-based infection control practices(e.g., Hand hygiene, biosafety,bio-secuirity issuses) can lowers and prevent the spread of resistant pathogens.

11. Need Mapping and 5years road map for AMR
12. Need global partnership for containment of antimicrobial resistance and requires more attention between the member states of AP regions to global health security issues (GHSA action package prevent-1)and more collaboration, because infectious microbial pathogens do not recognize borders.Need to work regarding global health security agenda issues
13. Finally, need to travel a long way to be able to prevent and control antimicrobial résistance

Conclusion:

It is a new emergency momentum of one health movement covering the area from policy to issue, food security to AMR and emerging infectious disease event thought out the world. This is emphasizeed that this unified thinking in Bangladesh also would help to move forward to achieve the sustainable development goals through One Health approach.

(Sir Salimullah Med Coll J 2016; 24: 1-3)

Akhtarun Naher[1], Sadia Afroz[2], Khadeza Khatun[2]

[1]Professor and Head, Department of Microbiology, SSMC& Mitford Hospital, Dhaka-1100, [2]Assistant Professor, Department of Microbiology, SSMC & Mitford Hospital, Dhaka-1100. E-mail: akhtnaher@yahoo.com

References

1. O'Neill J. Antimicrobial resistance: tackling a crisis for the health and wealth of nations. Rev Antimicrob Resist. 2014. http://amr-review.org/Publications.
2. Mossialos E, Morel CM, Edwards S, Berenson J, Gemmill-Toyama M, Brogan D. Policies and Incentives for Promoting Innovation in Antibiotic Research. Copenhagen: World Health Organization and Swedish Ministry of Social affairs and Health; 2010.
3. Matthiessen L. Infectious Disease Financing Facility (IDFF). Horizon 2020 SC1 Advisory Group for the "Health, demographic change and well-being". Brussels: European Commission; 2015.
4. O'Neill J. Securing New Drugs for Future Generations: The Pipeline of Antibiotics. London: Wellcome Trust; 2015.
5. Renwick M, Brogan D, Mossialos E. A Critical Assessment of Incentive Strategies for Development of Novel Antibiotics. J Antibiot. 2015; doi: 10.1038/ja.2015.98
6. Morel CM, Mossialos E. Stoking the antibiotic pipeline. BMJ. 2010;18(340):c2115.
7. Sharma P, Towse A. New drugs to tackle antimicrobial resistance: analysis of EU policy options. London: Office of Health Economics; 2010.
8. Munos B. Lessons from 60 years of pharmaceutical innovation. Nat Rev Drug Discov. 2009;8(12):959–68.
9. Cecchini M, Langer J, Slawomirski L. Antimicrobial Resistance in G7 Countries and Beyond: Economic Issues, Policies and Options for Action. Paris: Organization for Economic Co-operation and Development; 2015.
10. Harper M. The Truly Staggering Cost of Inventing New Drugs. Forbes, 2012. Available from: www.forbes.com/sites/matthewherper/2012/02/10/the-truly-staggering-cost-of-inventing-new-drugs/#2715e4857a0b70d756604477. Accessed on October 7, 2015.
11. DiMasi J, editor. Innovation in the Pharmaceutical Industry: New Estimates of R&D Costs. Boston: R&D Cost Study Briefing; 2014.
12. Avorn J. The $2.6 Billion Pill—Methodologic and Policy Considerations. N Engl J Med. 2015;372(20):1877–9.
13. Monnet DL. Antibiotic development and the changing role of the pharmaceutical industry. Int J Risk Safety Med. 2005;17(3):133–45.
14. Innovative Medicines Initiative. The IMI funding model Innovative Medicines Initiative. Brussels: European Commission; 2015. Available from: http://www.imi.europa.eu/content/imi-funding-model. Accessed on October 7, 2015.
15. Elmer C, Grossenbacher T, Gruhnwald S, Schafer M. The People Pay, Corporations Cash In: Problems Plague EU Medical Research Initiative. Der Spiegel. 2015;1:2015.
16. Garattini S, Bertele V, Bertolini G. A failed attempt at collaboration. BMJ. 2013;347:f5354.
17. Brogan D, Mossialos E. Applying the concepts of financial options to stimulate vaccine development. Nat Rev Drug Discov. 2006;5(8):641–7.
18. Brogan DM, Mossialos E. Incentives for new antibiotics: the Options Market for Antibiotics (OMA) model. Glob Health. 2013;9(1):58.
19. Russell PK. Project BioShield: what it is, why it is needed, and its accomplishments so far. Clin Infect Dis. 2007;45 Suppl 1:S68–72.
20. World Health Organization. Publicly Financed Global Consortium for R&D to Fight Antibiotic Resistance. Geneva: World Health Organization; 2014.
21. Joint Programming Initiative on Antimicrobial Resistance. Strategic Research Agenda. The Hague: Joint Programming Initiative on Antimicrobial Resistance; 2013.

Original Articles

Role of Triple Phase Spiral Computed Tomography Scan in the Evaluation of Hepatocellular Carcinoma and its Correlation with Histopathology

Rawnak Afrin[1], Md. Rued Hossain (Rubel)[2], Abdullah –Al-Amin[3], Bibekananda Halder[4], Asifa Sattar[5], Shyamol Kumar Roy[6], Ranajit Sen Chowdhury[7]

Abstract

Background: *Hepatocellular Carcinoma is the most common malignant neoplasm of the liver worldwide. As the clinical presentation is non-specific, the modern imaging modalities can play an important role in the diagnosis of HCC and the radiologist is often the first to suggest the correct diagnosis. Multiphase CT is considered the imaging technique of choice for the detection and staging of HCC. Among multiple scan phases in contrast-enhanced helical CT, it has been well established that hepatic arterial dominant phase scanning is essential for detecting hyper vascular HCC.*

Objective: *To evaluate the usefulness of Triple phase Spiral Computed Tomography scan in detection of Hepatocellular carcinoma (HCC).*

Materials and Methods: *This cross sectional study was carried out from July 2012 to June 2014, in the department of Radiology & Imaging, SSMC& Mitford hospital on total 54patients.*

Result: *The validity of Multiphase (triple phase) CT scan as diagnostic modality in the evaluation of HCC by calculating sensitivity were 97.1%, specificity 83.3%, positive predictive value 94.3% , negative predictive value 90.9% and accuracy 93.5%. Maximum 86.2% lesions were hyper attenuating in hepatic arterial phase (HAP).*

Conclusion: Triple *phase spiral computed tomography scan is a useful imaging modality for diagnosis & evaluation of hepatocellular carcinoma.*

Key words*: Multi-row Detector Computed Tomography (MDCT),Triple phase CT, Hepatocellular carcinoma(HCC).*

(Sir Salimullah Med Coll J 2016; 24: 5-9)

Introduction

The prevalence of hepatocellular carcinoma (HCC) is increasing worldwide. It is the fifth most common malignancy in men and eight in women. Epidemiologically, HCC is most common in Asia and sub- Saharan Africa.[1] In a majority of cases, HCC occurs in the setting of cirrhosis with underlying chronic viral hepatitis (B or C) or alcoholism and more recently with non-alcoholic steatohepatitis. Early detection and staging of HCC are necessary for the more effective triage of patients and in planning management strategies[2]. The aim of diagnostic imaging is to detect HCC at an early stage, when curative options are available. The advent of spiral MDCT (Multi-row Detector Computed Tomography) in recent years has

1. Assistant Professor, Institute of Nuclear Medicine & Allied Sciences, SSMCH.
2. Associate professor of Department of Radiology and Imaging, SSMC & Mitford Hospital.
3. Associate Professor, Radiology Imaging, SSMC & Mitford Hospital
4. Associate Professor, Radiology Imaging, SSMC & Mitford Hospital
5. Associate Professor, Radiology Imaging, SSMC & Mitford Hospital
6. Assistant Professor, Radiology Imaging, SSMC & Mitford Hospital
7. Associate Professor, Dept. of Medicine, SSMC & Mitford Hospital

Correspondence: Dr. Rawnak Afrin, Assistant Professor, Institute of Nuclear Medicine & Allied Sciences, SSMCH. E-mail: afrinrbd@gmail.com. Cell: 01914857542.

dramatically improved the ability to detect and stage HCC. It is less expensive than MRI and more accurate than Ultrasound. The advent of spiral/ helical CT made it possible to perform multi-phasic examination of the liver in the arterial and portal venous phase with the same bolus of contrast. This has had a major impact on the detection and characterization of hypervascular lesions like HCC. All multislice CT uses 3rd generation CT technology with multiple rows of detectors (MDCT) which allows multiple slice of images, recorded with a single rotation of tube. So that large volume of data can be taken at a time which permits options for image manipulation- like multi planner reformatting (MPR).

MPCT consists of different phases; biphase, triple phase, 4 phases[1]. Triple phase liver CT is used to detect and characterize liver lesions as different types of tumors enhance differently during each phase depending on whether they are hyper vascular or hypo vascular lesions. All liver tumors however get 100% of their blood supply from the hepatic artery, so when they enhance it will be in the arterial phase.

Materials and Methods

This cross sectional study was carried out from July 2012 to June 2014, a total of 24 months period in the department of Radiology & Imaging, SSMC& Mitford hospital. All the patients included in the study, who were referred to the department of Radiology & Imaging for Computed Tomography scan from OPD and IPD of different departments of SSMC & Mitford hospital as clinically diagnosed cases of hepatocellular carcinoma during the study period. Patients were selected irrespective of age & sex. Total 54 patients were included as study population.

Among 54 patients total 8 patients were excluded from the study group, among them 2 were excluded, who refused to go through biopsy , 5 were excluded for non availability of their biopsy report & one for having bleeding disorder. Finally 46 patients were included in the study. Clinical history, relevant data were collected in a pre - designed structured data collection sheet. Triple phase spiral CT scan was done on each patients. Triple phase CT scans of liver were performed with Somatom Emotion 16 slice, Siemens CT scanner . The whole liver scanning was followed by application of nonionic contrast agent, Iopamidol with a dose of 80-100 ml iopamidol at the concentration of 370mg/ml. Triple phase acquisition was performed with a scanning delay set for HAP, PVP and delayed phase at 30 s, 75 s and 300 s, respectively. Each of the whole liver scanning was done by cephala-caudal orientation. Triple phase CT scan findings were correlated with histopathological findings. Accuracy of triple phase spiral CT was calculated.

CT criteria for diagnosis of HCC (4)

The following criteria are found in single or in combination:

1. Hepatomas appear as solitary or multiple masses, or as a diffusely infiltrating lesion of liver.
2. On NECT most of the HCC appear as heterogenous hypodense lesion with mass effect.
3. Striking but transient early enhancement is common as lesions are vascular. Most of the HCC are enhancing during arterial phase as they gain blood supply from hepatic arteries and show rapid washout of contrast during portal venous phase and delayed phase.

In 2012, the EASL and the European Organization for Research and Treatment of Cancer (EORTC) updated EASL guidelines[5]. The new guidelines define the typical appearance of HCC on imaging as arterial-phase hypervascularity and portal venous or delayed-phase washout. Only one imaging modality is required for lesions measuring >2 cm. For 1–2 cm lesions, one modality is recommended when imaging is performed in centers of excellence with high-end technology and radiology expertise; two coincident modalities are recommended when imaging is performed outside such centers.

Results

Table I shows that HCC is common in forth and fifth decade of life.

Table I

Distribution of respondents according to age

Age	Frequency	Percentage
≤30	1	2.2
31 – 40	4	8.7
41 – 50	18	39.1
51 – 60	12	26.1
61 – 70	8	17.4
>70	3	6.5
Total	46	100.0

N.B. Multiple responses was possible. Table shows majority of the patients presented with the features of upper abdominal pain, 35 (76.1%) and anorexia & fatigue 35 (76.1%) out of 46 patient.

Table II
Distribution of patients according to clinical presentation

Clinical presentation	Frequency	Percentage
Upper abdominal pain	35	76.1
Fatigue/Anorexia	35	76.1
Weight loss	20	43.5
Hepatomegaly	35	76.1
Jaundice	8	17.4
Upper abdominal mass	18	39.1
Anaemia	14	30.4
Ascites	14	30.4

Table III shows maximum lesions are hypodense 45 (69.2%) in nature on NECT.

Table III
Distribution of lesions according to (Non contrast CT pattern) NECT (n=65)

NECT	Frequency	Percentage
Isodense	9	13.8
Hypodense	45	69.2
Hyperdense	7	10.8
Mixed density	4	6.2
Total	65	100.0

Table IV showing maximum 86.2% lesions were hyperdense on arterial phase.

Table IV
Distribution of lesions according to contrast enhancement pattern on arterial phase(n=65)

Contrast enhancement pattern on arterial phase	Frequency	Percentage
Hyperattenuation (total/partial)	56	86.2
Hypoattenuation	6	9.2
Isoattenuation	2	3.1
Total	65	100.0

Table V
Distribution of lesions according to contrast enhancement pattern on portal venous phase

Contrast enhancement pattern on portray venous	Frequency	Percentage
Hypoattenuation	52	80.0
Isoattenuation	10	15.4
Hyperattenuation	3	4.6
Total	65	100.0

Table IV shows maximum 35 (76.08%) cases were detected as HCC.

Table VI
Distributions of the study patients according to multiphase CT diagnosis (n= 46)

Multiphase CT Findings	Frequency	Percentage
HCC	35	76.08
Hepatic Adenoma	2	4.37
Metastasis	4	8.66
Cholangiocarcinoma	2	4.37
Abscess	3	6.52
Total	46	100.0

Table VII shows maximum 33 (71.73%) cases were detected as HCC on histopathological findings and rest are others.

Table VII
Distributions of the study patients according to Histopathology findings

Histopathological findings	Frequency	Percentage
HCC	33	71.73
Focal nodular hyperplasia	2	4.37
Adenoma	1	2.12
Metastasis	6	13.04
Cholangiocarcinoma	2	4.37
Abscess	2	4.37
Total	46	100.0

Table VI shows the distribution of CT diagnosis by histopathological diagnosis. Out of all cases 35 were diagnosed as HCC by CT and among them 33 were confirmed by histopathological evaluation. They are true positive. Other two cases are false positive. Out of 11 cases of non HCC which were confirmed by CT, one was confirmed as HCC and 10 were non HCC by histopathological findings. They are false negative and true negative respectively.

Table VIII

Comparison between histopathological test and multiphase CT diagnosis

CT	Histopathology		Total
	HCC	Non HCC	
HCC	33 (97.1)	2 (16.7)	35 (76.1)
Non HCC	1 (2.9)	10 (83.3)	11 (23.9)
Total	34 (100.0)	12 (100.0)	46 (100.0)

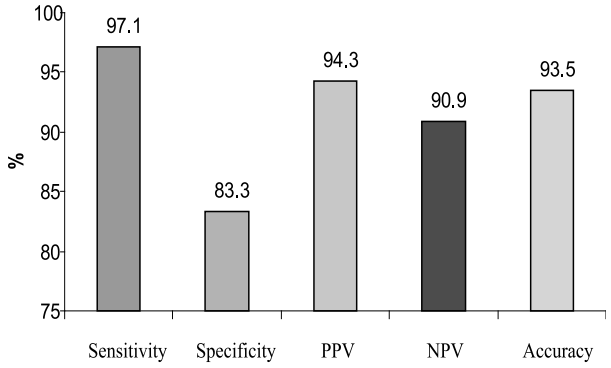

Fig.-2: *Bar diagram shows validity of multiphase CT scan in diagnosis of HCC*

Discussion

Hepatocellular Carcinoma is the most common malignant neoplasm of the liver worldwide. Definitive preoperative diagnosis of HCC remains a challenging problem for both the surgeon and radiologist. As the clinical presentation is non-specific, the modern imaging modalities can play an important role in the diagnosis of HCC and the radiologist is often the first to suggest the correct diagnosis.

