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Clinicians should consider hypertension, diabetes Melitus and tobacco consumption to predict the risk of CAD during patient selection for angiogram for improvement of precision.

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Claudius Galenus, or Galen, was born in Pergamum, an old Greek city on the Aegean coast of Asia Minor, or present day Turkey, in the year 130 A.D . Galen was the greatest physician of ancient Rome. He developed Greek medicine on the foundation laid by Hippocrates .

Galen was a Greek who became the Roman Empire's great physician, authoring more books still in existence than any other Ancient Greek. And a huge amount of his works survived till date. Galen was a master of medical philosophy. He was a monotheist and believed that the body was the physical vehicle for the indwelling soul. Galen's monotheism greatly enhanced the acceptance of his medical theories and teachings by later generations of Muslim and Christian scholars and physicians.
He consolidated the work of previous Greek medical researchers, adding the results of his own research, to create an incredibly long-lasting medical doctrine.

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Contents

Journal Impact Factor: Is it a valid assessment index for scientific literature?

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Impact factor of published journals is an index based on the frequency with which a journal's articles are cited in scientific publications. Journal Impact Factor, although used as an index of evaluation of scientific publications since the 1960s, has a room for argument regarding its role as a quantitative marker of scientific quality of a journal.[1] It is also being used to evaluate individual scientists and institutions for the purposes of academic evaluation and funding allocation. And more often it is used by the librarians in selecting journals for library collections.[2] However it has been much debated in the literature in terms of their value for evaluating research quality.[3,4] Journal impact factor has its own limitations and adequate evaluation is warranted before it can be widely used as a quantitative marker of scientific quality of journal.

The Impact Factor had originally been designed to be an index of estimation of relevance of a scientific journal in respect to its publications and became popular in the scientific community.[5] However impact factor has been misunderstood and abused by many institutions attributing too much of significance on information that is not entirely scientific or reliable.[6]

By definition the impact factor of a journal is the number of all citations of all the articles in one journal in a given year divided by the original research and review articles published in that journal during the two previous years. It reflects the average number of citations to articles published in the journal. Besides Impact Factors, the Journal Citation Reports also include other bibliometric measures, such as 5-Year Impact Factor, Immediacy Index, Cited Half-life, aggregate Impact Factor and so on.[7]

The 5-year journal Impact factor is the number of all citations of all articles in one journal in a given year divided by the original research and review articles published in that journal during the five previous years. This index is useful in fields where it takes longer than two years to circulate and react to research results. Immediacy index is the number of citations which the articles in a journal receive in a given year divided by the number of articles published. It indicates how quickly articles in a journal are cited. Cited half-life is the median citation age of all the counted articles of a journal in a given year, starting from the time point where half of the citations were made and indicates how long-lasting the published research in a journal is[7].

The aggregate Impact Factor for a subject category is calculated by the number of citations to all journals in the category and the number of articles from all journals in the category.

So far the Impact factor is concerned, there are not adequate studies on impact factor's validity as an indicator of quality. Journals' impact factors are determined by technicalities unrelated to the scientific quality of their articles[3] There are a good number of limitations of Impact Factor as a valid index of scientific quality. A number of self-citation is reported at different levels, including author self-citation, journal self-citation, and subject category self-Citation leading to increase the impact factor. An editor of a journal may encourage authors to cite articles from that journal in the papers they submit.[7] Editorial policies of a journal may increase its impact factor instead of improving the scientific merit of the journal. Impact factors are calculated using citations not only from research articles but also review articles, editorials, letters, meeting abstracts, and case notes. Some of these publications provide the opportunity for manipulation of the ratio used to calculate impact factor. As the review articles are more frequently cited and inflate the impact factor of journals some editors may encourage the publication of increased number of review articles. Some publishers invite exclusively senior scientists to publish citable papers to increase the journal impact factor.

Impact Factor many a time, reflects the popularity of the particular topic of or citation and the availability of particular journal over wide area coverage. Journals with low circulation, in spite of their high scientific merit, are less likely to obtain high impact factors. The research fields also

influence high impact factors in journals covering large areas of basic research. As a scientific language, English-language journals generally have a higher Impact Factor than journals published in other languages.[6] Impact Factor has inadequate and uneven international coverage. Very few publications and journals from the less-developed countries are covered adequately.

The calculation of impact factor considers only average citation and as such a journal may have a few highly cited papers that greatly increase its impact factor in spite of the fact that the other papers in that same journal may not be cited at all. Therefore, there is no direct correlation between an individual article's citation frequency or quality and the journal impact factor. It is difficult for subspecialty journals to receive high Impact Factors. It is recommended that comparisons of Impact Factors and Impact Factor rankings should be performed under consideration of specialty areas.[3]

The impact factor is a useful tool for evaluation of journals, but it must be used discreetly. Despite the criticism, Impact Factor and citations get importance in recruitments, promotions, rewards and other recognitions. Eugene Garfield, who is the initiator of journal impact factor, stated very honestly after forty four years of inception of the idea "At that time it did not occur to me that it would one day become the subject of widespread controversy. Like nuclear energy, the impact factor has become a mixed blessing. I expected that it would be used constructively while I am recognizing that in the wrong hands it might be abused".[7] However we believe that impact factor is going to serve our purpose positively until some new and more effective tool is being formulated.

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Coronary artery disease and its predictors in a tertiary hospital, Bangladesh

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Abstract

Background: Coronary artery disease (CAD) poses a massive challenge globally. CAD is also a major health problem and the most common cause of premature morbidity and mortality in Bangladesh. In the global combat against CAD, Bangladesh is a country 'missing in action. **Objective:** To determine the status of coronary artery disease and its predictors of the patients performed successfully coronary angiogram (CAG) in the Cardiac Unit, Rajshahi Medical College Hospital, Bangladesh. **Methods:** This was a descriptive cross-sectional study conducted at Cardiac Unit of Rajshahi Medical College Hospital, Bangladesh. Total 400 patients, who successfully completed CAG in Cath Lab of Rajshahi Medical College, were selected in this study. Data were collected by pretested structured Patient Record (PR) Card by interview of the patients and from their respective coronary angiogram (CAG) reports in their treatment files. This PR card was designed to record patient's socio-demographic status, life style, history of systemic diseases and the angiographic findings. Chi-square test was applied to find out the association between the coronary artery disease, and the socio-demographic characteristics, life style and history of systemic disease of the patients. Multiple logistic regression was applied to identify the predictors of CAD. **Results:** Out of 400 study subjects, 275 (69%) patients had coronary artery disease. Of the total 275 patients who had CAD, more than 80% had single artery disease. Hypertension {odds ratio (OR): 8.11(95% CI 3.57 – 18.38)}, tobacco consumption {OR: 3.36 (95% CI 1.85 – 6.09)}, diabetes mellitus {OR: 3.10 (95% CI 1.61 – 5.97)} and higher monthly family income{OR: 2.82 (95% CI 1.55 – 5.11)} were identified as important predictors of CAD. **Conclusion:** Clinicians should consider hypertension, diabetes Melitus and tobacco consumption to predict the risk of CAD during patient selection for angiogram for improvement of precision. Existing health education program regarding screening and treatment of high blood pressure and diabetes mellitus, and avoidance to tobacco consumption should be promoted for the prevention and control of CAD at the individual and community level.

Key words: coronary artery diesase, predictors, Bangladesh.

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Introduction

Coronary artery disease (CAD) is the narrowing or blockage of the coronary arteries by more than 50% of the diameter usually caused by atherosclerosis. Atherosclerosis is a chronic condition that narrows arteries by building fat-filled bulges in the arterial walls.[1] As atherosclerosis progresses, fibers begin to grow into and around the fatty layers of atheroma, causing the blockage to harden and turn into a plaque (pronounced plak). The enlarging plaque (above) increases the encroachment into the inner channel of the coronary artery. When the channel is reduced by more than 50% (of the diameter) the artery may become obstructed enough to decrease blood flow to the heart muscle during times of increased need (exercise, emotional stress, etc.).[2]

Coronary artery disease (CAD) posseses a massive challenge globally.[3,4] It is the cause of 25-30% of deaths in developed countries. The WHO has drawn attention to the fact that CAD is our modern epidemic.[4]

Epidemics of CAD began at different times in different countries. In USA, epidemics began in the early 1920's, in Britain in the 1030s[6], in several European countries, still later. And now the developing countries are catching up. For example, in Singapore, the standardized death rate from CAD doubled in last 20 years. Similar trends have been noted in some other developing countries, specially South Asian countries e.g. Malaysia, Mauritius, India, Bangladesh and Sri Lanka.[7,8] Where the coronary artery disease rates four times higher than any other race. Since the 1950's, physicians and scientists have observed that South Asians have a significantly higher incidence of coronary artery disease.[5]

CAD is also a major health problem and the most common cause of premature morbidity and mortality in Bangladesh.[9] In a study by Mahmood et al (2008) in a private consultation practice at Daka, 14% of the referred patients were related to the heart and circulatory system.[10] Bangladesh has the highest rate of urbanisation and population density in South Asia, and is facing the worst threats of climate change globally. Factors associated with such extraordinary circumstances may have influenced the population's massive shift in epidemiology towards increased CVD. Equally, it could be linked to suboptimal nutrition, widespread environmental contaminants such as arsenic in ground water and plants, or

specific vulnerabilities in the genetic or metabolic make-up that have yet to be discovered. In the late 1990s it was estimated that there would be a 100% increase in CVD across South Asia by 2020. But, in Bangladesh, there has already been a 3,500% increase. In the global combat against CVD, Bangladesh is a country 'missing in action'.[11]

Of all South Asian countries, Bangladesh probably has the highest rates of CVD and yet is the least studied.[11] This study attempted to determine the status of coronary artery blockage of the admitted patients in the Cardiac Unit, underwent coronary angiogram (CAG) and its association with their socio-demographic characteristics, life style and systemic dideases, which are very much essential for preventive measures at the individual and community level.

Materials and Methods

This was a descriptive cross-sectional study conducted at Cardiac Unit of Rajshahi Medical College Hospital, Bangladesh. The patients, who underwent coronary angiogram (CAG) and successfully completed the CAG, in this unit constituted the study population. Total 400 patients were selected consecutively in the cardiac unit from the date of starting the data collection. The purpose and procedure were fully explained to the targeted patients before requesting to be volunteers, if they agreed and signed in written consent form were included in this study. Data were collected by pretested structured Patient Record (PR) Card by interview of the patients and from their respective CAG reports in their treatment files. This PR card was designed to record patient's socio-demographic status, life style, history of systemic diseases and the angiographic findings. Data were analysed in the computer using SPSS for windows. Descriptive analytical techniques involving frequency distribution, computation of percentage etc were done. Chi-square test was applied to find out the association between the coronary artery disease, and the socio-demographic characteristics, life style and history of systemic disease of the patients. Multiple logistic regression modeling was used to identify the important predictors (socio-demographic characteristics, life style and history of systemic disease of the patients) of CAD among the study subjects.

Results:

Out of 400 patients who successfully completed coronary angiogram (CAG) in Cath Lab of Rajshahi Medical College, 275 (69%) patients had coronary artery disease (coronary artery blockage > 50%) and the rest 125 (31%) patients had no CAD. Of the 400 patients, highest number of the patients, 154 (38.5%) had coronary artery blockage 71 – 95% and lowest number of the patients, 40 (10.0%) had coronary blockage 96 – 100% (Figure 1). Of the total 275 patients who had coronary artery disease, more than 80% had single artery disease. Left anterior descending (LAD) artery was blocked alone in case of 45.8 % (Table 1).

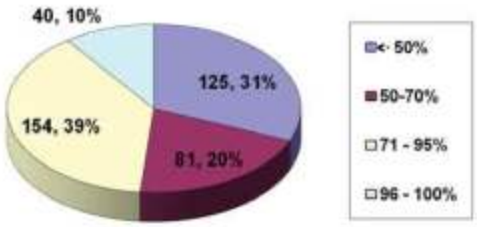

Figure 1 Distribution of the patients by the proportion of blockage of the coronary arteries

Of the total 400 patients, 285 (71.3%) patients complained of only chest pain and 53 (13.2%) patients complained of only respiratory distress during admission. Only 22 (5.5%) patients complained both chest pain and respiratory distress. Rest of the patients complained either chest pain or respiratory distress with palpitation or nausea (Table 2).

Table 1 Coronary artery disease and involvement of coronary arteries

Status of coronary artery disease	Coronary artery involved	Frequency(N (%)	
Single coronary artery disease	Left Anterior Descending (LAD) Artery	126 (45.8)	229 (83.3)
	Right Coronary (RC) Artery	53 (19.3)	
	Circumflex (Circ) Artery	50(18.2)	
Double coronary artery disease	LAD and RC Artery	14 (5.1)	28 (10.2)
	LAD and Circ Artery	10 (3.6)	
	RC and Circ Artery	4 (1.5)	
Triple coronary artery disease	LAD, RC and Circ Artery	18 (6.5)	18 (6.5)
	Total	275 (100.0)	275 (100.0)

Table 2 Chief complaints of the patients during admission

Chief complaints	Frequency (N)	Percentage (%)
Chest pain	285	71.3
Respiratory distress	53	13.2
Chest pain with respiratory distress	22	5.5
Chest pain with palpitation	19	4.8
Respiratory distress with palpitation	17	4.2
Chest pain with nausea	02	0.5
Respiratory distress with nausea	02	0.5
Total	400	100.0

Age, gender, monthly family income, smoking habit, and history of hypertension and diabetes mellitus of the patients were identified as significant correlates of CAD (Table 3). History of hypertension was identified as the most important predictor of CAD. Hypertensive patients had a 8.11(95% CI 3.57 – 18.38) times greater chance to have CAD than the patients without hypertension. Other important predictors of CAD identified in this study were tobacco consumption {odds ratio (OR): 3.36 (95% CI 1.85 – 6.09)}, history of diabetes mellitus {OR: 3.10 (95% CI 1.61 – 5.97)} and higher monthly family income{OR: 2.82 (95% CI 1.55 – 5.11)} (Table 4).

Table 3 Factors associated with coronary artery disease. n = 400

Factors	Coronary artery disease status		p-value
	Stenosis ≥ 50% N (%)	Stenosis < 50% N (%)	
Age of the patients			
< 50 years (n=249)	158 (63.5)	91(36.5)	0.003
50 years or above (n=151)	117 (77.5)	34 (22.5)	
Gender			
Male (n=335)	238(71.0)	97 (29.0)	0.025
Female (n=65)	37 (56.9)	28 (43.1)	
Religion			
Islam (n=352)	243 (69.0)	109 (31.0)	0.161
Hindus (n=42)	30 (71.4)	12 (28.6)	
Christian (n= 6)	2 (33.3)	4 (66.7)	
Educational Status			
< SSC (n=329)	163 (71.2)	66 (28.8)	0.235
SSC or above (n=171)	112 (65.5)	59 (34.5)	
Monthly family income			
Up to Tk. 10000/- (n=94)	50 (53.2)	44 (46.8)	0.001
Tk. 10001/- to 20000/- (n=171)	126 (73.7)	45 (26.3)	
Above Tk. 20000/- (n=135)	99 (73.3)	36 (26.7)	
Smoking			
Non smoker (n=147)	81 (55.1)	66 (44.9)	0.000
Ex-smoker (n=118)	85 (72.0)	33 (28.0)	
Smoker (n=135)	109 (80.7)	26 (19.3)	
History of hypertension			
Present (n=93)	85 (91.4)	8 9 (8.6)	0.000
Absent (n=307)	190 (61.9)	117 (38.1)	
History of diabetes mellitus			
Present (n=80)	48 (78.8)	29 (21.2)	0 .032
Absent (n=320)	227 (66.2)	96 (33.8)	

Chi-square test applied

Table 4 Multiple logistic regression analysis: Predictors of coronary artery disease. n = 400