In this study common age group affected by HCC was seen between 41 to 50 years Mean ± SD was 51.7 ± 11.4 and the range was 21 to 75 years.This findings is similar to what we have been found a study in Japan & another study in our country[7,8].

In the current study, higher male incidence, (male 89.1% and female 10.9% cases)was observed. This is similar to other studies[7,8].

In our study 60.9% cases were HBS Ag Positive & HCV positive cases were 6.5%, supported by another study in Bangladesh.[8]

In this study, a maximum of 60.9% cases had solitary, 34.8% cases had multifocal and 4.3% cases had diffuse lesion, similar to other study[8].

On evaluation of precontrast CTpattern in the current study it was observed that maximum 69.2% lesions were hypodense followed by13.8% lesions',10.8% lesions' and 6.2% lesions' on NECT were isodense, hyperdense and mixed dense respectively. Tanaka et al. found almost identical echo pattern.[9]

In present study the distribution of lesions by contrast enhancement pattern on arterial phase had recorded. Maximum 56 out of 65 (86.2%) lesions were total or partially hyperattenuating, followed by 9.2% lesions were hypoattenuatiing , and 3.1% lesions were isoattenuating. On portal venous phase 52/65 (80.0%) lesions showed hypo-attenuation, 10/65 (15.4%) lesion showed isoattenuation, and 03/65 (4.6%) lesions hyperattenuation . Maximum 52/65 (80.0%) lesions' showed hypoattenuation, 8/65 (12.3%) lesions', and 05/65 (7.7%) lesions' showed isoattenuation & hyper attenuation respectively on delayed phase. J.yaqoob et,al, showed 85% lesions were detected on HAP (81% hyperattenuating, 4% hypo-attenuating) on HAP images.[10] Lee et al, found in their series that 86% lesions shoed hyper-vascularity on arterial phase, 76% lesions showed wash out of contrast on portal venous phase & about 80% of the lesons showed contr ast washout on delayed phase.[11] Ichikawa et al. showed 83% hypervascular lesions on arterial phase in their series. Contrast enhancement pattern of the current study closely correlate with the previous studies.[11]

Out of 46 cases 35 were diagnosed as HCC by triple phase CT scan and among them 33 were confirmed by histopathological evaluation .Sensitivity, Specificity, Positive predictive value(PPV), Negative predictive value (NPV) and Accuracy of the triple phase computed tomography scan were 97.1%, 83.3%, 94.3%, 90.9% and 93.5% respectively.

Recent investigations documented specificity rates of 80%-96% for contrast-enhanced CT in detecting HCC,compared with histological evaluation[12]. Bhartia et al. found a multiphase CT sensitivity exceeding 90% in evaluation of HCC[13]. Laghi et al. (2002) reported the average sensitivity and - positive predictive value of multiphase CT scan respectively, for the detection of hepatocellular carcinoma (HCC)were 87.1% and 94.0% for images from arterial phase, and 88.5% and 93.4% for images from all three phase.[14]

Conclusion

Contrast-enhanced triple phase helical CT has become the most commonly used screening tool for depicting hepatocellular carcinoma, mainly due to the increased ability of arterial phase enhancement to visualize early small lesions. As the triple phase spiral CT findings correlate well with the histopathological diagnosis, sensitivity, specificity, accuracy of triple phase CT scan for diagnosis of hepatocellular carcinoma is high and the validity tests are almost identical observed in other countries by many investigators, it can be concluded that triple phase spiral CT scan is a useful imaging modality in evaluation of HCC & can help the doctors in the rational approach of patient management in case of hepatocellular carcinoma.

References

1. Silverman PM, Szklaruk J. (2005) 'Controversies in imaging of hepatocellular carcinoma: Multidetector CT (MDCT)' *International Cancer Imaging Society* 5:178-187.
2. Digomarthy SR, Sahani DV, Saini S (2005) 'MRI in Detection of Hepatocellular Carcinoma (HCC)' *International Cancer Imaging Society* 5:20-24
3. Yu SCH, Yeung DTK, So NMC (2004) 'Imaging Features of Hepatocellular Carcinoma' *Clinical Radiology* 59:145-156
4. Dick R and Watkinson A, 2002, The liver and spleen, In: Sutton D, Robinson JA, Jenkins JPR, (7th editions) Textbook of Radiology and imaging, UK, vol. 2 p. 737-786.
5. www.easl.eu/.../clinicalpractice.quide.
6. Ichikawa T, Nakajima H, Nanbu A, Hori M, Araki T, 2006, 'Effect of injection rate of contrast material on CT of hepatocellur carcinoma', AJR, vol. 186, pp. 1413-1418.
7. Okuda, K; 1980. Primary liver cancer in Japan Cancer : 45(10) 2663-9.
8. Gani ABMS,Al- Mahbub M, Rahman S, AkbarSMM. Characteristics features of Hepatocellular carcinoma in Bangladesh & their public health implications. Europian J.Hepato-Gastroenterology 2013;3(1):28-30
9. Tanaka S, Kitamura T, Ohshima A, Umeda K, Okuda S, Ohitani T, Tatsuta M, Yamamoto K, 1986, 'Diagnostic accuracy of ultrasonography for hepatocellular carcinoma', Cancer, vol. 58, pp. 344-347.
10. yaqoob,V.Bari,U.Usman,K.munir,F.Mosharraf,W. Akhter The Evaluation of Hepatocellular Carcinoma with Biphasic Contrastenhanced Helical CT Scan (JPMA 54:123;2004.
11. Lee KH, Malley MEO, Haider MA, Hanbidge A, 2004, Triple-phase MDCT of hepatocellular carcinoma', , AJR Am J Roentgenol. 2004 Mar;182(3):643-9.
12. Talwalkar JA, Gores GJ. (2004) "Diagnosis and staging of hepatocellular carcinoma". *Gastroenterology*; 127: S126-S132
13. Bhartia B, Ward J, Guthrie JA, Robinson PJ, 2003, 'Hepatoceliular carcinoma in cirrhotic livers: double-contrast thin-section MR imaging with pathologic correlation of explanted tissue', AJR, vol. 180, pp. 577-584.
14. Laghi A, lannaccone R, Rossi P, Carbone I, Ferrari R, Mangiapane F, Nofroni I, Passariello R, 2003, 'Hepatocellular carcinoma: detection with triple-phase multi-detector row helical CT in patients with chronic hepatitis', Radiology, vol. 226, pp.543-549.

Comparison between Actual Birth Weight (ABW) and Ultrasonographic Estimated Fetal Weight (US-EFW)

Parul Akhter[1], Sharmin Sultana[2], Masuda Sultana [3], Jahangir Alam[4], Kamrunnahar Dipa[5]

Abstract

Background: *Accurate estimation of birth weight is paramount in planning perinatal care, especially in cases of prematurity, growth restriction or significant growth discordance. Ultrasonography is an important tool for prediction of birth weight.*

Objective: *To compare ultrasongraphic estimated fetal weight with actual birth weight.*

Methods: *This prospective observational study was conducted in a private clinic over a period of one year from January 2015 to December 2015 on 300 term pregnant women. USG was done by expert sinologist for estimation of fetal weight just before delivery. Birth weight was taken just after delivery.*

Results: *In this study, mean age of the study subjects was 24.38 ± 4.47 years and mean gestational age was 38.04 ± 1.09 years. Mean actual birth weight (ABW) of the infants was 2.74 ± 0.34 kg and mean ultrasonographic estimated fetal weight (US-EFW) was 2.61 ± 0.31 kg. Mean difference of actual birth weight and ultrasonographic estimated fetal weight was 0.13 ± 0.20 kg. Mean percentage of error was 4.59 ± 7.40% and mean absolute percentage of error was 7.39 ± 4.58%. According to US-EFW, 69.3% of infants were within ± 10% of actual birth weight. Our correlation coefficient for ultrasound estimation was 0.816.*

Conclusion: *It can be concluded that ultrasonographic estimated fetal weight is closer to actual birth weight.*

Keywords: *Actual birth weight, ultrasonographic estimated fetal weight*

(Sir Salimullah Med Coll J 2016; 24: 10-13)

Introduction

Normal intrauterine fetal growth and birth weight both are related with babies' growth, development, intelligence and disease in rest part of his/her life. An important component of maternity care management especially in planning of delivery mode is estimation of fetal weight.[1] Birth weight is strongly associated with perinatal outcome. The perinatal complications associated with low birth weight are attributable to preterm delivery, intrauterine growth restriction (IUGR), or both. Macrosomic infants are at risk of shoulder dystocia and brachial plexus injury during labour.[2] These infants are more likely to undergo operative vaginal delivery and Caesarean delivery. These complications may be potentially limited by an accurate estimation of the fetal weight at term, which may facilitate a planned and safe delivery. When there is chance of delivering a very low birth weight baby, optimal route of delivery, or the level of hospital where delivery should occur may be based wholly or in part on the estimation of the expected birth weight.[3] In order to prevent the adverse outcomes of macrosomia, accurate estimation of fetal weight is very important. It is also very important in the management of labor and delivery.[3]

The two main methods for predicting birth-weight are: (a) clinical techniques based on abdominal palpation of fetal parts and calculations based on fundal height and (b) sonographic measures of

1. Assistant Professor, Sir Salimullah Medical College, Mitford, Dhaka.
2. Rupgonj Health Complex, Narayanganj.
3. Junior Consultant, 300 Bedded Hospital, Narayanganj.
4. Senior Consultant, 300 Bedded Hospital, Narayanganj.
5. MS (Gyane), Consultant Gynae.

Address of Correspondence: Dr. Parul Akhter, Assistant Professor, Sir Salimullah Medical College, Mitford, Dhaka.

skeletal foetal parts which are then inserted into regression equations to derive estimated fetal weight.[4] Some studies found sonographic estimation was superior to clinical estimation and some found both methods were similar in accuracy.[4,5]

Ultrasonographic estimation of fetal weight has been used for decades and the principle of this is that the sonographic measurements of multiple linear and planar dimensions of the fetus provide sufficient parametric information to allow for accurate algorithmic reconstruction of the three-dimensional fetal volume of varying tissue density. Various formulas have been used to assess fetal weight estimation. The Hadlock formula is pre-programmed in the ultrasound machine used in our Department. Fetal bi-parietal diameter, fetal abdominal circumference and fetal femoral length are used to estimate the fetal weight. This formula has been found most predictive in the studies of Zayed and Abu-Heija[6] and Bhandary et al.[7]

Methods

This prospective observational study was conducted in a private clinic over a period of one year from January 2015 to December 2015. This study included 300 pregnant women at term with proper consent. Multiple pregnancy and congenital anomaly cases were excluded from this study. Accurate dating from LMP was done. USG was done in a reliable and same diagnostic centre. USG was done for estimation of fetal weight just before delivery. Birth weight was taken just after delivery.

Result

Mean age of the study subjects was 24.38 ± 4.47 years within the range of 18-39 years. Mean gestational age was 38.04 ± 1.09 years within the range of 36-40 years. Mean biparietal diameter (BPD) was 88.72 ± 2.00 mm within the range of 83 – 93mm. Mean actual birth weight (ABW) of the infants was 2.74 ± 0.34 kg within the range of 1.5 – 4.00 kg. Mean ultrasonographic estimated fetal weight (US-EFW) was 2.61 ± 0.31 kg within the range of 1.48 - 3.65kg. Mean difference of actual birth weight and ultrasonographic estimated fetal weight was 0.13 ± 0.20 kg within the range of -0.33 – 0.57 kg. Mean percentage of error was 4.59 ± 7.40% within the range of -14.21 – 18.87%. Mean absolute percentage of error was 7.39 ± 4.58% within the range of 0.0 – 18.87%. According to US-EFW, 35.0% of infants were within ± 5% of actual birth weight, 69.3% of infants were within ± 10% of actual birth weight and 95.3% of infants were within ± 15% of actual birth weight. Our correlation coefficient for ultrasound estimation was 0.816.

Table I

Demographic characteristics of the study population

Parameter	Mean ± SD	Min - Max
Age (years)	24.38 ± 4.47	18 - 39
GA (weeks)	38.04 ± 1.09	36 - 40
AFL	12.45 ± 8.65	1.90 – 117.00
Biparietal diameter (BPD)	88.72 ± 2.00	83 - 93
Actual birth weight (kg)	2.74 ± 0.34	1.50 – 4.00
US-EFW (kg)	2.61 ± 0.31	1.48 – 3.65
Difference (kg)	0.13 ± 0.20	-0.33 – 0.57
% of error	4.59 ± 7.40	-14.21 – 18.87
% of error (absolute)	7.39 ± 4.58	0 – 18.87

Table II

Percentage of US-EFW within a certain range of ABW

% US-EFW within ± 5% of ABW	35.0
% US-EFW within ± 10% of ABW	69.3
% US-EFW within ± 15% of ABW	95.3
% US-EFW within ± 20% of ABW	100.0

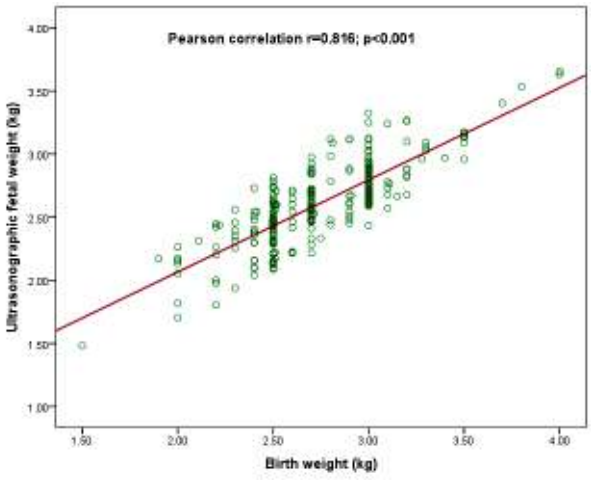

Fig.-1: *Scatter diagram shows co-relation between US-estimated fetal weight (US-EFW) and actual birth weight (in kg) and a linear association between both variables.*