Variables	Adjusted odds ratio [95% confidence interval (CI)]	p-value
Age		0.037
< 50 years (n=249)*	1.00	
50 years or above (n=151)	1.72 (1.03 - 2.89	
Gender		0.05
Male (n=335)	1.88 (1.00 – 3.54)	
Female (n=65)*	1.00	
Monthly family income		0.001
Up to Tk. 10000/- (n=94)*	1.00	
Tk. 10001/- to 20000/- (n=171)	2.82 (1.55 – 5.11)	0.001
Above Tk. 20000/- (n=135)	2.71 (1.45 – 5.08)	0.002
Habit of Smoking		0.000
Non smoker (n=147)*	1.00	
Ex-smoker (n=118)	1.85 (1.04 – 3.30)	0.036
Smoker (n=135)	3.36 (1.85 – 6.09)	0.000
History of hypertension		0.000
Present (n=93)	8.11 (3.57 – 18.38)	
Absent (n=307)*	1.00	
History of diabetes mellitus		0.001
Present (n=80)	3.10 (1.61 – 5.97)	
Absent (n=320)*	1.00	

*Reference group

Discussion

Sixty nine percent of the patients who successfully completed CAG in Cath Lab of Rajshahi Medical College, having coronary artery blockage. It reflects the satisfactory precision of existing referral system in Cardiac Unit of Rajshahi Medical College for angiogram, but there is a space of improvement.

In a study of Brscic et al.(2000)[12] in America, 57% of CAD patients had single artery blockage. In Bangladesh, Patwary et al. (2008) [9] found 72.73% of acute myocardial infarction patients in National Institute of Cardiovascular Diseases (NICVD), Dhaka had single artery blockage. In the present study it was also more than 80%. Previous studies[9,12] suggests that in CAD, most frequently involve artery is LAD. It is consistent with the finding of present study.

Angina is the most common clinical presentation of CAD, which is often referred to as chest pain due to stimulation of nerve endings near the endocardium by factors such as adenosine, lactate, and H^+.[13] In the present study also more than 82.0% of the patients complained of chest pain during admission. For some patients, dyspnoea is the only sensation experienced during CAD.[13] Same observation also found in this study.

The chance of developing CAD increases with age. In USA Coronary artery disease is a common disease of the elderly people.[1,4] This study also suggested that blocking of the coronary artery remarkably higher among the elderly people.

Studies[1,7] suggested that males suffer more CAD than females, due to protective effect of female sex hormone before menopause. In this present study there was also a significant gender difference in developing CAD.

When CAD emerged as the modern epidemic, it was the disease of the higher social classes in the most affluent societies. Fifty years later the situation is changing; there is a strong inverse relation between social class and CAD in developed countries.[3,4] Now CAD is the commonest cause of death and affects poorer people more in these countries. This time-trend has not been explained satisfactorily.[3] But it may be due to epidemiological transition of CAD. The findings of the study suggests still it is the disease of the higher social classes in Bangladesh and Bangladesh is in still at the early stage of the epidemiological transition of the disease.

Cigarette smoking or any form of tobacco consumption is one of the most powerful predictors for the development of CAD in all age groups.[1] Some people commit suicide by hanging, but many by tobacco consumption. A uniquely human habit,

smoking has been identified as a major CAD risk factor with several possible mechanism-carbon monoxide induced atherogenesis; nicotine stimulation of adrenergic drive raising both blood pressure and myocardial oxygen demand; lipid metabolism with fall in "protective" high-density lipoprotein.[7,4] In patients who already have coronary artery disease, tobacco consumption is associated with a higher likelihood of myocardial infarction and of sudden cardiac death.[1] The present study also suggests that blockage of coronary artery is associated with tobacco consumption.

The blood pressure is the single most useful test for identifying individuals at a high risk of developing CAD. Hypertension accelerates the atherosclerotic process, especially if hyperlipidemia is also present and contributes importantly to CAD.[4,7] For example, middle-aged men with blood pressures >169/95 are 5 times more likely to have atherosclerotic heart disease than middle-aged men without high blood pressures (<140/90)[1]. In this present study, the proportion of coronary artery blockage among the hypertensive patients was also significantly higher than that of non hypertensive patients and most important predictor of CAD.

Diabetes puts a patient at high risk of developing CAD. Diabetes tends to increase the level of blood cholesterol and to worsen atherosclerosis. Eighty percent of the people with type 2 diabetes die from some form of cardiovascular disease, and people with diabetes are more likely to have myocardial infarctions or strokes than people without diabetes.[1] The risk of CAD is 2 -3 times higher in diabetics than in non diabetics.[7] CAD is responsible for 30 to 50 percent of deaths in diabetics over the age of 40 years in industrialized countries.[14] This study also suggests that diabetes mellitus is associated with the coronary artery blockage.

Our study possesses a number of methodological limitations that must be taken into consideration. First, it was not a community based study, participants represented the patients attending at the tertiary level hospital. Second, some important predictors of CAD, like lipid profile, family history of CAD and dietary habit were not consider in this study.

Clinicians should consider the hypertension, diabetes and smoking habit of patients to predict the risk of CAD for improvement the precision of selection for angiogram during their clinical practice. Existing health education program regarding screening and treatment of high blood pressure and diabetes mellitus, and avoidance to tobacco consumption should be promoted for the prevention and control of CAD at the individual and community level.

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A Comparison of Anti-Cyclic Citrullinated Peptide Antibodies and Rheumatoid Factor in Diagnosis of Rheumatoid Arthritis

Md. Golam Rabbani[a], Md. Anayet Ullah[b], M. Manzurul Haque[c]

Abstract

Background: Conventionally, the serology test routinely used in rheumatoid arthritis (RA) is the determination of serum Rheumatoid Factor (RF), but Recently anti-cyclic citrullinated peptide antibodies (anti-CCP antibodies) are also recognized as auto antibodies for the diagnosis of RA. **Objective:** To determine and compare the diagnostic performance of anti-CCP and RF to diagnose rheumatoid arthritis in Bangladesh. **Methods:** This was a cross-sectional descriptive type of study conducted in the department of Medicine, Rajshahi Medical College Hospital, Rajshahi, Bangladesh. Total 100 serum samples: 40 from definite RA patients according to the American Rheumatism Association (ARA) criteria, 30 from non RA patients and 30 samples from apparently healthy control individuals, were included in this study. IgG anti-CCP antibodies and IgM RF were determined by first-generation ELISA method and Latex agglutination method respectively. The diagnostic performance of anti-CCP and RF were determined by calculating the four indices of test validity: sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV). **Results:** Among the three study groups, anti CCP antibody was positive in 19 (47.5%) patients of RA group, none in non-RA group and only one patient in healthy group. IgM-RF was positive in case of 21 (52.50%) patients of RA group, and 3 (10%) patients of NRA group and none of control group. Sensitivity and specificity of anti CCP antibody to differentiate rheumatoid arthritis patients from non-rheumatoid arthritis patients were 47.5% and 100.0% respectively. Sensitivity and specificity were 52.5% and 90.0% in case of RF. **Conclusion:** The diagnostic performance of both anti-CCP and RF were not satisfactory, particularly considering sensitivity. However, anti-CCP is the better choice than RF in RA diagnosis due to the high specificity. The combination of anti-CCP and IgM-RF may yields better results in RA diagnosis than either test alone among the study population.

Key words: rheumatoid arthritis, diagnostic performance, anti-CCP antibodies, rheumatoid factor.

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Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease with a progressive course that may lead to joint destruction, seen throughout the world and affects all races.[1] If not effectively treated, 20%–30% of RA patients become so severely debilitated within the first three years following initial diagnosis that they become permanently disabled.[2] Approximately 1.3 million adults in the United States have been diagnosed with RA.[3] Numerous studies around the world report prevalence just under 1.0%. In Bangladesh it is about 0.7%.[4]

Conventionally, the serology test routinely used in RA is the determination of serum Rheumatoid Factor (RF) which has acceptable sensitivity, but modest specificity, particularly in the early course of the disease.[5] Recently anti-cyclic citrullinated peptide antibodies (anti-CCP antibodies) are recognized as auto antibodies for the diagnosis of RA. Anti-CCP testing is particularly useful in the diagnosis of RA and it is able to predict the severity of the disease and the irreversible damage.[6] Anti-CCPs have recently been added as one of the criteria in the 2010 American College of Rheumatology (ACR) /European League Against Rheumatism (EULAR) classification of RA.[7] Some studies have shown that anti- CCP antibodies are moderately sensitive but highly specific for the diagnosis of RA, and their specificity is higher than RF.[8]

Anti-CCP antibodies are produced locally at sites of inflammation, not only in the synovium of RA, but also in other non-RA diseases.[9] Therefore, anti-CCP positivity may be expected in a proportion of patients with non-RA diseases as well. Hence, discrepancy in sensitivity and specificity of anti-CCP between various studies may be attributed to differences in false-positive rates among selected controls. However, other factors such as detection techniques, ethnic differences and genetic background may be also responsible for these variations. For this reason, the present study was designed to determine and compare the diagnostic performance of anti-CCP and RF among the patients in the department of Medicine, Rajshahi Medical College Hospital in Bangladesh.

Materials and Methods

This descriptive cross sectional study conducted in the department of Medicine, Rajshahi Medical College Hospital, Rajshahi, Bangladesh. Total 100 serum samples: 40 from definite RA patients according to the American Rheumatism Association (ARA) criteria,[7] thirty from non RA patients comprised of arthritic patients but not fulfilling ARA criteria (other rheumatic patients) and thirty samples from apparently healthy control individuals, were included in this study. The diagnosis was made by the doctors in Rajshahi Medical College teaching hospital from January-2007 to December 2008.

IgG anti-CCP antibodies were determined in Department of Microbiology, RMC, Rajshahi and BSMMU, Dhaka by first-generation ELISA method, purchased from Euro-Diagnostica, Netherlands. The anti-CCP was considered positive at values greater than18 U/ml. IgM RF was determined in Department of Microbiology, RMC, Rajshahi by Latex agglutination method, purchased from Biotest International Inc, United Kingdom. The RF was considered positive at values greater than 10 U/ml. Each of these tests was performed and evaluated by operators who were blinded to other serological results and unaware of the patients' clinical data.

The statistical analysis was performed using SPSS, version 16. The diagnostic performance of anti-CCP and RF were determined by calculating the four indices of test validity: sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV). This study was not designed to investigate the relationship between clinical symptoms and laboratory results.

Results

Among the three study groups, anti CCP antibody was positive in 19 (47.5%) patients of RA group, none in non-RA group and only one patient in healthy group. IgM-RF was positive in case of 21 (52.50%) patients of RA group, and 3 (10%) patients of NRA group and none of control group (Table 1).

Table 1: Distribution of anti- CCP and rheumatoid factor (RF) test results in studied patients according to RA diagnosis

Test	Study group		
	Rheumatoid Arthritis n=40 N (%)	Non- Rheumatoid Arthritis N =30 N (%)	Healthy N=30 N (%)
Anti-CCP			
Positive	19 (47.5)	00 (00.0)	01 (03.3)
Negative	21 (52.5)	30 (100.0)	29 (96.7)
Rheumatoid factor			
Positive	21 (52.5)	03 (10.0)	00 (00.0)
Negative	19 (47.5)	27 (90.0)	30 (100.0)

To diagnose the rheumatoid arthritis patients in comparison with healthy individuals, sensitivity and specificity of anti CCP antibody were 47.5% and 96.6% respectively. The diagnostic power of the positive test (predictive value of the positive test) was 95.00% and the predictive value of the negative test was 58.0%. In case of RF, the sensitivity, specificity, positive predictive value and negative predictive value were 52.5%, 100.0%, 100.0% and 61.2% respectively (Table 2).

Sensitivity and specificity of anti CCP antibody to differentiate rheumatoid arthritis patients from non-rheumatoid arthritis patients were 47.5% and 100.0% respectively. The positive and negative predictive values were 100.0% and 58.8%. Sensitivity and specificity were 52.5% and 90.0% in case of RF. The positive and negative predictive values of RF were 87.5% and 58.6% respectively (Table 3).

Discussion

Recently, a highly specific autoantibody system has been described for RA, in which patients develop antibodies to citrullinated, and this has resulted in the development of the anticyclic citrullinated peptide (anti-CCP) antibody test.[10] Anti-CCPs have recently been added as one of the criteria in the 2010 American College of Rheumatology (ACR) /European League Against Rheumatism (EULAR) classification of RA.[7] Studies have shown that anti-CCP antibodies are moderately sensitive (42% - 68%) but highly specific (90 - 99%) for the diagnosis of RA.[11-13] Our experience with the anti-CCP assay in 40 patients with RA indicates a sensitivity and specificity for RA of 47.5% and 96.6% in comparison with normal subjects and 47.5% and 100.0% in comparison with non-rheumatic patients. This moderate sensitivity and high specificity in our hands consistent with the initial experience of others.[11-13] In addition, we observed a low frequency of anti-CCP in non- rheumatic diseases. Of particular interest was the fact that none of the patients with non-rheumatoid arthritis and only 1/30 healthy individuals were positive.

The presence of "rheumatoid factor" (RF) was identified in patients with RA over 50 years ago[14]; assays for RF remain one of the American College of Rheumatology (ACR) classification criteria for RA. In this study the sensitivity and specificity of RF were 52.5% and 90 %, respectively. These values are similar to those reported by Aflaky et al.[15] & Binesh et al.[11]using latex fixation test.

RF has higher sensitivity but lower specificity than anti-CCP. It may be due to positive in patients with other autoimmune and infectious diseases, and even in a noticeable proportion of normal healthy subjects, particularly in old individuals.[16] In this present study RF also positive in 3/30 non- reumatic arthritis.

Table 2 Comparison of indices of test validity of anti CCP antibody and rheumatoid factor (RF) to differentiate rheumatoid arthritis patients from healthy individuals.

Tests	Sensitivity (%)(CI 95%)	Specificity (%) (CI 95%)	Positive predictive value (PPV) (%)(CI 95%)	Negative predictive value (NPV) (%)(CI 95%)
Anti CCP antibody	47.5 (31.5-63.8)	96.6 (82.7-99.9)	95.0 (75.1-99.8)	58.0 (43.2-71.8)
Rheumatoid factor	52.5 (36.1-68.4)	100.0 (88.4-100.0)	100.0 (83.8-100.0)	61.2 (46.2-74.8)

Table 3 Comparison of indices of test validity of anti CCP antibody and rheumatoid factor (RF) to differentiate the rheumatoid from non-rheumatoid arthritis patients.

Tests	Sensitivity (%) (CI 95%)	Specificity (%) (CI 95%)	Positive predictive value (PPV) (%)(CI 95%)	Negative predictive value (NPV) (%)(CI 95%)
Anti CCP antibody	47.5 (31.5 to 63.8)	100.0 (88.4 to 100.0)	100.0 (82.3 to 100.0)	58.8(44.1 to 72.4)
Rheumatoid factor	52.5 (36.1 to 68.5)	90.0 (73.4 to 97.9)	87.5 (67.6 to 97.3)	58.6 (43.2 to 73.0)

There is no question about the specificity of both the tests, anti-CCP and RF to detect RA, it is reliable. But there is a wide range of sensitivity of both anti-CCP (42-100%)[13] and RF (26-90%) in RA.[17] There are a number of explanations for this wide range of sensitivity reported in different studies. One potential explanation for the discrepancy is that the differences in the patient populations (like disease duration, genetic, lifestyle and geography) among these studies might have influenced the test results.[11,18-20] Another explanation for the discrepancy is that the different studies using different cutoff values, methodologies and manufacturers for anti-CCP and RF.[13]

The sensitivity of the both anti-CCP and RF in this study were at the bottom of the ranges mentioned above. The possible reasons for the low sensitivities of both the biomarkers reported in this study could be the characteristics of the study subjects specially disease duration. Because more than 27.0% of RA patients in this study were suffering from RA less than 6 months and 40.0% less than 1 year. Another possible reason for the low sensitivities could be the test methods (first-generation ELISA method for anti-CCP) used in this study. Because the first-generation anti- CCP have a low analytical sensitivity.[21] It is needed to further investigation. Additionally the influences of genetic, geography and lifestyle on serum biomarkers anti-CCP and RF test results is needed to investigate among the study population in future.