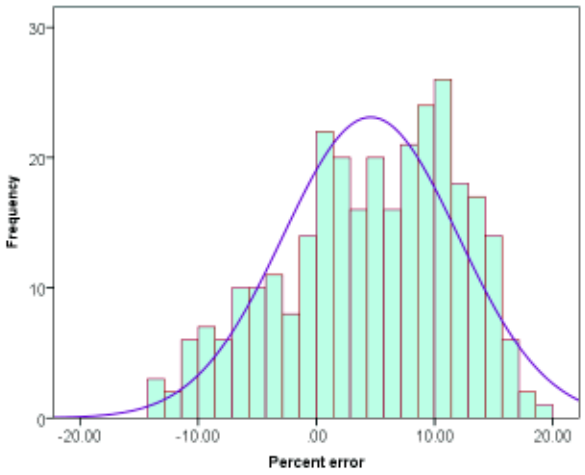

Fig.-2: *Distribution of US-EFG percentage error*

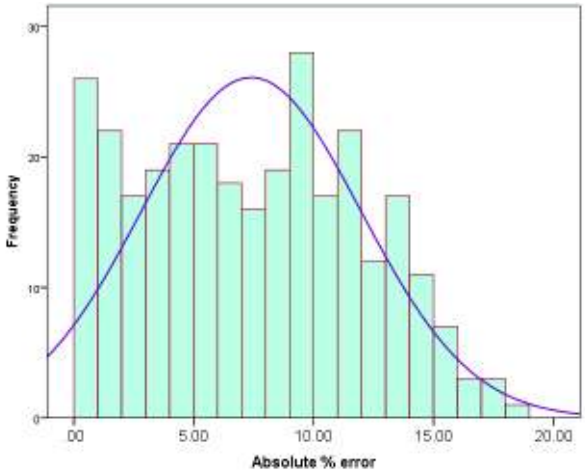

Fig.-3: *Distribution of US-EFG absolute % error*

Discussion

Fetal weight estimation is utmost important in the management of pregnancy especially in high risk pregnancy. It is very important in management of diabetic pregnancy, VBAC, Breech presentation, IUGR, PROM and premature labour. Birth weight is a major determinant of infant morbidity and mortality. In our study, mean age of the study subjects was 24.38 ± 4.47 years within the range of 18-39 years. Mean gestational age was 38.04 ± 1.09 years within the range of 36-40 years. Similar mean age and gestational age was found in the study of Hiwale et al[8]. Mean difference of actual birth weight and ultrasonographic estimated fetal weight was 0.13 ± 0.20 kg within the range of -0.33 – 0.57 kg. Mean percentage of error was 4.59 ± 7.40% within the range of -14.21 – 18.87%. Mean percentage of error was found 5.1±12.51% in Ugwu et al.[9] and 8.06±10.11% in Hiwale et al[8]. Mean absolute percentage of error was 7.39 ± 4.58% in our study which was also consistent with Wu et al.[10], Shittu et al.[3] and Nahum[11] (6.0% - 12.0%). According to US-EFW, 69.3% of infants were within ± 10% of actual birth weight. Similarly, 40-75% of the estimates were within 10% of actual birth-weight.[3,8,11] Our correlation coefficient for ultrasound estimation (0.816) is comparable with that of Ugwu et al., [9] (0.690), Solomon et al.[12] (0.073), Shittu et al.[3] (0.740) and Uotila et al.[13] (0.770).

Conclusion

There is good correlation between ultrasonographic estimation of fetal weight and actual birth weight. So it can be concluded that ultrasonography can be used to predict birth weight because estimated fetal weight by ultrasongraphy is closer to actual birth weight. But its accuracy entirely depends on the sonologist's skill.

References

1. Chauhan SP, Magann EF. Screening for fetal growth restriction. Clin Obstet Gynaecol 2006;49:284 94.
2. Wilcox AJ, Skjaerven R. Birth weight and perinatal mortality: the effect of gestational age. Am J Public Health 1992; 82: 378"82.
3. Shittu AS, Kuti O, Orji EO, Makinde NO, Ogunniyi SO, Ayoola OO, et al. Clinical versus sonographic estimation of fetal weight in southwest Nigeria. J Health Popul Nutr 2007;25:14 23.
4. Hendrix NW, Grady CS, Chauhan SP. Clinical versus sonographic estimates of birth weight in term of parturients. A randomized clinical trial. J Reprod Med 2000;45:317-22.
5. Mehdizadeh A, Alaghehbandan R, Horsan H. Comparison of clinical versus ultrasound estimation of fetal weight. Am J Perinatol 2000;17:233- 6.
6. Zayed F and Abu-Heija A. A comparison between ultrasound and clinical methods for predicting fetal weight. J Obstet Gynaecol 1999; 19:159"61.
7. Bhandary A, Pinto P, ShettyA. Comparative studies of various methods of fetal weight estimation at term pregnancy. J Obstet Gynecol Ind 2004; 54: 336"9.
8. Hiwale SS, Misra H, Ulman S. Ultrasonography-based Fetal Weight Estimation: Finding an Appropriate Model for an Indian Population. Journal of Medical Ultrasound. 2016:1-9

9. Ugwu EO, Udealor PC, Dim CC, Obi SN, Ozumba BC, Okeke DO, Agu PU. Accuracy of clinical and ultrasound estimation of fetal weight in predicting actual birth weight in Enugu, Southeastern Nigeria. Nigerian journal of clinical practice. 2014 May 1;17(3):270-5.

10. Wu M, Shao G, Zhang F, Ruan Z, Xu P, Ding H. Estimation of fetal weight by ultrasonic examination. International journal of clinical and experimental medicine. 2015;8(1):540-545.

11. Nahum G. Estimation of fetal weight—a review article last updated on 11 July 2002. (http://www. emedicine. com, accessed on 28 March 2003).

12. Solomon B, O'Reilly G, Arrabal P, Schwartz D, Contag S. 100: Comparing estimated fetal weight by ultrasound and clinical assessment with actual birthweight. American Journal of Obstetrics and Gynecology. 2013;1(208):S56-7.

13. Uotila J, Dastidar P, Hannone T, Ryymin R, Punonen R, Laasonan E. Magnetic resonance imaging compared to ultrasonography in fetal weight and volume estimation in diabetic and normal pregnancy. Acta Obstet Gynaecol Scand 2000;79:255-9.

Weighing up - Mental Trauma due to Domestic Violence in Rural Women of Reproductive Age

Afshan Zareen[1], Mobarra Akhter Zakaria[2]

Abstract

Bangladesh, having patriarchal pattern, is one of the highly populated countries in the world where number of women are more than that of men. This descriptive type of cross sectional study was carried out in some villages of Keraniganj, Dhaka from March to June 2016. A total of 201 rural women of reproductive age (15-49 years) were selected purposively. A pretested questionnaire was used for the study. The data was collected by face to face interview of the respondents. After collection, data were checked and verified. Omission and errors were corrected properly. Data was analyzed by using Social Package for the Social Sciences (SPSS version 22) and was represented in tables. About 87(47.3%) age of women ranged from 25-34 years with mean age of 28.75 years and SD±7.54 experiencing domestic violence and 6(35.30%) with mean age of 29.05 years and SD± 8.89 did not experience any domestic violence. Majority 174(86.6%) suffered from mental trauma due to domestic violence. Most of the women suffering from mental trauma due to domestic violence 115 (62.5%) with mean age of 29.8 years with SD±8.10 weighed mental trauma to be casual. Majority 161(80.1%) were housewives, 7(3.5%) were unemployed and rest 33(16.4%) had different types of jobs. Most 99 (63.5%) not working women and 16 (57.1%) working women took mental trauma caused by domestic violence to be casual (P>0.05) . Most 83(41.3%) studied up to primary level (class I-V) and only 8(4%) studied up to HSC or equivalent and 6(3%) studied up to Graduation or equivalent. There was no statistical association between age and weighing up mental trauma. And also there was no statistical association between occupation and weighing up mental trauma (P >0.005).

Key Words: *Weighing up, Mental trauma, Domestic violence.*

(Sir Salimullah Med Coll J 2016; 24: 14-19)

Introduction

Violence in married life and within the families is perceived as most undesirable situation for women. Because at home where they should have security and healthy position, instead women usually have threats of possible intentional attacks by the closest ones. Which consequently have physical impact as well as mental tolls. Female homicides, maternal mortality, injuries, pain, dizziness, memory loss, problems with working and carrying out daily activities are the direct health problems for women in Bangladesh caused by domestic violence leading to mental trauma. Most of the physically violated women suffer injuries leading to mental trauma. Injuries caused by physical as well mental violence by spouse or other members of the family if living in joint or extended family adversely affect the health of women which sometimes even cause death of many women. Studies showed that almost half household deaths of women in Bangladesh occur for serious beating by husband. Besides, domestic violence carries a risk of death by prompting the idea of meaningless life which encourage women to kill themselves. Physically and or sexually violated women face different reproductive health problems such as pelvic pain, reproductive tract infections, symptoms of irritable bowel syndrome gynecological problems at the time of pregnancy, miscarriage and low birth weight babies, low rate of contraceptive use, even abusive husbands suffer from sexually transmitted diseases that ultimately makes women vulnerable to STD as well as fear, anxiety, fatigue, post-traumatic stress disorder, sleeping disturbances and eating disorders are the common psychological problems suffered by abused woman. [1]

1. Associate Professor & Head, Department of Community Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka.

2. Lecturer, Department of Community Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka.

Address of correspondence: Dr Afshan Zareen, Associate Professor and Head, Departrment of community medicine, Sir Salimullah Medical College, Mitford, Dhaka. Cell no: +8801746439704, Email address: zareen1910@yahoo.com.

Domestic violence has economic impact as well but this is not well addressed in studies especially in developing countries, though this is very important for the community and country. The US centers for disease control and prevention identified direct and indirect costs of domestic violence including health care, judicial and social services and value of loss of productivity from work and deaths of the victims. In 1995 domestic violence expenses billions of USD for health care services in the United States. [2] In Bangladesh, there is still no such data to estimate the economic costs due to domestic violence.

Trauma is often the result of an overwhelming amount of stress that exceeds one's ability to cope or integrate the emotions involved with that experience. A traumatic event involves one experience, or repenting events with the sense of being overwhelmed that can be delayed by weeks, years, or even decades as the person struggles to cope with the immediate circumstances, eventually leading to serious, long-term negative consequences, often overlooked ever by mental health professionals: "If clinicians fail to look through a trauma lens and to conceptualize client problems as related possibly to current or past trauma, they may fail to see that trauma victims, young and old, organize much of their lives around repetitive memories, reminders, and affects."

Methods

The current study is a cross sectional type of descriptive study. The study was carried out in different households in rural area of Keraniganj Upazilla of Dhaka district from March 2016 to June 2016. The study population comprised of married women of reproductive age group (15-49 years) with a sample size of 201. Purposive sampling technique was adopted. A pre-tested structured questionnaire was prepared keeping in view the variables and objectives of the study. Women beyond reproductive age (15-49 years) and unmarried women were excluded from the study. Data was collected by face to face interview of the respondents by the researchers during data collection period. After collection, data were checked and verified. Omission and errors were corrected properly. Data was analyzed by using Social Package for the Social Sciences (SPSS version 22) and was represented in tables.

Results

Table I

Distribution of respondents according to age (n=201)

Age (years)	Domestic violence		p value
	Yes	No	
15 – 24	49 (26.6)	5 (29.4)	0.771#
25 – 34	87 (47.3)	6 (35.3)	
35 – 44	42 (22.8)	5 (29.4)	
>=45	6 (3.3)	1 (5.9)	
Total	184 (100.0)	17 (100.0)	
Mean ± SD	28.75 ± 7.54	29.05 ± 8.89	0.875##
Range (min-max)	16 - 60	16 - 45	

#Chi square test was done to measure the level of significance. ##Unpaired t test was done to measure the level of significance.

The Table indicated that domestic violence is significantly associated with age categories. It is notable that there is no mean age difference between domestic violence categories. There is a remarkable percentage of domestic violence in 25-34 years age category whereas very negligible percentage is more than 45 years. It also showed that similar pattern of domestic violence is present in 15-24 and 35-44 age categories.

Table II

Frequency of domestic violence

Domestic Violence	Frequency	Percentage
Yes	184	91.5
No	17	8.5
Total	201	100.0

The table showed that most of the respondents experience any domestic violence and only a few number of the respondents did not experience domestic violence.

Table III

Types of domestic violence

Types of domestic Violence	Frequency	Percentage
Mental	174	86.6
Physical	81	40.3
Sexual	4	2.0
Economical	3	1.5

*Multiple responses

The table depicted that most of the respondents suffered from mental trauma due to domestic violence. The second large category suffered from physical violence. The number of respondents suffering from sexual and economical violence was negligible.

Table IV

Showing how the respondents weighed mental trauma due domestic violence.

Weighing up the mental violence	Frequency	Percentage
Casual	115	62.5
Moderate	40	21.7
Seriously	26	14.1
Very seriously	31	1.6
Total	84	99.9

The table indicated that most of the respondents weighed mental trauma casually. The number of respondents weighing up mental trauma moderately and seriously were nearly same. A very few respondents took it metal trauma to be very seriously.

Table V

Distribution of respondents according to educational status(n=201)

Educational status of the respondents	Frequency	Percentage
Illiterate	26	12.9
Only able to put signature	37	18.4
Only able to read Arabic	5	2.5
Primary (Class I-V)	83	41.3
SSC or equivalent	34	16.9
HSC or equivalent	8	4.0
Graduate or equivalent	6	3.0

The above table pointed up that maximum number of respondents studied up to primary level. Rest of them were only able to put signature, studied up to SSC or equivalent, were illiterate respectively. Only a few were able to read Arabic, studied up to HSC or equivalent and studied up to Graduation or equivalent.

Table VI

Showing association of weighing up of mental violence with age of the respondents.

Weighing up the mental violence	n (%)	Age (Mean ±SD)
Casual	115 (62.5)	29.80 ± 8.10
Moderate	40 (21.7)	27.70 ± 6.20
Seriously	26 (14.1)	26.40 ± 6.10
Very seriously	3 (1.6)	23.30 ± 2.90

The above table illustrated that there is no statistical association between age and weighing up mental trauma. The casual category showed that the top most frequencies of weighing up the mental violence whereas very few percentage existed in very seriously category, Other two indicators are nearly similar.

Table VII

Distribution of respondents according to occupation (n=201)

Occupation of the respondents	Frequency	Percentage
Housewife	161	80.1
Unemployed	7	3.5
Domestic aid	11	5.5
Working in garments industries	5	2.5
Non-Govt. service holder	12	6.0
Others	5	2.5

The above table showed that most of the respondents were housewives. The percentage of unemployed and Non-Govt service holders were almost similar. Those in the unemployed categories, working in garments industries and others are almost equal in number.

Table VIII

Association of occupation with weighing up the mental violence by victim (n=184)

Weighing up the	Occupation		p
mental violence	Not working	Working	value
Casual	99 (63.5)	16 (57.1)	0.783
Moderate	33 (21.2)	7 (25.0)	
Serious	22 (14.1)	4 (14.3)	
Very serious	2 (1.3)	1 (3.6)	

The above table depicted there was no statistically association between occupation and weighing up mental trauma (P >0.005). The casual category showed that the top most frequencies of e weighing up the mental violence whereas very few percentages existed in very seriously category, other two indicators are almost similar.

Discussion

This cross-Sectional type of descriptive study was carried out in rural area of keraniganj Upazilla under district of Dhaka. The purpose of study was to find out magnitude of domestic violence causing mental trauma among married women of reproductive age in that rural area.

About 184(91.5%) experienced domestic violence and 17(8.5%) did not experience domestic violence. About 87(47.3%)women were around the age of were 25-34 years with mean age of 28.75 years and SD±7.54 experienced domestic violence and 6(35.30%) with mean age of 29.05 years and SD±8.89 did not experience any domestic violence. Majority 174(86.6%) suffered from mental trauma due to domestic violence. The women of age range 15-24 and 35-44 years had almost similar analysis. The analysis shows that domestic violence is statistically significantly associated with age. The result is consistent with WHO studies which shows that 62% domestic violence occurs in rural areas. Moreover in Bangladesh 20%-75% women suffer from mental trauma as a consequence of domestic violence.[3,4,5]

Domestic violence results in various types of trauma, such as mental trauma, physical trauma, sexual and economical trauma. In the study it was observed that around 174 (86.6%) experienced mental trauma (most common form-insulting, humiliation in front of others and verbal threatening) against married women is extremely common and persistently practiced by their husbands in Bangladesh, as over 80% have ever experienced it in their life time with 72% in the past 12 months (VAW survey 2011). [6]

Approximately 81(40.3%) experienced physical violence. According to the result of VAW survey 2011 Sixty-five percent of married women reported that they have experienced physical violence committed by their current husbands during their lifetime.[6] About half of married women experienced such violence in the past 12 months.

About 4(2%) experienced sexual violence and 3(1.5) experienced economical violence. More than one-third (36.5%) of women experienced sexual violence perpetrated by their current husbands in their lifetime (VAW survey 2011).The recent prevalence is also high as one-fourth of married women reported such violence experienced during past 12 months. About half of ever married women have ever experienced economic violence while one third experienced in the past 12 months. About one third of women (33.7%) have paid dowry for the current marriage.[6]

Around 115 (62.5%) weighed it to be casual, 40 (21.7%) moderate, 26 (14.1%) seriously and only 3 (1.6%) very seriously. Most of them 115 (62.5%) weighed mental trauma to be casual. Most of the women 83(41.3%) studied up to primary level (class I-V). About 115 (62.5%) weighed it to be casual with mean age of 29.8 years with SD±8.10. On the contrary Women weighed mental trauma and other consequences of domestic violence to be casual in most of the cases. On the contrary other findings indicate a strong relationship between domestic violence and poor mental health.[7] About 80% of women who experienced mental or physical violence reported significant effects including posttraumatic stress disorder (PTSD) for a short or a long period. Women who have experienced violence are liable to suffer from PTSD three times more than who did not.[8] Women who have experienced violence or survivors of domestic violence have nearly double the risk for developing depressive symptoms, and three times the risk for developing major depressive disorder.[9] Mothers who experience Violence are nearly twice as likely to develop post-partum depression compared to mothers who have not been abused. Mothers reporting domestic violence are more likely to have a current diagnosis of depression.[10] Victims of domestic violence prone to commit suicide and attempts to commit suicide.[11]

The current study showed the association between age and weighing up mental trauma. About 115 (62.5%) weighed mental trauma to be casual with mean age of 29.8 years with SD ± 8.10. 40 (21.7%) weighed it moderate with mean age of 27.70 years and SD±6.20. 26 (14.1%) took it seriously with mean age of 26.40 years and SD± 6.10. Only 3 (1.6%)

took it very seriously with mean age of 23.30 years and SD±2.90. The analysis was not statistically significant.

Most 83(41.3%) studied up to primary level (class I-V). The second largest group 37(18.4%) were only able to put signature, 34(16.9%) studied up to SSC or equivalent, 26 (12.9%) were illiterate. About 5(2.5%) were able to read Arabic. Only 8(4%) studied up to HSC or equivalent and 6(3%) studied up to Graduation or equivalent. Low literacy rate of women contributes as an important factor of domestic violence. As uneducated women are economically less productive, typically they have to bargain for power in the family.[12] However, with the increase of literacy rate and employment of women there is decline in domestic violence, therefore mental trauma due to domestic violence also declined. In rural Bangladesh, during 2000-2002 female adult literacy rate was 43.2%.[13] By 2004, it increased to 45.8% and by 2005 it further improved to 47.9%. Therefore statistical data shows an increasing level of women's education in Bangladesh. Despite that incidents of violence against women for dowry in police stations was 274 cases in 2001-2002 and in 2002-2004 time period it was increased in a total of 832 cases.[14]

This analysis showed that out of 201 respondents highest percentage were housewives 161(80.1%), second highest were non-govt. service holders 12(6%), 11(5.5%) domestic aid, 7 (3.5%) were unemployed. Only 5(2.5%) were working in garments industry and in some other sectors. Both not working 99(63.5%) and working group 16(57.1%) took mental trauma casually. The percentage was 21.2% in not working and working 25% group among the respondents who took it moderately. The frequency of taking it seriously was 22 in working group and 4 in not working respondents respectively. Only a few percentage (1.3%) in not working group and (3.6%) in working group took it very seriously. There was no statistical significance between occupation and mental trauma ($p>0.05$).

Conclusion

Domestic violence is a multifaceted problem in Bangladesh starting long back with the onset of human history, it inflicts trauma on women from a number of perspectives. Several gaps in the existing studies of domestic violence are identified. As the current study delineates that there is no significant association between of age and weighing up mental trauma neither there is any statically significant relationship between occupation and mental trauma caused by domestic violence. All these has been suppressed for generations and women are allowed to cry alone for the misery and deprivation. This is the high time to make a move to enlighten women about their rights which is linked with occupation and age. As occupation is a result of education and step to develop foresight, age also gives knowledge regarding life and experience to lead an even better life.

Recommendations

It should be recommended that the women of rural Bangladesh should be made aware of their rights by educating them about this matter besides formal education. Simultaneously the women should be alerted about their rights in their workplaces. All these can be done by ensuring proper policy making and implementation of laws. Both the Government and Non-Government sectors should come forward to have shared responsibility which could be of short-term, medium-term and long-term.

References

1. Kimani, M. (2007). Taking on Violence against Women in Africa. Africa Renewal, 21(2),4. www.un.org/en/africarenewal/vol21no2/212-violence-aganist-women.html. Retrieved on 21/4/2016.

3. General Economics Division, Planning Commission, Government of the People's Republic of Bangladesh & UNDP Bangladesh. (2007). A Situation Analysis Report on Gender (MDG3)Bangladesh. http://www.undp.org.bd/projects/prodocs/PRS_MDG/Situation%20analysis_GENDER.pdf Retrieved on 21/4/2016.

3. UNIFEM. (2009). Domestic violence legislation and its implementation. An analysis for ASEAN countries based on international standards and good practices. http://www.unicef-icdc.org/publications/pdf/digest6e.pdf. Retrieved on 28/4/ 2016.

4. WHO. (2005b). WHO multi-country study on women's health and domestic violence against women, country findings, Bangladesh. Geneva: World Health Organization. http://www.who.int/gender/violence/who_multicountry_study/fact_sheets/Bangladesh2.pdf Retrieved on 28/4/ 2016.

5. WHO. (2005b). WHO multi-country study on women's health and domestic violence against women, country findings, Bangladesh. Geneva: World Health Organisation. http://www.who.int/gender/violence/who_multicountry_study/fact_sheets/Bangladesh2.pdf. Retrieved on 28/4/ 2016.

6. BBS. (2013). Violence Against Women Survey 2011. Dhaka, Bangladesh: Bangladesh Bureau of Statistics (BBS).

7. Kumar, S., Jeyaseelan, L., Suresh, S., Ahuja, RC. (2005). Domestic violence and its mental health correlates in Indian women. The British Journal of Psychiatry Jun 2005, 187 (1) 62-67; DOI: 10.1192/bjp.187.1.62. 29/4/ 2016

8. Fedovskiy, K., Higgins, S., Paranjape, A. (2008). Intimate partner violence: How does it impact major depressive disorder and post traumatic stress disorder among immigrant Latinas? Journal of Immigrant and Minority Health, 10(1), 45-51.

9. Beydoun, H.A., Beydoun, M.A., Kaufman, J.S., L, B, Zonderman, A.B. (2012). Intimate partner violence against adult women and its association with major depressive disorder, depressive symptoms and postpartum depression: A systematic review and meta-analysis. Social Science & Medicine, 75(6), 959-975.

10. Cerulli, C., Talbot, N.L., Tang, W., Chaudron, L.H. (2011). Co-occurring intimate partner violence and mental health diagnoses in perinatal women. Journal of Women's Health, 20(12), 17971803.

11. Boyle, A., Jones, P., Lloyd, S. (2006). The association between domestic violence and self-harm in emergency medicine patients. Emergency Medicine Journal, 23, 604–607.

12. Amin, S. (2008). Reforming Marriage Practices in Bangladesh. Promoting Healthy, Safe and Productive Transitions to Adulthood. http://www.popcouncil.org/pdfs/ TABriefs/PGY_Brief31_MarriageBangladesh.pdf. Retrieved on 29/4/ 2016

13. Khan, M. E., & Aeron, A. (2006). Prevalence, nature and determinants of violence against women in Bangladesh. The Journal of Family Welfare, 52: 33-51.

14. Sambisa, W., Angeles, G., Lance, P. M., Naved, R. T., & Thornton, J. (2011). Prevalence and correlates of physical spousal violence against women in slum and nonslum areas of urban Bangladesh. Journal of Interpersonal Violence, 26: 2592: 2618

Prevalence of Subclinical Hyperthyroidism in Bangladeshi Population

Dipali Biswas [1], Manilal Aich [2], Md. Asadur Rahman[3], DGM Akaiduzzaman[4], Md. Mizanur Rahaman[5], Obaidul Islam[5], Siddiqur Rahman[5]

Abstract

Background: *Subclinical hyperthyroidism is an increasingly recognized entity that is defined as normal serum free thyroxine and free tri-iodothyronine levels with thyroid-stimulating hormone level suppressed below the normal range and usually undetectable. The burden of thyroid disease in the general population is enormous. Here, the prevalence of subclinical hyperthyroid disease in the Bangladeshi population was critically studied.*

Materials and Methods: *The study was carried out at Sir Sallimullah Medical College & Mitford Hospital. Anthropometric data were collected including thyroid function profile (TSH, free T3 and free T4).*

Results: *Of the 680 patients in the study group, 165 were males and 515 were females, ranging from 21 to 60 years of age. Status of euthyroid, overt hyperthyroid, subclinical hyperthyroid, and low free T3 & T4 levels were seen in 70.74%, 12.65%, 10.44%, and 6.18% respectively in cases. The prevalence of subclinical thyroid disease was found to be 10.44%, with 2.4% in males and 8.04% in females; and being more prevalent in age group 21-40 years age compared to other age groups ($p<0.05$).*

Conclusion: *The prevalence of subclinical hypethyroidism amongst the suspected cases was 10.44 % which is much higher compared to the other parts of the world, with higher prevalence seen in females as compared to males. The reason(s) for such a high prevalence of hyperthyroidism in Bangladesh needs to be studied further.*

Key words: *Prevalence, Hyperthyrodism, FT3, FT4.*

(Sir Salimullah Med Coll J 2016; 24: 20-23)

Introduction

Thyroid disease is a common disorder previously thought to affect 1-2% of the United Kingdom adult population and its prevalence is affected by several factors such as age.[1] The epidemiology of thyroid disease and thyroid dysfunction remains unclear, especially when compared with other endocrine disorders[2] affecting about 300 million people worldwide and over half are presumed to be unaware of their condition[3] and is also a major health problem of Bangladesh with prevalence of nearly 30% of the population affected in Bangladesh alone. However, the prevalence and pattern of hyperthyroidism depend on ethnic, geographic, and environmental factors including iodine intake status.[3-5] Subclinical hyperthyroidism is an increasingly recognized entity that is defined as a normal serum free thyroxine and free triiodothyronine levels with a thyroid-stimulating hormone level suppressed below the normal range and usually undetectable.[6] The pathophysiology of subclinical hyperthyroidism relates to the sensitivity of the pituitary gland to respond to minor elevations in serum freeT3 and freeT4 levels. Although these vels remain within the normal range, minimal increase in these thyroxine and triiodothyronine are sufficient, not only to decrease the serum TSH level by several logarithms (from

1. Assoc. Prof. & Head of the Department, Department of Oral Anatomy & Physiology, City Dental College, Dhaka..
2. Professor & Head of the Department, Department of ENT & Head-Neck Surgery, SSMC & Mitford Hospital.
3. Registrar, Department of ENT & Head-Neck Surgery, SSMC & Mitford Hospital
4. Associate Professor, Department of ENT & Head-Neck Surgery, SSMC & Mitford Hospital.
5. Dept. of ENT & Head-Neck Surgery, SSMC&MH.

Address of Correspondence: Dr. Sharfuddin Mahmud, Registrar, Department of ENT&HNS, SSMCMH. Mobile: 01817544133, E-mail:*mahmudssmc@yahoo.com*

about 1.0 IU per mL (1.0 mU per L) to less than 0.01 IU per mL (0.01 mU per L]), but also to induce abnormalities in several organs, including the heart and bones.[6] There is a varying degree of reports of hyperthyroidism across the globe, particularly in Asian regions. A study by Akhtar et al reported 5.1% hyperthyroidism and 5.85% subclinical hyperthyroidism in all age groups.[7] An epidemiological survey from Cochin showed 1.6% subclinical and 1.3% overt hyperthyroidism in case subjects.[8] Another study by Gomez et al reported 58.2% hyperthyroidism (53.1% of which were T4 thyrotoxicosis, 12.5% T3 thyrotoxicosis and 34.4% had subclinical hyperthyroidism) and 8.2% of patients had iodine induced hyperthyroidism.[9] In a hospital-based study from Pondicherry, it was found that the prevalence of subclinical and overt hyperthyroidism was 0.6% and 1.2% of subjects respectively.[10] Similarly, another hospital-based study from Bangladesh, reported 9% of total hyperthyroidism including both 6% subclinical hyperthyroidism and 3% hyperthyroidism;[11] whereas study conducted and reported 24.8% hyperthyroid disorders, including 14.9% overt hyperthyroidism and 9.9% subclinical hyperthyroidism.[12] Due to the variations in the prevalence of hyperthyroidism including both overt- and subclinical hyperthyroidism, we aimed to study their prevalence in population of Bangladesh. To the best of our knowledge, this is the first study that has investigated the prevalence of subclinical hyperthyroid disease in population of Bangladesh; and its association with age and gender.

Materials and Methods

The study was carried out using data retrieved from the indoor and outdoor register maintained in the Department of ENT & Head-Neck Surgery, Sir Sallimullah Medical College& Mitford Hospital, Bangladesh, from July, 2014 to June 2015. Anthropometric data were collected including thyroid function profile (free T3, and free T4). Serum fT3 and fT4 were assessed in the biochemistry laboratory, Sir Sallimullah Medical College& Mitford Hospital, Bangladesh. The internal quality control was included in each batch of tests performed.

Statistical analysis

The data collected was analyzed using Excel 2007, Statistical Package for the Social Sciences (SPSS) for Windows Version 17.0 (SPSS Inc; Chicago, IL, USA). Data were analyzed using Student's t-test. All the data are mean ± SD. Two-sided $P < 0.05$ was considered to indicate statistical significance.

Results

Of the 680 patients in the study group, 165 were males (24.26%), 515 were females (75.74%).