The results of this study have certain implication in clinical practice for the diagnosis of RA. Neither anti-CCP nor RF certainly brings us to our expectation, particularly considering sensitivity. However, anti-CCP is the better choice than RF in RA diagnosis due to the high specificity. Two tests can be used in combination to enhance the specificity or sensitivity. The combination of anti-CCP and IgM-RF yields higher sensitivity for diagnosis of RA than either test alone.[11] So in clinical practice this strategy can be applied to get the best results in RA diagnosis among the study population.

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Hepatoprotective activity of Ethanolic extract of leaf and seed of *Tamarindus Indica* against Paracetamol induced Hepatotoxicity in Rats.

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ABSTRACT:

Background: In Bangladesh about 35million people are suffering from liver disease. Herbs play a vital role in the management of various liver disease in absence of reliable hepatoprotective drugs in Allopathic medical practice. **Objective:** to observe the hepatoprotective effect of ethanolic extract of *Tamarindus Indica* leaves & seeds. **Methods:** A total of 24 male Long Evan's rats (150-180gm) were used for this study. They were divided into 4 groups designated as control received normal diet *ad libitum only*, Only paracetamol group received paracetamol (1500 mg/kg) for 12 days and rest two groups ethanolic extract of leaf and seed received paracetamol (1500mg/kg) along with ethanolic extract of leaf (1250 mg/kg) and seed (1250 mg/kg) of *Tamarindus indica* for 12 days respectively. After 24 hours of last treatment, all rats were sacrificed for the estimation of liver function parameters (ALT, AST, ALP and bilirubin) and histopathological study of their liver tissue.Ethical clearance for the use of animals was obtained from the committee constituted for the purpose. **Results:** Only Paracetamol group showed a significant increase in alanine aminotransferase (ALT), aspartate aminotransferase (AST), total bilirubin and alkaline phosphatase (ALP) along with gross hepatocellular damage. On the other hand ethanolic leaves(1250mg/kg) and seeds (1250mg/kg) extract of *Tamarindus Indica* treated groups showed a significant decrease of the above parameters and histopathological examination of liver tissue revealed an almost return to normal architecture. The values were expressed as mean ± SD. The statistical analysis was carried out by unpaired student's "t" test and $P<0.05$ was considered as significant. **Conclusion:** *Tamarindus Indica* a very commonly used food can be applied for treatment of drugs or chemical induced hepatotoxicity.

INTRODUCTION

Liver is the major site of intense metabolic activities. Because of its strategic anatomical location, it is exposed to many kinds of xenobiotics and therapeutic agents. Certain medicinal agents like Paracetamol, Aspirin, Halothane, Diclofenac etc. when taken in overdoses or within therapeutic ranges may be the cause of liver injury.[1] Despite of excellent regeneration capacity of this organ, a slight injury or toxicity may lead to fatal complications.[2] Therefore, damage to the liver inflicted by hepatotoxic agents is of grave consequences. In Bangladesh about 35million people are suffering from liver disease[3] Unfotunately, conventional or synthetic drugs used in the treatment of liver diseases are inadequate and sometimes can have serious side effects.[4] In the absence of reliable hepatoprotective drugs in Allopathic medical practice, herbs play a vital role in the management of various liver disease.[5] Several studies have been carried out to see hepatoprotective effect of plants such as *Feronia elephantum*[6], *Aerva Lanata*[4], *Costus Speciosus*[7], *Cleome Viscosa*.[3]

Tamarindus Indica, commonly known as tentul is a tree type plant belonging to the family Fabaceae. It is indigenous to tropical Africa and also cultivated in Bangladesh, India, Pakistan, Sudan, Java, Philippines, Indonesia and Spain. The fruit of tamarind is a digestive aid, laxative , expectorant, blood tonic. Other parts of plant show antioxidant[20], antihepatotoxic[9] ,antidiabetic[10], antiinflammatory[11] activities .

Hepatoprotective effect of *Tamarindus Indica* has also been studied using aqueous extract of leaf[12], fruit[13], seed.[12] Results of these studies showed that all of these are hepatoprotective. Studies suggest that hepatoprotective effect of *Tamarindus indica* is due to presence of flavonoids, ascorbic acid, β-carotene. This study was undertaken to see hepatoprotective effect of ethanolic extract of leaf & seed of *Tamarindus Indica* from paracetamol induced hepatotoxicity in rats.

METHODS

Plant Materials:

Leaves and seeds of *Tamarindus Indica* procured from Sirajganj and identified by plant taxonomy unit of Bangladesh National Herbarium with voucher specimen no. DACB-35524, which was deposited to herbarium.

Preparation of Plant extract:

Leaves and seeds were shade dried and powdered by electric blender and grinder machine. The powders were soaked separately in 95% ethanol. The extract so obtained was concentrated in vaccum rotatory

evaporator at 40-50°c until a paste was formed. Extract paste was freeze dried.

Drugs and Chemicals:
Paracetamol powder was obtained from Kumudini Pharmaceuticals Ltd., Bangladesh. Propylene Glycol was used as solvent for paracetamol powder.

Animals:
A total of 24 male Long Evan's rats (150-180gm) were used for this study. The animals were kept in well ventilated room in the animal house of Dhaka Medical College. A 12hr light / 12 hr dark cycle was maintained. They were given standard food pellets and allowed drinking water *ad libitum*. Ethical clearance for the use of animals was obtained from the committee constituted for the purpose.

Procedure:
A total of twenty four rats were taken and divided into four groups. Each group having six rats (n=6). Control group received normal diet *ad libitum*. Only paracetamol group received paracetamol (1500 mg/kg) for 12 days and two groups received paracetamol (1500mg/kg) along with ethanolic extract of leaf (1250 mg/kg) and seed (1250 mg/kg) of *Tamarindus indica* respectively for 12 days.

After 24 hours of last treatment, all rats were anaesthetized with light chloroform and blood were collected by Cardiac puncture and serum was separated for estimations of ALT, AST, ALP and bilirubin.

Histopathological Study:
Liver tissue was taken and fixed in 10% formalin and sections of liver tissue were embedded in paraffin and made blocks. Serial sections of blocks 3μ-5μ thickness were made and stained with Haematoxylin and Eosin and examined under microscope.

Statistical Analysis:
The values were expressed as mean ± SD. The statistical analysis was carried out by unpaired student's "t" test and $P<0.05$ was considered as significant.

Result
In rats treated with only paracetamol serum bilirubin, ALT, AST, ALP increased significantly as compared to control group. Significant decrease in serum bilirubin, ALT, AST, ALP was observed following administration of ethanolic extract of leaf & seed of *Tamarindus Indica* along with paracetamol (Table1). Histopathological examination of liver tissue in Paracetamol administered rats showed massive liver tissue necrosis with loss of cellular architecture and infiltration of neutrophil, macrophage and lymphocyte (Fig: 2). An almost return to normal architectutre of hepatic tissue was observed in rats that received ethanolic extract of leaf & seed of *Tamarindus Indica* (Fig : 3 & 4) along with paracetamol.

Table 1: Serum bilirubin, ALT, AST and ALP level in rats that received Paracetamol along with ethanolic extract of leaf and seed of Tamarindus Indica. (12 days)

Groups	Serum bilirubin (mg/dl)	Serum ALT (U/L)	Serum AST (U/L)	Serum ALP (U/L)
Control	0.51±0.16	43.33±3.20	38.367±3.56	98.00±14.03
Only Paracetamol (1500mg/kg)	0.93±0.20**	162.66±5.60***	144.66±7.78***	378.00±22.44***
Paracetamol (1500mg/kg)+ leafextract*T.indica* (1250mg/kg)	0.53±0.16*	63.16±5.04***	53.00±5.09***	202.00±25.64***
Paracetamol (1500mg/kg)+ seedextract*T.indica* (1250mg/kg)	0.67±0.16*	63.50±3.62***	57.83±6.18***	192.00±21.47***

n = 6. All the drugs were administered orally through ryles tube. Data expressed as mean ± SD. ***P<0.001 taken as significant.