Table-I

The status of thyroid disorders in the studied population

Cases	Frequency	Percentage
Euthyroidism	481	70.74
Overt Hyperthyroidism	86	12.65
Subclinical Hyperthyroidism	71	10.44
Low fT3 and fT4	42	6.18

Table 1. Percentage Distribution of Thyroid Disorders

Table-II

Comparison of % Prevalence of Subclinical hyperthyroidism in male and female population

Gender	Subclinical Hyperthyroidism (%)
Males	2.4
Females	8.04

Table-II shows the variation in % prevalence of subclinical hyperthyroidism in male and female population of Bangladesh. This study showed the prevalence of subclinical hyperthyroidism of 10.44%. Females showed higher prevalence of subclinical hyperthyroidism with 8.04% as compared to males with 2.4% ($p<0.05$).

Table-III

Comparison of Thyroid Hormone Levels in Males and Females

Thyroid Hormones	Males	Females	p Value
fT3	2.25 ±0.52	4.92± 5.13	<0.05
fT4	1.42 ±0.26	1.93± 1.91	<0.05

Table 3. Comparison of level of thyroid hormones (free T3 and free T4) in males and females. Serum fT3 and fT4 levels were significantly different in male and females.

Table-IV

Comparison of Thyroid Hormone Levels Among Different Thyroid Disorders

Thyroid Hormones	Euthyroidism	Overt Hyperthyroidism	Subclinical Hyperthyroidism
fT3	2.31 ±1.26	16.14 ±4.09	1.98± 1.28
fT4	1.26 ±0.51	5.09± 0.42	1.76± 0.27

Table-V

Comparison of Thyroid Hormone Level among Different Age Groups

Thyroid Hormones	0 -20 Years	21 -40 Years	41 -60 Years	> 60Years
fT3	3.13 ±4.01	4.19 ±4.97	3.98 ±5.09	3.96 ±3.51
fT4	1.86 ±1.19	2.23 ±1.68	1.76 ±1.57	1.56 ±1.29

Table 5. Comparisons of serum free T3 and free T4 levels among different age groups. The serum free T3 and free T4 levels showed variation in different age groups. Serum free T3 and free T4 levels in age groups between 21-40 years were found to be significantly increased as compared to 0 - 20 years, 41-60 years, and > 60 years age group (all $p<0.05$).

Discussion

Thyroid disorder is the major health problem associated with endocrine abnormalities worldwide. Our study showed 23.09% prevalence of total hyperthyroidism including both overt hyperthyroidism (12.65%) and subclinical hyperthyroidism (10.44%) in population of Bangladesh. The present study showed higher prevalence of hyperthyroidism in females as compared to males. This also corroborates with the study conducted by Mark et al who showed higher prevalence of subclinical hyperthyroidism in females compared to males.[13] Similarly, in the Whickham survey cohort, the mean annual incidence of hyperthyroidism in women was 0.8 per 1000 with no new cases detected in men.[14] Other cohort studies provide comparable incidence data, which suggests that many cases of hyperthyroidism remain undiagnosed in the community unless routine testing is undertaken.[15] In the large population study in Tayside, Scotland, 620 incident cases of hyperthyroidism were identified with an incidence rate of 0.77/1000 per year (95% CI): 0.70–0.84) in women and 0.14/1000 per year (95% CI: 0.12–0.18) in men.[2] The incidence rate showed that women were affected two to eight times more than men across the age range. Recent further analysis suggested that the incidence of thyrotoxicosis was increasing in women but not in men between 1997 and 2001.[16] However, contrasting result have been showed by Baral et al.[4] where they reported equal proportion of thyroid dysfunction in male and female.[4] Therefore, other factors, such as sex hormones and genetic differences, may have an influence on the free T3 and freeT4 findings. Our results also showed higher free T3 and free T4 levels in 21-40 years[17] age group as compared to other age groups. This result is similar to the NHANES III study which showed the prevalence being highest in those subjects aged 20-39 years.[17] Also, the peak age-specific incidence of Graves' disease was between 20 and 49 years in two studies.[18] However, this result is in contrast to the one conducted by Yadav et al who showed insignificant increase in free T3 and free T4 levels in all age groups.[12]

Conclusion:

Hence, from this study, it may be concluded that the people of Bangladesh have higher risk for hyperthyroid disorders, with higher prevalence being in females as compared to males. To the best of our knowledge, this is the first study that has investigated the prevalence of subclinical hyperthyroidism in population of Bangladesh; and its association with age and gender. Since the strengths of this study were modest, their clinical significance remains to be determined in prospective studies related to risk of cardiovascular disease and bone loss. A limitation of this study is

that it has a cross-sectional design; implicating cause-and-effect relationship cannot be discerned. Also, since it was a hospital-based study, the prevalence of thyroid dysfunction may not be applicable to the general population. However, we believe that its strength is due to the greater number of subjects of this study.

Recommendation

Further studies are required to characterize the reasons for this high prevalence of subclinical hyperthyroidism in population of Bangladesh. Extensive field-based countrywide epidemiological studies are necessary to provide accurate data about thyroid dysfunction in the community. Also, the people are required to be educated regarding the thyroid dysfunction cause and prevention methods to minimize the occurrence of thyroid disorders. Since, the analysis of a low TSH level and subclinical hyperthyroidism raises the controversial issue of screening, there should be recommendation about serum TSH concentration screening be instituted at age 35 years in both men and women and be repeated every five years[19] and of course, if symptoms develop or if risk factors are present (e.g., thyroid antibodies), more frequent testing may be in order.[20]

References

1. Tunbridge WMG, Evered DC, Hall R, et al. The spectrum of thyroid disease in a community: the Whickham survey. ClinEndocrinol 1977; 7: 481-483.
2. R. W. V. Flynn, T. M. MacDonald, A. D. Morris, R. T. Jung and G. P. Leese The Thyroid Epidemiology, Audit, and Research Study: Thyroid Dysfunction in the General Population The Journal of Clinical Endocrinology & Metabolism August 1, 2004 vol. 89 no. 8 38793884.
3. Peter PAS eds. Epidemiology of Thyroid dysfunction-hypothyroidism and hyperthyroididm. Thyroid International 2009; 2: 1-16.
4. Baral N, Lamsal M, Koner BC, et al. Thyroid dysfunction in eastern Bangladesh. South Asian J Trop Med Public Health 2002; 33: 638-641.
5. Aminorroaya A, Janghorbani M, Amini A et al. The prevalence of thyroid dysfunction in an iodine-sufficient area in Iran. Arch Iranian Med 2009; 12: 262 – 270.
6. Diene K. Shrier, Kenneth D. Burman. Subclinical Hyperthyroidism: Controversies in Management. Am Fam Physician 2002; 1;65(3):431-439.
7. Akhtar S, Khan AZ, Ahmed M, Osman L, Ahmad F, et al. Correlation of clinical presentation with investigations and operative findings in solitary nodule thyroid. Ann King Edward Med Uni 2001; 7: 158-61.
8. UshaMenon V, Sundaram KR, Unnikrishnan AG, Jayakumar RV, Nair V, Kumar H. High prevalence of undetected thyroid disorders in an iodine sufficient adult south Indian population. J Indian Med Assoc 2009; 107: 72–7.
9. Gómez de la Torre R, Enguix Armada A, García L, Otero J. Thyroid nodule disease in a previously endemic goiter area. Ann. Med. Int 1993; 10: 48789.
10. Abraham R, Murugan VS, Pukazhvanthen P, Sen SK. Thyroid Disorders in Women of Puducherry. Indian J ClinBiochem 2009; 24: 52–9.
11. Aryal M, Gywali P, Rajbhandari N, Aryal P, Pandeya DR. A prevalence of thyroid dysfunction in Kathmandu University Hospital, Bangladesh. Biomedical Research 2010;21: 411-15.
12. Yadav NK*1, Thanpari C2, Shrewastwa MK3, Mittal RK4, Koner BC5 Assessment of Thyroid Disorder in Far Western Part of Bangladesh: A Hospital Based Study. Bangladesh Journal of Medical Science 2012; 11:04.
13. Mark P. J. Vanderpump. The epidemiology of thyroid disease. Br Med Bull 2011; 99 (1): 39-51.
14. Vanderpump MPJ, Tunbridge WMG, French JM, et al. The incidence of thyroid disorders in the community: a twenty-year follow-up of the Whickham survey. ClinEndocrinol (Oxf) 1995;43:55-69.
15. Vanderpump MPJ. The epidemiology of thyroid diseases. In: Braverman LE, Utiger RD, editors. Werner and Ingbar's The Thyroid: A Fundamental and Clinical Text. 9th edn. Philadelphia: JB Lippincott-Raven; 2005. p. 398-496.
16. Leese GP, Flynn RV, Jung RT, et al. Increasing prevalence and incidence of thyroid disease in Tayside, Scotland: The Thyroid Epidemiology, Audit and Research Study (TEARS). ClinEndocrinol (Oxf) 2008;68:311-16.
17. Hollowell JG, Staehling NW, Flanders WD, et al. Serum TSH, T, and thyroid antibodies in the 4 United States population (1988 to 1994): National Health and Nutrition Examination Survey(NHANES III). J ClinEndocrinolMetab 2002;87:489-99.
18. Zimmerman MB. Iodine deficiency. Endocr Rev 2009;30:376-408.
19. Ladenson PW, Singer PA, Ain KB, Bagchi N, Bigos ST, Levy EG, et al. American Thyroid Association guidelines for detection of thyroid dysfunction. Arch Intern Med. 2000;160:1573–5.
20. Helfand M, Redfern CC. Screening for thyroid disease: an update. Ann Intern Med 1998;129:144–58.

Evaluation of Bacterial Vaginosis in Preterm Labour

Fahmida Haque[1], Tahmina Akther[2]

Abstract

Background *Bacterial vaginosis (BV) is a common cause of vaginal discharge in the reproductive age group. The patient characteristically presents with a profuse homogenous, white, nonviscous, malodorous, uniformly adherent vaginal discharge. BV is characterized by an overgrowth of a mixture of anaerobic bacteria (e.g. Bacteroides, Peptostreptococcus, Prevotella spp, mobiluncus) and Gardnerella vaginalis, that replace the normal vaginal lactobacilli. It was postulated that vaginal organism found in BV may first ascent into the choriodecidual space, preterm labour and delivery are then caused by an maternal and fetal response to inflammatory product of choriodecidual bacterial colonization.*

Objective*: This study was carried out to evaluate whether the presence of bacterial vaginosis is associated with preterm labour or not.*

Material and Method: *A case control study was conducted in the Department of Gynaecology and Obstetrics, Sir Salimullah Medical College, Dhaka during the period of January 2006 to September 2007 to evaluate the correlation of BV with preterm labour and its association with adverse pregnancy outcome. A total of 100 patients (50 cases and 50 control) were included in the study according to selection and exclusion criteria. Pregnant women with singleton pregnancy in preterm labour at a gestational age between 28 to 36 weeks both primi and multi comprised the case. Pregnant women with singleton pregnancy at a gestational age between 28-36 weeks both primi and multi who were not in labour comprised the control group. The women were selected by nonrandom or non-probability or purposive sampling. After taking informed consent complete history, clinical examination and vaginal samples were taken. BV was diagnosed by the presence of clue cells in the wet mount and confirmed by gram staining examination of smear which shows presence of clue cells and a shift from predominance of Lactobacillus morphotypes to predominance of Gardnerella vaginalis organism. Data was collected and presented in various tables and graphs and analyzed with SPSS. Chi square test was done to determine the P value. A two sided P value ·05 was considered significant at 95% confidence limit. Odds ratio and confidence limit was calculated to measure the risks. Multiple logistic regression were done to detect maximum likelihood estimates of adjusted odds ratio (95% CI).*

Result : *In this study women with BV showed a risk of having preterm labour 7.58 times higher than those of women without BV (Odds ratio =7.58 and 95% confidence limit is 1.59-3593). Statistically significant difference was observed in term of absence or presence of BV with status of labour (x^2=6.72, P=<0.01). Logistic regression analysis showed that BV remain associated with preterm labour (Odds ratio 8.95; 95% confidence interval 1.91 to 46.80) after adjusting with all others variables of preterm labour.*

Conclusion: *Presence of bacterial vaginosis is associated with an increased risk for preterm labour.*

Key Words*: Preterm labor, anaerobic bacteria, clue cells.*

(Sir Salimullah Med Coll J 2016; 24: 24-29)

Introduction

According to Andrews et al.[1] preterm birth complicates11% of all pregnancies and remains an important cause of perinatal mortality and long term neurological morbidity Intrauterine infection i.e. infection of decidua, amniotic fluid and fetal membrane plays a major role in the pathogenesis of preterm birth which itself is responsible for 70% of perinatal death and half of all long term neurological morbidity[2]. Preterm birth is responsible for 75% of neonatal deaths that are not due to congenital anomalies[3].

Care of the premature (birth weight 1-2.5kg) and immature (<1kg) infants is costly and compared with term infants they suffer greatly from functional disorder and abnormalities of growth and development[3]. The rate of preterm delivery has not decreased in the past several decades but the survival rate of infants delivered prematurely has increased. So, that many of the infants weighing 500-1000gm now survive in the developed countries. The percentage of survivors with handicaps has increased[4].

1. Assistant Professor, Department of Obstetrics and Gynaecology, Sir Salimullah Medical College, Dhaka
2. Medical Officer, Department of Virology, BSMMU, Dhaka

Address of Correspondence:Dr. Fahmida Haque, Assistant Professor, Department of Gynaecology and Obstetrics, Sir Salimullah Medical College, Dhaka

There is a strong link between clinically silent upper genital tract infection with preterm birth and adverse pregnancy outcome. The search for lower genital tract infection that will ultimately result in preterm birth is an important focus of current study. Genital tract infection represents a treatable cause of spontaneous preterm labour[5].

Bacterial vaginosis (BV) is a common disorder that may remain asymptomatic in half of the case and it may resolve spontaneously. BV does not follow Kochs postulate that a single pathogen is responsible for a specific disease but it is characterized by an overgrowth of a mixture of anaerobic bacteria and *Gardnerella vaginalis,* that replace the normal vaginal lactobacilli[2]. All these organisms are of relatively low virulence, but may produce serious adverse effect to both mother and fetus.

The role of bacterial vaginosis in the pathogenesis of preterm labour and delivery is not well understood. In one study relative risk of preterm delivery has been calculated to be >2fold in women with BV even after controlling for other major risk factors[2].

Bacterial vaginosis(BV) seems to cause preterm labour. The confirmation of a consistent association of BV to adverse pregnancy outcome but lack of more detailed knowledge about the strength of association between BV and premature birth in Bangladeshi women has motivated me to carry out this study.

Materials and methods

A case control study was conducted in the department of Obstetrics & Gynecology of Sir Salimullah Medical College and Mitford Hospital, Dhaka, during the period of January 2006 to September 2007 with a sample size of 100 (50 cases and 50 controlled). Pregnant women with singleton pregnancy in preterm labour at a gestational age between 28 to 36 weeks both primi and multi comprised the case. Pregnant women with singleton pregnancy at a gestational age between 28 to 36 weeks both primi and multi who were not in labour comprised the control group. Women who were treated with antibiotics before enrollment in the study, women with known uterine abnormalities, major fetal malformation, intrauterine growth retardation, fetal distress, fetal death, abruptio placenta, placenta previa, premature rupture of the membranes, multiple gestation, cervical encirclage, preeclampsia, insulin dependent DM, Rh –ve pregnancy were excluded. The women were selected by nonrandom or nonprobability or purposive sampling. After taking informed consent complete history was taken. Clinical examination was done. Vaginal samples were taken during speculum examination. Gestational age was determined from LMP and early ultrasonogram report where it was available. Data was collected through a preformed data collection sheet (questionnaire). The data was collected in a data collection sheet and organized in master data sheet. The data was presented in various tables and graphs and were analyzed by computer with statistical package for social sciences (SPSS version 12). Chi square test was done to determine p value. A two sided p value .05 was considered significant at 95% confidence level. Odds ratio and confidence limit was calculated to measure the risks. Multiple logistic regressions were done to measure the risks (Adjusted odds ratio).

Results

Table I

Sociodemographic characteristics of patients

Variables	Frequency Patient in preterm labour	Not in preterm labour
Age		
<30years	40	46
>30 years	02	04
Educational level		
Below SSC	44	45
Above SSC	06	05
Monthly family income		
<10,000	42	40
>10,000	08	10
Parity		
Primi para	24	18
Multi para	26	32
H/O smoking		
Absent	47	49
Present	03	01
H/O abortion		
Absent	45	42
Present	05	08
H/O preterm birth		
Absent	46	42
Present	04	08

Table II

Distribution of women by labour and bacterial vaginosis

Labour	Bacterial vaginosis		χ^2 value	P value
	Absent	Present		
In preterm labour	38(76)	12(24)		
Not in preterm labour	48(96)	2(4)	6.72	0.009
Total	86	14		

Table II shows distribution of women by labour and bacterial vaginosis. 12 (24%) women of in preterm labour group and 2 (4%) women of not in preterm labour group had bacterial vaginosis. Statistically significant difference was observed in term of absence and presence of bacterial vaginosis with status of labour (χ^2=6.72%, p<0.01). Women with bacterial vaginosis showed a higher risk of having preterm labour than those of women without bacterial vaginosis (Odds ratio =7.58 and 95% confidence limit was 1.59-35.93).

Table III shows that odds ratio at 95% confidence interval of the covariate were calculated to measure the risk for preterm labour in the study groups. Bacterial vaginosis was found as found as highest risk factor for preterm labour (odds ratio is 7.58). The second most common risk factor was smoking (odds ratio 3.1277).

Table III

Analysis of risk factors for preterm labour among the patients

Covariate	Odds ratio (95% confidence interval)
Bacterial vaginosis	7.58(1.59-35.93)
Smoking	3.1277(0.3141-31.1438)
Multiparity	0.6094(0.2736-1.3573)
History of preterm birth	0.4565(0.1281-1.6272)
Histroy of abortion	0.5833(0.1768-1.9248)

Table IV

Multivariate analysis of risk factors for preterm labour

Indicators	Model I Unadjusted OR (CI)	Model II Adj. OR(CI)	Model III Adj. OR(CI)	Model IV Adj.OR(CI)	Model V Adj.OR(CI)
Bacterial vaginosis					
-Absent	7.58	7.97	8.47*	8.39*	8.95*
-Present	(1.59 to 35.93)	1.73 to 37.95)	(1.84 to 41.98)	(1.86 to 42.1)	(1.91 to 46.80)
Smoking					
-Absent		3.32	3.53	4.47	4.12
-Present		(0.31-31.14)	(0.33-32.48)	(0.37-47.36)	(0.35-43.89)
Multiparity					
-Single			0.61	0.65	0.70
-Multipara			(0.27-1.35)	(0.30-1.46)	(0.32-1.51)
Past H/O preterm birth					
-Absent				0.46	0.51
-Present				(0.12-1.70)	(0.16-1.85)
Past H/O abortion					
-Absent					
-Present					0.60
					(0.18-1 1.95)

Table IV shows that multiple logistic regression techniques were used to derive maximum likelihood estimates of adjusted odds ratios (OR) and 95% confidence intervals (CI). Model I shows that women with bacterial vaginosis had 7.58 times more risk to have preterm labour than women without bacterial vaginosis. Model II shows that after adjusting for mothers smoking habit, women having bacterial vaginosis were again 7.97 times more likely to have preterm labour. After adjusting with all variables (smoking habit, multiparity, past H/O preterm birth and past H/O abortion) women having bacterial vaginosis were 8.95 times more likely to have preterm labour (model V). Women having bacterial vaginosis in all model showed significant risk to have preterm labour.

Discussion

The study was carried out to evaluate whether the presence of of bacterial vaginosis is associated with the onset of preterm labour. This case control study included 100 pregnant women, attended in the Obstetrics and Gynaecology Department of Mitford Hospital, Dhaka. 50 of which was in preterm labour (case) and 50 was not in preterm labour (control).

The age range of the study population was from 18-36 years. The mean (±SD) age of the patients in preterm labour group was 25.86(±0.50) of not in preterm labour group was 25.28(±0.57) years. Maximum women of not in preterm labour group and in preterm labour and in preterm labour group belonged to the age group 21-34 years(82% & 94% respectively). The age difference of both group was not statistically significant (p>0.05). The mean maternal age was 22.8 years in Tripathi et al. (2003)[6] series and 31 years at Oakeshott et al. (2004)[7] series.

Maximum women of both groups were educated up to primary level (52% and 40% respectively) Next highest literacy group for the women in preterm labour was illiterate (22%) and not in preterm labour group was secondary level(34%). There was no significant difference in term of educational status of both groups (>0.05). These results were not consistent with Begums' et al[8] series described educational status among women with preterm labour patients 13.6% illiterate, 27.27% educated up to primary level, 31.82% up to SSC level and 18.18% up to HSC and 9.09% graduate level.

Maximum (54% women of in preterm labour group belonged to low family income status but most (50%) of the not in preterm labour group belonged to middle income status. The differences in the groups in respect to income status was statistically significant (p<0.05). Our findings were nearly comparable with Begum's (2005)[8] findings. Most of the women of her series were from poor and average economic status family.Most of the women in preterm labour group (64%) & of not in preterm labour group ((52%) were multipara. The difference of the groups in parity was not statistically significant (p>0.05).

Three (6%) of preterm labour group and one (2%) of not in preterm labour group were smoker. The differences of both the group was not statistically significant (p>0.05). Maternal cigarette smoking has been associated with PTD and preterm rupture of membranes in some studies[9] but not in others[10]. In an epidemiologic study, a 2.1 fold increase of the risk of preterm birth was found among women who smoked cigarettes throughout pregnancy compared with nonsmokers[11]. However, cigarette smoking and coffee consumption were the only factors measured in relationship to occurrence of adverse pregnancy outcome[11]. Holst et al[12]. (1994) also stated cigarette smoking was significantly associated with preterm labour (PTL) but not in preterm delivery (PTD).

Four (8%) of in preterm labour group and eight (16%) women of not in preterm labour group had previous history of preterm birth. The differences in the groups were not statistically significant (p>0.05). A history of prior preterm birth was the single best historical predictor of both preterm labour (relative risk 3.6; 95% confidence interval, 1.92 to 6.83) and preterm birth (relative risk, 6.7; 95% confidence interval, 2.2 to 20.4)[10]. History of preterm birth has been associated with a two to six fold risk of recurrence of preterm delivery[13]. Also in Holst et al[12]. (1994) series a significantly higher frequency of previous PTDs was found among PTD women than among controls (p<0.01). None of the women with BV had a history of previous PTD, thus eliminating the single best historical predictor of PTD in these women.

Five (10%) of in preterm labour group and 8(16%) women of not in preterm labour group had a previous history of abortion. The differences in the

groups were not statistically significant (p>0.05). A history of three or more spontaneous and/or induced abortions has been correlated with an increased risk of PTL as described by McGregor et al[10]. (1990). In Holst et al[12]. (1994) series only a few PTL women, one with BV, had such a history.

In this series women with BV showed a risk of having preterm labour 7.58 times higher than those of women without bacterial vaginosis. 12(24%) women in preterm labour group and 2(4%) women of not in preterm labour group had bacterial vaginosis. Statistically significant difference was observed in term of absence and presence of bacterial vaginosis with status of labour ($Ç^2$=6.72, p<0.01). Women with BV showed a higher risk of having preterm labour than those of women without BV (Odds ratio=7.58 and 95% confidence limit was 1.59-3593).

Logistic regression was also used to study the association between BV and the preterm labour after adjusting with all other variables associated with preterm labour. Bacterial vaginosis remained associated with the preterm labour (odds ratio, 8.95; 95 percent confidence interval , 1.91 to 46.80) after adjustment for smoking, multiparity, any previous history of preterm birth, previous history of abortion. Increased risk of preterm labour of pregnant women having BV was observed in different studies. Kurki et al[14]. (1992) stated in their series, BV was associated with a 2.6fold risk (95% confidence interval [CI] 1.3 to 4.9) for preterm birth. Oakeshot et al[7]. (2004) stated that relative risk (RR) of preterm birth in women with BV was 0.9 (95% confidence interval [CI=0.4 to 2.2). In Gravett et al[15] (1986a) analysis yielding a relative risk of preterm labour for patients with bacterial vaginosis of 3.8. BV was significantly associated with preterm labour (OR, 2.0; CI1.1 to 3.5) as described by Gravett et al.[15] (1986b). McGregor et al[10] (1990) stated that the presence of bacterial vaginosis (18.7%) was associated with an increased risk of preterm labour (relative risk,2.6; 95% CI, 1.08 to 6.46). Tripathi et al[6] (2003) found among cases of BV, 59.6% (28/47) had adverse maternal and/or fetal outcome. A 7.5 fold increased risk of late miscarriage and 3.22 fold increased risk of preterm labor and/or delivery was observed. In a meta analysis Leitich et al[2] (2003) stated that BV increased the risk of preterm delivery > 2fold (Odds ratio, 2.19; 95% CI, 1.54-3.12). Increased risk of preterm labour in patient with BV is probaly due to choriodecidual bacterial colonization with similar organisms of lower genital tract or activation of a local inflammatory response by cytokines or endotoxins carried in theblood from the vagina to the uterus[4].

Limitation

The study was conducted in Sir Salimullah Medical College & Mitford hospital, Dhaka. It is a tertially level referral hospital and the sample size was small so this result may not reflect the picture of whole population.

Conclusion

There is a strong link between clincially silent upper genital tract infection with preterm labour. Lower genital tract infection that will ultimately result in preterm labour is an important focus of the current study because genital tract infection represent a potentially treatable cause of spontaneous preterm labour. Women with BV showed a higher risk of having preterm labour than those of women without having BV (odds ratio =7.58 and 95% CI, 1.59-35.93). Multiple logistic regression technique were used to derive maximum likelihood estrimates of adjusted odds ratio (OR) and 95% confidence interval (CI). After adjusting with all other variables women having BV were 8.95 times more likely to have preterm labour. However as the study has a small sample size which may not reflect the result of the whole population community based study and multicenter study should be conducted To reduce preterm labour it may be recommended that high risk women for pretem labour should be screened during their 1st rimester and again during mid second trimester for diagnosis and treatment of BV, thereby preventing preterm birth and its compilcation.

Recommendation

High risk pregnant women with preterm labour should be screened during their pregnancy for diagnosis of BV and should be treated, theireby preventing preterm birth and their complications.

References

1. Ramsey PS, Andrews WW Clin Perinatol. 2003 Dec;30(4):701-33,Biochemical predictors of preterm labor: fetal fibronectin and salivary estriol

2. Leitich H, Bodner-Adler B, Brunbauer M, Kaider A, Egarter C, Hussein P, Bacterial vaginosis as a risk factor for preterm delivery: a meta-analysis, Am J Obstet Gynecol. 2003 Jul;189(1):139-47.

3. Ashley S. Roman & Martin L. Pernoll 'Late pregnancy complications' in Current diagnosis & treatment obstetrics & gynecology edited by /DeCherney, Alan H. New York ; Sydney : McGraw-Hill Medical, c2007 pg 273-281

4. Goldenberg RL, Hauth JC, Andrews WW, Intrauterine infection and preterm delivery N Engl J Med. 2000 May 18;342(20):1500-7

5. Andrews WW, Sibai BM, Thom EA, Dudley D, Ernest JM, McNellis D, Leveno KJ, Wapner R, Moawad A, O'Sullivan MJ, Caritis SN, Iams JD, Langer O, Miodovnik M, Dombrowski M; Randomized clinical trial of metronidazole plus erythromycin to prevent spontaneous preterm delivery in fetal fibronectin-positive women. National Institute of Child Health & Human Development Maternal-Fetal Medicine Units Network, Obstet Gynecol. 2003 May; 101(5 Pt 1):847-55.

6. Tripathi R, Dimri S, Bhalla P, Ramji S, Bacterial vaginosis and pregnancy outcome, Int J Gynaecol Obstet. 2003 Nov;83(2):193-5.

7. Oakeshott P, Kerry S, Hay S, Hay P, Bacterial vaginosis and preterm birth: a prospective community-based cohort study, Br J Gen Pract. 2004 Feb;54(499):119-22.

8. Shah R, Mullany LC, Darmstadt GL, Mannan I, Rahman SM, Talukder RR, Applegate JA, Begum N, Mitra D, Arifeen SE, Baqui AH; ProjAHNMo Study Group in Bangladesh, Incidence and risk factors of preterm birth in a rural Bangladeshi cohort BMC Pediatr. 2014 Apr 24;14:112.

9. Berkowitz GS, An epidemiologic study of preterm delivery Am J Epidemiol. 1981 Jan;113(1):81-92.

10. McGregor JA, French JI, Richter R, Franco-Buff A, Johnson A, Hillier S, Judson FN, Todd JK, Antenatal microbiologic and maternal risk factors associated with prematurity Am J Obstet Gynecol. 1990 Nov;163(5 Pt 1):1465-73.

11. Williams MA, Mittendorf R, Stubblefield PG, Lieberman E, Schoenbaum SC, Monson RR; Cigarettes, coffee, and preterm premature rupture of the membranes Am J Epidemiol. 1992 Apr 15;135(8):895-903.

12. Holst E, Goffeng AR, Andersch B, Bacterial vaginosis and vaginal microorganisms in idiopathic premature labor and association with pregnancy outcome J Clin Microbiol. 1994 Jan;32(1):176-86.

13. Martius J, Krohn MA, Hillier SL, Stamm WE, Holmes KK, Eschenbach DA Relationships of vaginal Lactobacillus species, cervical Chlamydia trachomatis, and bacterial vaginosis to preterm birth, Obstet. Gynecol. 1988 Jan;71(1):89-95.

14. Kurki T, Sivonen A, Renkonen OV, Savia E, Ylikorkala O, Bacterial vaginosis in early pregnancy and pregnancy outcome, Obstet Gynecol. 1992 Aug;80(2):173-7.

15. Gravett MG, Hummel D, Eschenbach DA, Holmes KK, Preterm labor associated with subclinical amniotic fluid infection and with bacterial vaginosis, Obstet Gynecol. 1986 Feb;67(2):229-37.