Discussion:

Significant increase in serum bilirubin, ALT, AST and ALP following administration of paracetamol is an indicator of hepatotoxicity. Assessment of liver damage can be assessed by estimation of serum ALT, AST and ALP.[12] Necrosis results in the release of these enzymes into circulation, therefore, it can be measured in serum. High levels of AST indicate liver damage, ALT catalyses the conversion of alanine to pyruvate and glutamate and is released in similar manners, therefore, ALT is more specific to liver and is thus a better parameter for detecting liver damage.[14]

The results in present study showed significant damage to liver tissue following administration of paracetamol, confirmed by histopathological examination of liver tissue that showed massive necrosis and infiltration of macrophage and lymphocyte.

Paracetamol causes acute liver damage[15] due to excessive formation of highly reactive metabolite N-acetyl Parabenzoquinone-imine (NAPQI)[16], which conjugates with hepatic glutathone. Hepatic glutathone is depleted because of ingestion of large dose of paracetamol. NAPQI arylates essential nucleophilic macro molecules within hepatocytes, forming stable acetaminophen-protein adducts which are responsible for Acetaminophen induced hepatotoxicity.[17] Elevated enzymes level showed loss of functional integrity of hepatocytes.[18] Groups treated with ethanolic leaves and seeds extract of *Tamarindus Indica* showed significant change in liver architecture and tissue necrosis as revealed in histopathology which gradually became normal. The changes in biochemical values were consistent with the histopathological findings. Similar other studies have been carried out using aqueous extract of leaf[12], seed[12], fruit[13] extract of *Tamarindus Indica*. Results of these studies using water extract was almost similar to ethanolic extract of *Tamarindus Indica*. Hepatoprotective effect of *Tamarindus Indica* has been attributed due to presence of flavonoids, polyphenol, β-carotene, ascorbic acid.[19] A number of scientific reports indicated that flavonoids, β-carotene, ascorbic acid have protective effect on liver due to their antioxidant properties.[20]

Therefore *Tamarindus Indica* a very commonly used food can be applied for treatment of drugs or chemical induced hepatotoxicity. *Tamarindus Indica* is easily available, cheap and its fruit is consumed as popular food. Before clinical application further studies on its hepatoprotective effect might be carried out.

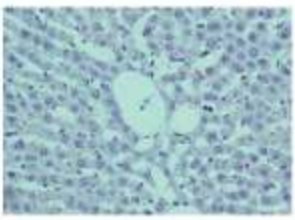

Fig-1 : Photomicrographs (Magnification at 40X objectives) showing the normal hepatic architecture in control group.

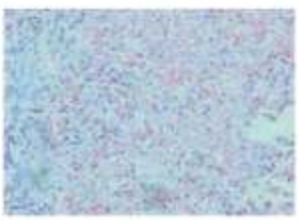

Fig-2 : Photomicrographs (Magnification at 40X objectives) showing Paracetamol induced hepatic necrosis and small number of inflammatory cells.

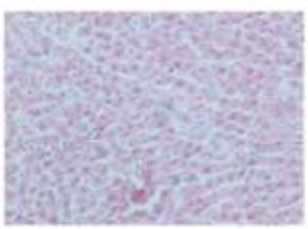

Fig-3: Photomicrographs (Magnification at 40X objectives) showing normal hepatic architecture following administration of leaf extract of *Tamarindus indica* along with Paracetamol.

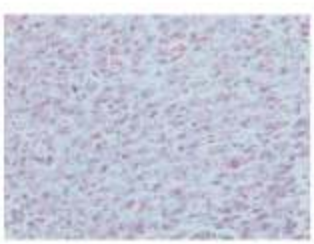

Fig-4: Photomicrographs (Magnification at 40X objectives) showing normal hepatic architecture following administration of seed extract of *Tamarindus indica* along with Paracetamol.

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Endoscopic Management of Steakhouse Syndrome

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Abstract

Background: Impaction of meat bolus over the lower oesophagus is known as "Steakhouse Syndrome" and is characterized by an abrupt onset of a dysphagia associated with odynophagia, drooling, chest pain, heartburn, neck pain, regurgitation and so on. During last fifty years, various management options like Glucagon, simethicone, carbonated beverages, a cocktail of tartaric acid and bicarbonate, hyoscine butylbromide, benzodiazepines, opioids etc. have been used. However flexible endoscopy has been advocated to be highly sensitive in diagnosis and management of steakhouse syndrome. **Objective:** In this study we wanted to evaluate efficacy of endoscopic management of steakhouse syndrome in two endoscopic set ups in Rajshahi city with limited facilities. **Methods:** Records of 19 patients with steakhouse syndrome were analysed on retrospective. We used a judicious combination of push and extraction techniques. We used topical oropharyngeal spray anesthesia with conscious sedation like Diazepam or midazolam and hyoscine N-butyl bromide. Resuscitation facilities were available. **Result:** Most of the patients were male and were in the 50-70 years age group. Almost 90% patients were treated successfully by endoscopic manipulation. Most (68%) of the interventions were carried out between 24 and 72 hours of incidence. Push technique was successful in most (70%) of the cases. **Conclusion:** Endoscopic manipulation with a differential approach is a reliable and safe procedure for management of steakhouse syndrome. The patients with suspected Steakhouse syndrome should be clinically evaluated and referred to a skilled and competent endoscopist at the earliest convenience.

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Introduction:

Acute food impaction of the oesophagus has been known for a long time as the "steakhouse syndrome" or the "backyard barbeque syndrome" and it is a medical emergency associated with obstruction of lower esophagus by poorly chewed bolus of food materials specially steaks and other forms of meat.[1] This is usually characterized by an abrupt onset of a dysphagia associated following food ingestion and it occurs more frequently in adults and elderly people. Patients suffering from Steakhouse syndrome experience dysphagia, odynophagia, drooling, chest pain, heartburn, neck pain, regurgitation, abdominal pain and even dyspnea. Considerable respiratory symptoms including stridor, coughing, wheezing or choking may result from aspiration of saliva or food and compression of the trachea by a large food bolus impaction.[2]

Steakhouse syndrome, in most cases, occurs due to incomplete and inadequate chewing of food. [3] The condition may, in about one third of cases, be associated with some preexisting esophageal abnormalities.[3,4] These include esophageal motility disorder, gastroesophageal reflux disease, Schatzkis ring, esophageal stricture, hiatus hernia, eosinophilic esophagitis, pill-induced esophageal ulcers, esophageal malignancy etc.[5-7]

It is important to differentiate steakhouse syndrome from a true foreign body impaction. A careful history taking, meticulous clinical examination, primary radiographic evaluation with plain X-ray is to be performed. However contrast x-ray is restricted because of the risk of aspiration. By far the most important investigation for esophageal obstruction is endoscopy of upper GIT, having advantages of delivering immediate management as well.[2] Furthermore, endoscopy can reveal the underlying esophageal pathology leading to the impaction and any associated mucosal damage.[7]

Conservative treatment includes injection of Glucagon at pharmacological doses which relaxes the lower esophageal sphincter, promoting the spontaneous passage of an impacted food bolus or facilitating endoscopic manipulation.[8] To be noted that Glucagon has very little effect on the motility of the proximal esophagus.[9] Chemical agents including simethicone, carbonated beverages like coca-cola and a cocktail of tartaric acid and bicarbonate have been used to treat acute esophageal food impactions with success.[10] These agents appears to work by releasing carbon dioxide in the esophagus, raising the intraluminal pressure against a closed upper esophageal sphincter, forcing the bolus into the stomach.[11] Other medical options like hyoscine butylbromide, benzodiazepines, opioids are also available.[12]

Management plan is often based entirely on clinical judgement.[12] However flexible endoscopy is highly sensitive in diagnosis and management of steakhouse syndrome. It also significant in detecting underlying esophageal pathology leading to the

impaction.[13] Removal of food bolus with flexible endoscopes has a high success rate and can be performed with conscious sedation in most adults.[13-15] Successful management is conditioned by factors including the experience and technical skills of the endoscopist and availability of necessary endoscopic accessories. These accessories include appropriately sized overtubes, polypectomy snares, rat-tooth and alligator forceps, a Roth retrieval net, Dormia basket, and Magill or Kelly grasping forceps etc. [16] This study was conducted to evaluate the role of endoscopic manipulation with limited facilities in the management of steakhouse syndrome.