A Comparative Study of Blood Culture and Widal Test in the Diagnosis of Enteric Fever in Febrile Patients

Farha Rahman[1], Sanya Tahmina[2], Tahmina Akther[3], Dipika Sarkar[4], Azizun Nahar[5], Israt Sadia[6], Shikha Paul[7]

Abstract

Background: *Enteric fever is a serious public health problem in developing countries including Bangladesh. As the disease is a major cause of morbidity and mortality definite diagnosis must be done for proper clinical management of the disease. The diagnosis of the disease is usually confirmed by blood culture and Widal test.*

Objective: *The purpose of this study was to assess and compare the role of blood culture and Widal test in the diagnosis of enteric fever in febrile patients.*

Methods: *A cross sectional study was done in the Department of Microbiology of Sir Salimullah Medical College, Dhaka among 325 clinically suspected enteric fever cases from July, 2014 to June, 2015. Blood samples were collected from each patient for blood culture and Widal test. Blood culture was done by conventional blood culture method and Widal test was done by rapid slide titration method.*

Results: *Among 325 cases, 63 (19.38%) cases were blood culture positive for* Salmonella *Typhi and Paratyphi A. Significant Widal titre observed in 31 (77.50%) and 03 (75.00%) cases among 44 culture positive cases of* Salmonella *Typhi and Paratyphi A.*

Conclusion: *In developing countries like Bangladesh both blood culture and Widal test must be done for proper diagnosis of enteric fever.*

Keywords: *Enteric fever, blood culture, Widal test.*

(Sir Salimullah Med Coll J 2016; 24: 30-34)

Introduction:

Enteric fever is a systemic infection caused by the Gram negative bacterium[1], *Salmonella enterica* serovar Typhi and Paratyphi are the common etiological agents [2]. It remains a significant health burden in developing countries like Bangladesh and India where substandard personal hygiene and poor sanitation is observed [3]. Current estimation shows that worldwide total number of typhoid fever episodes was 13.5 million in 2010 [4]. Bangladesh, India and Pakistan together account for about 85% of the world's typhoid cases [5]. Peak incidence is reported to occur in children within age range of 5-15 years [6]. In India and Bangladesh, the highest incidence has been observed among children aged <5 years[7, 8].

Since typhoid fever may mimic the symptoms of other fevers including dengue, malaria, hepatitis in typhoid endemic regions, results obtained from the laboratory are important in confirming the clinical diagnosis of typhoid and will contribute to the effective management and treatment of typhoid cases[9]. Diagnosis of typhoid fever mainly depends on the isolation of organisms by culture methods and antibody detection by serological methods [10]. Among the culture methods blood culture is the gold standard diagnostic method for diagnosis of

1. Lecturer of Microbiology, Bangladesh Medical College, Dhaka.
2. Director-disease control and line director-communicable disease control (CDC) Directorate General of Health Services, Bangladesh.
3. Medical Officer, Department of Virology, BSMMU, Dhaka
4. Clinical pathologist (Microbiology), Sir Salimullah Medical College, Dhaka.
5. Assistant Professor of Microbiology, Bangladesh Medical College, Dhaka.
6. Post-infection control doctor, Labaid hospital, Dhaka.
7. Associate Professor of Microbiology, Sir Salimullah Medical College, Dhaka.

Address of Correspondence: Dr. Farha Rahman, Lecturer, Department of Microbiology, Bangladesh Medical College, Dhaka. Cell phone: +8801715103524, E-mail: farhashoroni@gmail.com

enteric fever [3, 11]. Blood culture is positive in 60 to 80 percent patients with typhoid [3]. Sensitivity of blood culture is highest in the first week of illness and reduces with advancing diseases. Failure to isolate the organism may be caused by several factors which include inadequate laboratory media, volume of blood taken for culture, presence of antibiotics and the time of sample collection [11].

Widal test was the mainstay of typhoid fever diagnosis for decades [12]. It is widely available in developing countries and is still regarded as a useful test in endemic areas [13]. The test has only moderate sensitivity and specificity [14]. This test detects agglutinating antibodies against the 'O' and 'H' antigens of *Salmonella* Typhi and Paratyphi A, B [15]. It is simple and cheap to perform and with the slide format rather than tube it takes only a few minutes [16]. Therefore, the present study was carried out to assess and compare the role of blood culture and Widal test in the diagnosis of enteric fever in febrile patients.

Materials and Methods

This cross sectional study was carried out in the Department of Microbiology of Sir Salimullah Medical College, Dhaka from July, 2014 to June, 2015. A total of 325 clinically suspected enteric fever patients attending the out-patient Department of Medicine and Pediatric unit of Sir Salimullah Medical College and Mitford Hospital and also from Bangladesh Medical College and Hospital were included in this study.

Blood samples were collected aseptically from each patient and directly taken into a conventional blood culture bottle following standard procedure. Inoculated blood culture bottles were incubated at 37ÚC aerobically. Subculture was done aseptically from the blood culture bottles after 24 hours irrespective of haziness of blood culture media on blood agar, MacConkey agar and chocolate agar media. All the isolates were identified by observing colony morphology, staining characters and standard biochemical tests [17].

Widal test was done by rapid slide titration method. Widal reagents were procured from Linear Chemicals Limited, Spain. Antibodies were determined against 'O' (somatic) and 'H' (flagellar) antigens of *Salmonella* Typhi and Paratyphi A. From each patient for Widal test 2 ml of blood samples were collected into a sterile test tube and centrifuged for 5 minutes to separate the serum from the blood. Serial dilution of serum in normal saline was performed starting at a dilution of 1/20. One drop of the serum was pipette and dropped into a raw of circles on the card. Antigens 'O' and 'H' of *Salmonella* Typhi and Paratyphi A were shaken and one drop was added to each circle next to the sample to be tested. It was then mixed and rocked gently in a mechanical rotator (100 rpm) for one minute. Widal test was considered positive when a titre of equal to or more than 1:160 was observed.

Ethical consideration

The study protocol was approved by Ethical Review Committee of SSMC & MH.

Results

The rate of isolation of blood culture positive cases in relation to age and sex groups among the study population were shown in Table-I. Among 325 clinically suspected enteric fever cases, Majority of the cases 103 (31.69%) were in the age group of 1-5 years. Highest blood culture positive cases were also in the age group of 1-5 years 27 (26.21%), followed by 6-10 years of age group 15 (20.27%).

The clinical findings among the study population were shown in Table-II. Among 325 clinically suspected enteric fever cases, all the patients (100.00%) complained of fever, followed by headache 263 (80.92%), anorexia and vomiting 164 (50.46%), chills 123 (37.85%), abdominal discomfort 71 (21.85%), diarrhea 68 (20.92%), constipation 41 (12.61%), malaise 25 (07.69%) and bodyache 19 (05.85%).

The rate of isolation of organisms from blood culture among the study population were shown in Table-I. Among 325 clinically suspected enteric fever cases, 63 (19.38%) cases showed growth and the remaining 262 (80.62%) cases showed no growth.

The rate of isolation of organisms from blood culture positive cases were shown in Table-III. Among 63 blood culture positive cases, 54 (85.71%) cases were *Salmonella* Typhi and 09 (14.29%) cases were *Salmonella* Paratyphi A; no *Salmonella* Paratyphi B and other organisms were detected.

Comparison of Widal test with blood culture positive cases were shown in Table-IV. Among 63 blood culture positive cases, 44 cases came for 2nd Widal test but the rest 19 cases did not come for 2nd Widal test. Significant Widal titre observed in 31 (77.50%) and 03 (75.00%) cases among 40 cases of *Salmonella* Typhi and 04 cases of *Salmonella* Paratyphi A respectively.

Table-I

Rate of isolation of blood culture positive cases in relation to age and sex groups among the study population (n=325)

Age group (years)	Male n (%)	Female n (%)	Total n (%)	Blood culture positive cases n (%)
1-5	57 (17.54)	46 (14.15)	103 (31.69)	27 (26.21)
6-10	39 (12.00)	35 (10.77)	74 (22.77)	15 (20.27)
11-15	33 (10.15)	29 (08.92)	62 (19.08)	11 (17.74)
>15 & above	44 (13.54)	42 (12.92)	86 (26.46)	10 (11.63)
Total	173 (53.23)	152 (46.77)	325 (100.00)	63

Table-II

Clinical findings among the study population (n=325)

Clinical findings	Number of study population	Percentage
Fever	325	100.00
Headache	263	80.92
Anorexia, nausea, vomiting	164	50.46
Chills	123	37.85
Abdominal discomfort	71	21.85
Diarrhea	68	20.92
Constipation	41	12.61
Malaise	25	07.69
Bodyache	19	05.85

Table-III

Rate of isolation of organisms from blood culture positive cases (n=63)

Organisms	Number of isolates	Percentage
Salmonella Typhi	54	85.71
Salmonella Paratyphi A*Salmonella* Paratyphi B	0900	14.2900.00
Total	63	100.00

Table-IV

Comparison of Widal test with blood culture positive cases (n=44)

Name of organisms	Number of organisms	Significant Widal titre	Percentage of Widal test in relation to blood culture positive cases
Salmonella Typhi	40	31	77.50
Salmonella Paratyphi A	04	03	75.00

Discussion

Correct diagnosis of enteric fever is of paramount importance for instituting appropriate therapy and also for avoiding unnecessary therapy. Blood culture is the method of choice and has great advantage over culture from bone marrow, stool, urine and other body fluids [18]. Widal test is one of the most utilized diagnostic tests in the developing countries [19].

In the present study, majority of the cases were in the age group of 1-5 years which is 103 (31.69%). This finding correlated with the findings reported in studies done in Bangladesh by Sultana (2012) and Begum (2008) [20, 21]. Several studies also found that in typhoid endemic regions the highest infection rate is among children <5 years of age [7, 8]. In this study, blood culture positive cases were highest 27 (26.21%) in 1-5 years of age group followed by 15 (20.27%) cases in 6-10 years of age group. Similarly Sultana (2012) reported highest rate of blood culture positive cases which was 39.1% in 1-5 years of age group followed by 21.8% among 6-10 years of age group [20]. Another study in Bangladesh reported that majority (54.5%) of blood culture positive cases were from children younger than 5 years, the number of bacteria in per ml of blood by age group was inversely related to age [22].

In the current study, all the clinically suspected enteric fever cases presented with the complaints of fever 325 (100%), which was followed by headache 263 (80.92%), anorexia and vomiting 164 (50.46%). This observation correlated with a study done in Bangladesh where 100% cases presented with fever, 85% with headache and 46.3% with anorexia and vomiting [23].

In this study, out of 325 clinically suspected enteric fever cases, 63 (19.38%) *Salmonella* species were isolated from conventional blood culture method. This is almost similar with the results of Khan (2014) who found 20% *Salmonella* species [23]. This finding did not correlate with a study done in India where 8% *Salmonella* species were found [24]. The widespread availability and use of antibiotics in the community makes it frequently difficult to isolate the organisms from blood culture [25, 26].

In the present study, predominant isolates were *Salmonella* Typhi 54 (85.71%) followed by *Salmonella* Paratyphi A 09 (14.29%), which was similar to a study done by Gupta *et al*. (2013) [27]. Shadia *et al*. (2011) in Bangladesh found 79% isolates were *Salmonella* Typhi and 21% isolates were *Salmonella* Paratyphi A which did not correlate with the present study. Moreover, recent studies indicate that the proportion of *Salmonella* Paratyphi is increasing over the years in the subcontinent [2]. The reason may be due to the increase use of *Salmonella* Typhi vaccines in the general population which presumably lead to a decline in enteric fever cases due to *Salmonella* Typhi [28].

Classically in Widal test a fourfold rise of antibody in paired sera is considered diagnostic of enteric fever [15]. According to WHO guideline this test can be negative in up to 30% of culture proven cases of typhoid fever [14]. As previously mentioned that in current study 19 blood culture positive cases did not come for 2nd Widal test, so among the rest 44 blood culture positive cases, 40 were *Salmonella* Typhi and among them 31 cases showed significant Widal titre. This finding correlated with a study done in India by Sanjeev (2013) where in 33 blood culture positive cases, 26 cases showed significant Widal titre [29]. In India Udayakumar (2017) found similar study like us where out of 82 blood culture positive cases, 64 cases showed significant Widal titre [30]. Therefore, it is essential to perform blood culture technique along with Widal test as it is inexpensive and simple method for the diagnosis of enteric fever.

Conclusion

We know that blood culture is considered as a gold standard diagnostic method, but in developing countries like Bangladesh in most of the rural areas this culture facility is not usually available. In context of our country in majority of the cases it is really difficult for the poor patient to do blood culture as it is expensive, so they had to rely on the results of Widal test which is relatively cost effective, simple and the facilities are available almost everywhere. So for definite diagnosis of enteric fever both blood culture and Widal test should be done which can ultimately help in effective clinical management and will reduce the adverse effects and complications of enteric fever.

References

1. Rahman AKMM, Ahmad M, Begum RS, Ghosh AK and Hossain MZ. Multidrug resistant typhoid fever in children: a review. *J Dhaka Med Coll*. 2008; 17(2): 121-126.
2. Shadia K, Borhan SB, Hasin H, Rahman S, Sultana S, Barai L *et al*. Trends of antibiotic susceptibility of *Salmonella enterica* serovar Typhi and Paratyphi A in an urban hospital of Dhaka city over 6 years period. *Ibrahim Med Coll J*. 2011; 5(2): 42-45.
3. Parry CM, Hien TT, Dougan G, White NJ and Farrar JJ. Typhoid Fever. *N Engl J Med*. 2002; 347(22): 1770-1782.