Methods

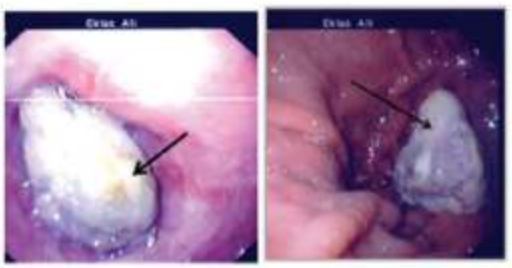
We retrospectively reviewed the records of all patients with dysphagia undergoing endoscopic examination of upper GIT during January 2010 and December 2014 in two endoscopy units of Rajshahi city. Records of 19 patients with steakhouse syndrome were analysed to evaluate the efficacy of endoscopic intervention in the management of steakhouse syndrome.

In our setup endoscopic examination of upper GIT was usually performed with topical oropharyngeal spray anesthesia. Conscious sedation like Diazepam or Midazolam with hyoscine N-butyl bromide was used as and when necessary. For management of steakhouse syndrome we used accessories such as polypectomy snares, alligator forceps and Kelly grasping forceps. Resuscitation facilities were available.

We used a judicious combination of push and extraction technique. The push technique was used with experience and good judgement. In some cases the endoscope could be successfully steered into the stomach before pushing the bolus. However, blind manipulation was stopped if any significant resistance was encountered and extraction technique was applied. Extraction technique was preferred when the food bolus was large, firm and was found to be associated with bones or sharp edges. It was also applied when pre-existing esophageal pathology was anticipated. This extraction technique was associated with repeated passes of the endoscope. After the food bolus had been removed, endoscopic evaluation of esophageal anatomy was performed.

Result

Outcome of endoscopic manipulation in 19 patients with steakhouse syndrome was analyzed on retrospective. Out of 19 patients, 16 (84%) were male. Age of the patients ranged from 48 years to 88 years. Mean age of the patients was 67.8 years. Most (13/19, 68.4%) of the patients were in the 50-70 years age group, 5 (26.3%) patients were > 70 years and only 1 (5.3%) patient was <50 years.

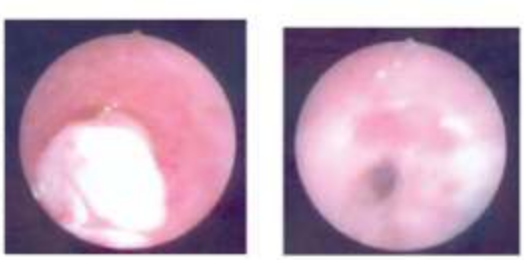


Impcted meat bolus in esophagus

Disimpacted meat bolus in stomach

Photograph 1. Impacted meat bolus in the esophagus was disimpacted and pushed into the Stomach

Out of 19 cases, 17 (89.5%) were treated successfully by endoscopic manipulation. In 12 (70.6%) patients out of 17, the meat bolus was safely and successfully pushed into the stomach (Photograph-1.). In 3 (17.6%) patients the meat bolus was extracted by appliances. In all these patients repeated passes of endoscope was necessary. One of these patients had benign esophageal stricture with esophageal candidiasis (photograph 2). Two patients (11.7%) were elderly patients in which risk of perforation due to pressure effect could not be excluded. In these patients the meat bolus were partially extracted and partially pushed into the stomach (Photograph 3). One of these patients had associated esophageal candidiasis.



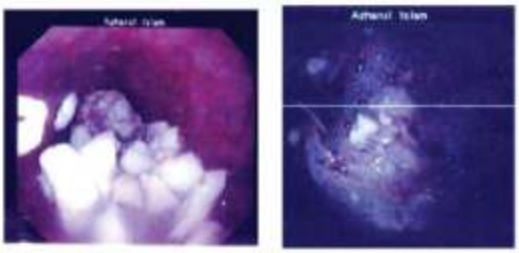
Impacted meat bolus in esophagus

Esophageal stricture with candidiasis

Photograph 2: Impacted meat bolus in the esophagus was disimpacted and extracted. There is stricture of lower end of esophagus

In our patients most (13/19 - 68.4%) of the endoscopic interventions were performed between 24-72 hours after the incidence of impaction. Five (26.3%) patients attended the endoscopy unit within

24 hours of incidence and only 1(5.3%) patient attended the endoscopy unit after 72 hours. Post manipulation complications were ulceration of lower esophageal mucosa in five out of 17 successful endoscopic manipulations (29.4%) cases.



Impcted meat bolus with egg pieces in esophagus

Disimpacted meat bolus with egg pieces in stomach

Potograph 3: Impacted meat bolus in the esophagus was disimpacted, partially extracted and partially pushed into the stomach.

In two case the endoscopic manipulation failed to resolve the obstruction and were referred to ENT units for management. One of these patients was suspected of having esophageal malignancy.

Discussion

Steakhouse syndrome, first reported by Norton et al in 1963, is caused by food impaction in the esophagus.[1] It is observed the food bolus obstruction of the lower esophagus is more common in elderly and old patients.[17] In our series most of the patients (13/19 - 68.4%) were in the 50-70 years age group (Mean 67.8 years).

The symptoms, clinical presentation and endoscopic findings of steakhouse syndrome require differentiation from other esophageal disorders, and must be considered in patients complaining of dysphagia.[7] As possible causes for esophageal food impaction, in one third of cases, several underlying obstructive lesions should be considered.[4] We had one patient with benign stricture of esophagus, two with esophageal candidiasis and another one with suspected lower esophageal malignancy.

Endoscopic removal is accepted as the most important management option for steakhouse syndrome. However, endoscopic intervention may require sedation or general anesthesia. We performed the procedures under conscious sedation like parenteral Diazepam or Midazolam as and when necessary.

When endoscopy reveals solid food impaction, an endoscopic polypectomy snare or grasping forceps can be used for extraction. If a fragmenting meat bolus is identified, a push technique can be performed.[4] Extraction technique was widely advocated and, historically, push technique was avoided because of the concern for associated distal obstructing lesions, or strictures and increased risk of perforation.[18] However, several authors have recently advocated using the push technique to guide the esophageal food bolus into the stomach.[19,20] Vicari et al reported a 97% success rate using the push technique for acute esophageal food impaction.[19] We were rewarded with push technique in most (70.6%) of the cases. Judicious combination of push and extraction technique in each individual patient lead to the success. Other historically noted approaches, including carbonated beverages or blind passage of a nasogastric tube to stimulate passage, are not endorsed. [21]

It is known that food bolus impactions that persist more than 12–24 hours confer more risk for serious complications, including esophageal perforations.[21] Local pressure-induced mucosal damage or perforation may be minimized by early removal of the meat bolus. So the patient should be subjected to urgent endoscopic evaluation as early as possible. In our patients most (13/19, 68%) of the endoscopic interventions were performed between 24-72 hours after the incidence of the disease. The delay in presentation may be due to illiteracy, lack of awareness, absence of endoscopic facilities in peripheral health service delivery setups and last but not least, superstitions and available indigenous management services in the rural area. Post manipulation complications were ulceration of lower esophageal mucosa in five (29.4%) cases.

Conclusions:

Steakhouse syndrome is an emergency in most of the cases. Endoscopic treatment with a differential approach in each individual patient is a reliable and safe procedure in skilled and expert hands with a high success rate and low morbidity and mortality. However to get the highest effective success the patients with suspected Steakhouse syndrome should be clinically evaluated and referred to the skilled and competent endoscopist at the earliest convenience.