4. Buckle GC, Walker CLF and Black RE. Typhoid fever and paratyphoid fever: systematic review to estimate global morbidity and mortality for 2010. *Journal of global health*. 2012; 2(1): 1-9.
5. Maurice J. A first step in bringing typhoid fever out of the closet. *The Lancet*. 2012; 379: 699-700.
6. Crump JA, Luby SP and Mintz ED. The global burden of typhoid fever. *Bulletin of the World Health Organization*. 2004; 82(5): 346-353.
7. Brooks WA, Hossain A, Goswami D, Sharmeen AT, Nahar K, Alam K *et al*. Bacteremic typhoid fever in children in an urban slum, Bangladesh. *Emerging Infectious Diseases*. 2005; 11(2): 326-329.
8. Sinha A, Sazawal S, Kumar R, Sood S, Reddaiah VP, Singh B *et al*. Typhoid fever in children aged less than 5 years. *The Lancet*. 1999; 354(9180): 734-737.
9. Ismail A. New advances in the diagnosis of typhoid and detection of typhoid carriers. *Malaysian Journal of Medical Sciences*. 2000; 7(2): 3-8.
10. Wain J, Bay PVB, Vinh H, Duong NM, Diep TS, Walsh AL *et al*. Quantitation of bacteria in bone marrow from patients with typhoid fever: relationship between counts and clinical features. *Journal of Clinical Microbiology*. 2001; 39(4): 1571-1576.
11. Das JC. Laboratory investigations of enteric fever in children: an update. *JCMCTA*. 2007; 18(2): 37-42.
12. Ezeigbo OR, Agomoh NG and Asuoha-Chuks N. Laboratory diagnosis of typhoid fever using Widal and blood culture methods in Aba, Southeastern Nigeria. *American Journal of Microbiological Research*. 2015; 3(6): 181-183.
13. Pang T and Puthucheary DS. Significance and value of the Widal test in the diagnosis of typhoid fever in an endemic area. *J Clin Pathol*. 1983; 36: 471-475.
14. World Health Organization. *Background document: The diagnosis, treatment and prevention of typhoid fever*, WHO, Geneva, Switzerland, 2003.
15. Olopoenia LA and King AL. Widal agglutination test-100 years later: still plagued by controversy. *Postgrad Med F*. 2000; 76: 80-84.
16. Parry CM, Wijedoru L, Arjyal A and Baker S. The utility of diagnostic tests for enteric fever in endemic locations. *Expert Rev Anti Infect Ther*. 2011; 9(6): 711-725.
17. Cheesbrough M. *District Laboratory Practice in Tropical Countries*, New York, USA: Cambridge University 2009; Part-2: 65, 67-70, 124-130, 132-143, 180, 182-186.
18. Parker MT. Enteric infection: typhoid & paratyphoid fever. In: Smith GR, Easman CSF(eds). *Topley's & Wilson's Principles of Bacteriology, Virology and Immunity*, 8th ed. London: Butler & Tanner Ltd. 1990.Vol-3, Chp-3.22: 424-442.
19. Tupasi TE, Aquino RL, Mendoza MT, Tuazon CU and Lolekha S. Clinical application of the Widal test. *Phil J Microbiol Infect Dis*. 1991; 20(1): 23-26.
20. Sultana S. Comparison of different test methods including polymerase chain reaction for early and reliable diagnosis of typhoid fever. Department of Microbiology: MMC. M.Phil, Thesis; 2012.
21. Begum Z. Comparison among the different diagnostic procedures for early and rapid diagnosis of typhoid fever. Department of Microbiology: MMC. M.Phil, Thesis; 2008.
22. Saha SK, Baqui AH, Hanif M, Darmstadt GL, Ruhulamin M, Nagatake T *et al*. Typhoid fever in Bangladesh: implications for vaccination policy. *Pediatric Infectious Disease Journal*. 2001; 20(5): 521-524.
23. Khan S. Detection of flagellin gene (*fliC-d*) of *Salmonella* Typhi by PCR in blood from clinically suspected typhoid fever patients. Department of Microbiology: BSMMU. M.Phil, Thesis; 2014.
24. Monica S, Devi K, Devi S and Banylla SN. Antibiogram of *Salmonella* Typhi isolated from enteric fever cases in a tertiary health care centre in Imphal. *International Journal of Pharmacology and Therapeutics*. 2014; 4(1): 15-18.
25. Bhutta ZA and Mansurali N. Rapid serologic diagnosis of pediatric typhoid fever in an endemic area: a prospective comparative evaluation of two dot-enzyme immunoassays and the Widal test. *Am J Trop Med Hyg*. 1999; 61(4): 654-657.
26. Gilman RH, Terminel M, Levine MM, Hernandez-Mendoza P and Hornick RB. Relative efficacy of blood, urine, rectal swab, bone-marrow and rose-spot cultures for recovery of *Salmonella* Typhi in typhoid fever. *The Lancet*. 1975: 1211-1213.
27. Gupta V, Singla N, Bansal N, Kaistha N and Chander J. Trends in the antibiotic resistance patterns of enteric fever isolates- a three year report from a tertiary care centre. *Malays J Med Sci*. 2013; 20(4): 71-75.
28. Mohanty S, Renuka K, Sood S, Das BK and Kapil A. Antibiogram pattern and seasonality of *Salmonella* serotypes in a North Indian tertiary care hospital. *Epidemiol Infect*. 2006; 134: 961-966.
29. Sanjeev H, Nayak S, Asha PKB, Rekha R, Karnaker V and Ganesh HR. A systematic evaluation of rapid DOT-EIA, blood culture and Widal test in the diagnosis of typhoid fever. *NUJHS*. 2013; 3(1): 21-24.
30. Udayakumar S, Pushpalatha K, Sagar HMN, Swathi PM, Yoganand R and Sushma C. Comparative study of Typhidot-M with Widal and blood culture in diagnosis of enteric fever. *Indian J Child Health*. 2017; 4(1): 64-67.

Case Report

Atypical Extension of Frontal Sinus – A Case Report

Md. Tariqul Islam[1], Bibekananda Halder[2], Mustaque Ahmed Bhuiyan[3], Aurobindo Roy[4], Mohammad Sazzad Hossain[5], Sunirmal Roy[6], Asifa Sattar[7]

Abstract:

An adult male patient with the complaints of headache and neck pain came to our Radiology and Imaging department for MRI of brain. On MRI we found abnormal oval signal at left subfrontal region. The patient had focal sinusitis at left frontal sinus. On MRI the oval subfrontal lesion was mimicking subfrontal meningioma or focal meningitis. Then we performed X-ray of paranasal sinuses OM view and CT scan of orbits and sinuses. CT reported atypical extension of left frontal sinus sandwiched between supraorbital region and frontal lobe of brain.

Key words: *atypical frontal sinus, CT scan*

(Sir Salimullah Med Coll J 2016; 24: 35-37)

Introduction

Pneumatization of the paranasal sinuses is related to several embryologic and developmental factors. This explains the great variability of the aeration and form of the sinus. The most notable of these is the frontal sinus, which is commonly not identical among individuals. The size of the frontal sinus has been accepted as a valuable measure for recognition of unidentified skulls.[1] Craniofacial configuration, thickness of the frontal bone, and growth hormones are major factors that have been reported to have an effect on the pneumatization.[2]

The frontal sinuses are two irregular cavities which extend backwards, upwards and laterally for a variable distance between the laminae of the frontal bone; they are separate from each other by a thin bony septum, which is often deflected to one or other side of the median plane, with the result that the sinuses are seldom symmetrical.

The frontal sinus is related superiorly to the anterior cranial fossa, olfactory niche, bulbs and tracts; inferiorly to the orbit, ethmoid labyrinth and nasal cavity and medially to the cribriform plate and olfactory niche.

The health and normal function of the paranasal sinuses and their lining mucous membrane depends primarily on two important factors: ventilation and drainage.

The frontal sinus ostium opens into an hourglass-shaped cleft, the frontal recess, which drains into the middle meatus of the nose.

Case report

An adult male patient of 57 years old came to our department of radiology and imaging to perform MRI of brain with the complaints of headache and neck pain. On MRI we found an oval lesion at left subfrontal region which was hyperintense on T2WI

1. Assistant Professor, Department of Radiology & Imaging, National Institute of Neuroscience & Hospital, Dhaka
2. Associate Professor, Department of Radiology & Imaging, Sir Salimullah Medical College, Dhaka
3. Assistant professor, Department of Radiology & Imaging, Sylhet MAG Osmani Medical College & Hospital
4. Radiologist, Dhaka Medical College Hospital, Dhaka.
5. Assistant professor, Department of Radiology and Imaging, Sir Salimullah Medical College , Dhaka
6. Associate Professor, Department of Neonatology, Sir Salimullah Medical College, Dhaka
7. Associate Professor, Department of Radiology & Imaging, Sir Salimullah Medical College, Dhaka

Address of Correspondence: Dr. Md. Tariqul Islam, Assistant Professor, Department of Radiology & Imaging, National Institute of Neuroscience & Hospital, Dhaka

and isointense to brain on T1WI. After I.V. contrast the lesion shows moderate enhancement. The oval subfrontal lesion was mimicking subfrontal meningioma or focal meningitis. In addition the patient had left frontal sinusitis. His routine biochemical reports were within normal limit. Then we performed an X-ray of paranasal sinuses OM view. The X-ray report was within the normal limit. After that we performed CT scan of the paranasal sinuses with bone window. On CT scan the left frontal sinus was found having an atypical extension. It extended over the left orbit at postero medial relation and also super added by inflammatory process. Then the case was diagnosed as atypical left frontal sinus with sinusitis. The patient went back to his clinician but reported to us again.

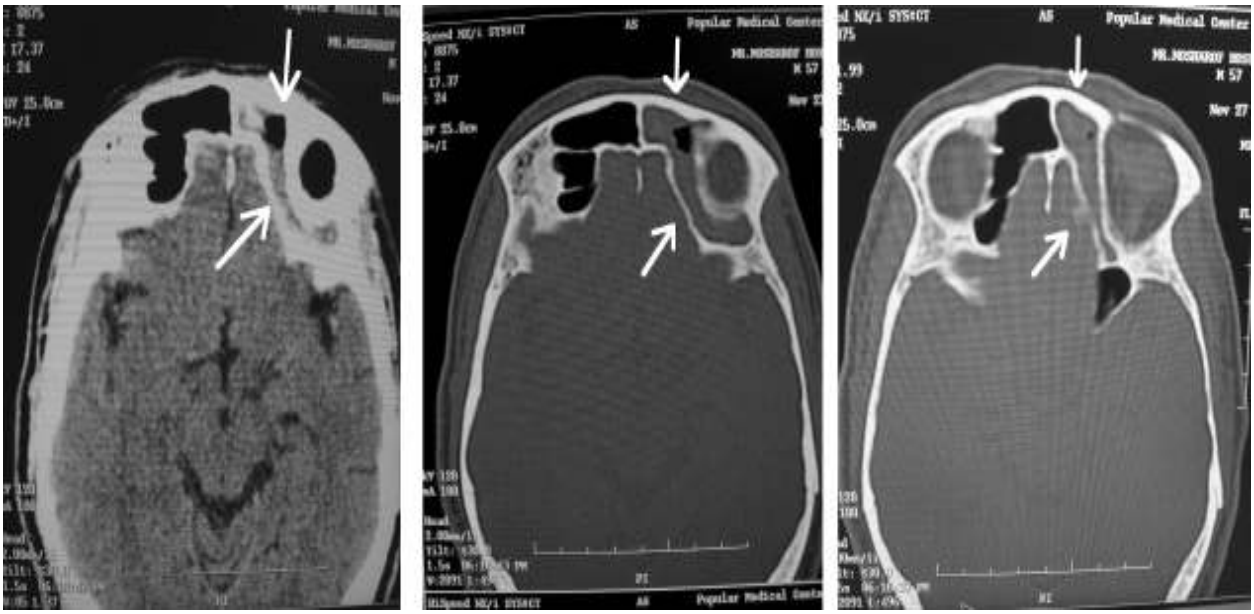

Fig.-1: *CT scans of left frontal sinus with bone windows*

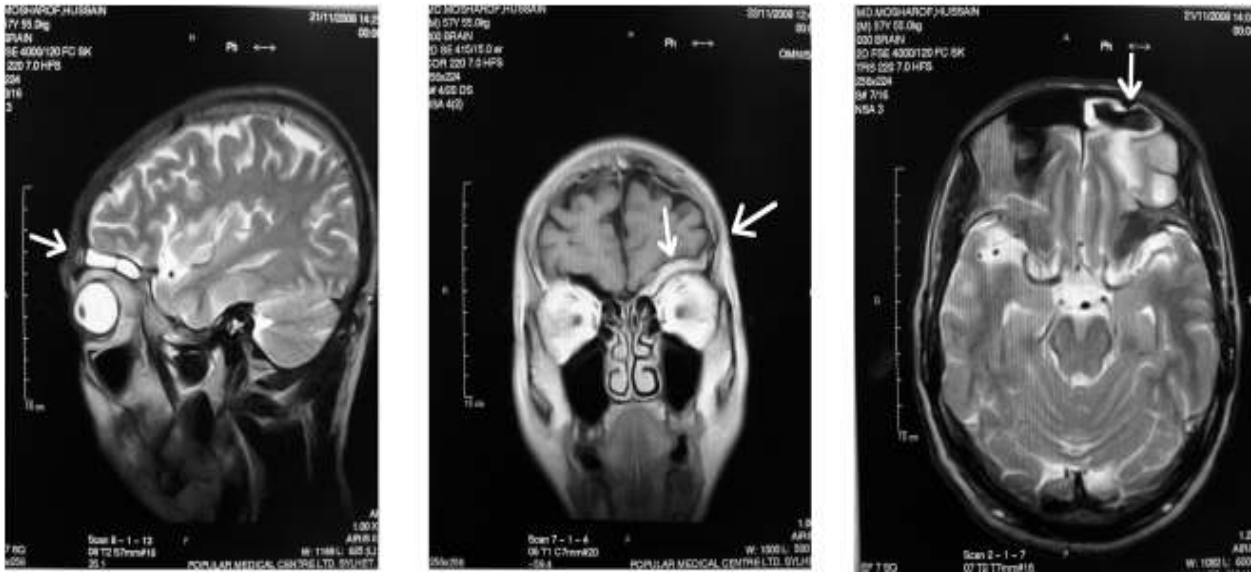

Fig.-2: *MRI showing the left frontal sinus*

Discussion:

Enlargement of the frontal and sphenoid sinuses begins at the age of 4 years and lasts until the age of 12 to15 years and follows the trends for growth in bone length .[03, 04] The difference in acceleration of growth rate of the sinus among individuals is also related to embryologic and environmental factors.

Comparative studies are lacking because abnormal aeration of the paranasal sinus occurs rarely. The incidence of abnormal frontal sinus aeration varies from 3.9% to 17.1% .[05] In a review of computed tomography (CT) scans of the paranasal sinuses of about 5600 patients of various ages, Spaeth et al. (1997) found no incidents of abnormal size. There are some possible explanations for this disproportional development. A congenital non-familial benign developmental lesion of the frontal bone probably is due to a localized arrest.

Knowledge of the complex anatomy of the fronto-ethmoidal region and sphenoid bone is very important in radiological identification of an abnormality or lesion .[06, 07] CT scanning is the primary diagnostic tool for evaluation of bone lesions but as the patient was referred by the clinician to get the MRI first, so we perform the CT scan later. Abnormalities of the paranasal sinuses may include agenesis, lack of complete aeration, and atypical or asymmetric aeration because of unilateral hypoplasia. Most bony anomalies do not produce clinical signs and symptoms unless they involve adjacent structures. In our case however, those anomalies may be confused with destructive lesions of the bone because of their unusual appearance and may present an esthetic problem. In or there was no complications of those anomalies include facial pain and headache or cranial nerve palsies following inflammation in one of the cavities, which may disseminate to the other sinuses through their connections. In our case the patient had only headache.

Conclusion

This case represents a very rare manifestation of abnormally extension of the frontal sinus that was complicated by sinusitis and was a diagnostic dilemma. Keen observation of imaging modalities needed to achieve accurate diagnosis.

References

1. Yoshino M, Miyasaka S, Sato H, Seta S. 1987. Classification system of frontal sinus patterns by radiography: Its application to identification of unknown skeletal remains. Forensic SciInt 34:289–299.
2. Shapiro R, Schorr S. A consideration of the systemic factors that influence frontal sinus pneumatization. *Invest Radiol.* 1980; 15:191–202.
3. BrownWA, Molleson TI, Chinn S. Enlargement of the frontal sinus. *Ann Hum Biol.* 1984;11:221–226
4. Weiglein A, Anderhuber W, Wolf G. Radiologic anatomy sinuses in the child. *SurgRadiol Anat.* 1992;14:335–339.
5. Spaeth J, Krugelstein U, Schlondorff G. The paranasal sinuses in CT-imaging: development from birth to age 25. *Int J PediatrOtorhinolaryngol.* 1997;39:25–40.
6. Dolan KD. Paranasal sinus radiology, Part 1B: the frontal sinuses. *Head Neck Surg.* 1982;4:385–400.
7. Dolan KD. Paranasal sinus radiology, Part 3A: sphenoidal sinus. *Head Neck Surg.* 1982;5:164–176.