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Urinary tract infection in pregnancy and its correlates

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Abstract

Background: Urinary tract infection (UTI) is one of the major health problems in pregnancy throughout the world. Prevalence of UTI during pregnancy is also very common in Bangladesh. **Objective:** To find out the proportion of the pregnant mothers having UTI and its correlates attending at Antenatal Clinic of Rajshahi Medical College Hospital. **Methods:** This was a cross-sectional study conducted among the pregnant mothers attending at Antenatal Clinic of Rajshahi Medical College Hospital (RMCH), Rajshahi, Bangladesh. Total 300 pregnant mothers were selected by random sampling with the view to find out the proportion of urinary tract infection (UTI) among the pregnant mothers and its correlates. Data were collected by a pretested semi structured interview schedule. The interview schedule was designed to record the health and socio-demographic status, and the symptoms of UTI if present. Data were analysed in computer using SPSS programe. Descriptive analytical techniques involving frequency distribution, computation of percentage, mean, SD etc. were applied. Association between variables were conducted applying Chi-square and Fisher's Exact test. **Results:** A total of 300 pregnant mothers, 26 (8.7%) were found to have urinary tract infection. UTI was common among the older and illiterate pregnant mothers . Dysuria and frequent micturation were the main symptoms of UTI among the pregnant mothers. **Conclusion:** The pregnant mothers and health care providers of the urban Rajshahi should be aware and motivated to take care about this problem..

Key wards: urinary tract infection, correlates, pregnancy, Bangladesh.

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Introduction

Urinary tract infection (UTI) is one of the major health problems all over the world.[1] The incidence of UTI among school girls is 1-2% and is only 0.03% in boys of the same age.[2] Twenty to 50 % of all the females experience at least one episode of UTI sometimes in their lives.[2,3] Not surprisingly infections of the urinary tract are the most common bacterial infections encountered during pregnancy also, with a prevalence ranging from 2% to 20%.[4-8] The urinary tract undergoes profound physiological and anatomical changes during pregnancy facilitating the development of UTI both symptomatic and asymptomatic in women.[9]

Prevalence of bacteriuria (both symptomatic and asymptomatic) during pregnancy is also very common in Bangladesh. Begum in her study found that 10% of pregnant women attended in antenatal clinic of Mymensingh Medical College had symptomatic urinary tract infection.[10] Khatun *et al.* in their study, observed that 30% of clinically healthy pregnant women attending at the institute of Post-graduate Medicine and Research had asymptomatic bacteriuria.[11] In rural and urban Rajshahi, the prevalence of asymptomatic bacteriuria were 12% and 14. 5% respectively.[12,13]

UTI during pregnancy depends upon some socio demographic, behavioural and biological risk factors like age, parity, socio-economic status, race, diabetes etc. The higher prevalence rates (11%) have been seen in socially indigent multiparas, as compared with about 2% in pregnant patients in private practice[14]. In a study among the pregnant women by Orrett FA *et al.*, it was more common in the 30-39 year age group, among parous women, among Negroes, and in patients with a low family income and overcrowded living conditions.[15]

The present study was undertaken to find out the proportion of the pregnant mothers having UTI and Justify its correlates attending at Antenatal Clinic of Rajshahi Medical College Hospital.

Methods

This was a cross-sectional descriptive type of study conducted at Antenatal Clinic of Rajshahi Medical College Hospital (RMCH), Rajshahi, Bangladesh. All the pregnant mothers attending at this clinic for their routine antenatal care constituted the study population. Total 300 pregnant mothers were selected by random sampling. Data were collected by a pretested semi structured interview schedule. The interview schedule was designed to record the socio-demographic characteristics, UTI status and the symptoms of UTI if present. Information were collected by face to face interview and antenatal check up card of the pregnant mothers, and or the attended doctor if needed after the end of their antenatal check up. When a mother was identified having UTI on the basis of routine urine analysis during the antenatal care, then the UTI related complaint(s) like turbid urine, frequent micturition, burning sensation during micturition , fever or pain in lumber region / lower abdomen was or were recorded

in the interview schedule. Pus cells > 5 per high power field were considered significant for infection. Before selecting the women, informed written consent was taken from each of them. Data were entered in the computer and processed using SPSS for windows. Descriptive analytical techniques involving frequency distribution, computation of percentage, mean, SD etc. were applied . However, association between variables were conducted applying Chi-square and Fisher's Exact test.

Results

A total no. of 300 pregnant mothers were included in the present study. Among them 26 mothers (8.7%) were found to have urinary tract infection (UTI) (Figure. 1).

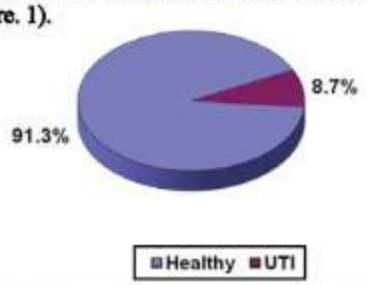

Figure. 1. Urinary tract infection(UTI) among the pregnant mothers attending at Antenatal Clinic of Rajshahi Medical College Hospital.

UTI among the illiterate pregnant mothers was 22.7% while it was found to be 6.6% and 7.8% among the pregnant mothers educated up to primary and high school or above level respectively. The differences of UTI among the pregnant mothers of different levels of educational status were statistically significant (p=0.049). UTI among the pregnant mothers aged >30 years was remarkably high than the other groups of pregnant mothers aged up to 20 years and 21-30 years. The association between UTI and mothers' age was close to statistical significance (p=0.057). Gestational age, monthly family income and parity were not significantly associated with UTI (Table 1).

Table 1 Correlates of Urinary tract infection. n = 300

Correlates	Health status		p-value
	Healthy n (%)	Urinary tract infection n (%)	
Gestational Age			
First trimester (n=29)	26 (89.7)	3 (10.3)	0.936*
Second trimester (n=62)	57 (91.9)	5 (8.1)	
Third trimester (n=209)	191 (91.4)	18 (8.6)	
Age (years)			
Up to 20 (n=111)	102 (91.9)	9 (8.1)	0.057*
21 – 30 (n=173)	160 (92.5)	13 (7.5)	
> 30 (n=16)	12 (75.0)	4 (25.0)	
Educational Status			
Illiterate (n=22)	17 (77.3)	5 (22.7)	0.049*
Primary (n=61)	57 (93.4)	4 (6.6)	
High school and above (n=217)	200 (92.2)	17 (7.8)	
Monthly family income			
Up to 10000/= (n=258)	236 (91.5)	22 (8.5)	0.50**
>10000/= (n=42)	38 (90.5)	4 (9.5)	
Parity			
Primipara (n=142)	131 (92.3)	11 (7.7)	0.571*
Multipara (n=151)	136 (90.1)	15 (9.9)	
Grandmultipara (n=7)	7 (100.0)	00(0.0)	

*Chi-square test applied, **Fisher's Exact test

A total 26 pregnant mothers having UTI, all of them had complain of frequent micturition and burning sensation during micturition. Twenty three percent of them complained about fever. Only 3.9% of the pregnant mothers having UTI had a complain of pain in lumber region/lower abdomen (Table 2).

Table 2 Symptoms of urinary tract infection. n = 26

Symptoms	Frequency N (%)
Frequent micturation	26 (100.0)
Burning sensation during micturation	26 (100.0)
Fever	6 (23.1)
Pain in lumber region/lower abdomen	1 (3.9)

Discussion

The prevalence of symptomatic bacteriuria in pregnancy varied from 2% - 28.5% in the different parts of the world. In developed countries, it was estimated that 2 to 10% of pregnant women suffer from any form of UTIs.[16-20] In Pakistan[18] and Egypt[19] it was 28.5% and 31.3% respectively. In a study by Selimuzzaman et al., it was found that 14.5% of the Metropolitan mothers of Rajshahi district have been suffering from asymptomatic bacteriuria.[13] The results of the present study and the previous studies in Rajshahi suggested that UTI is a health problem among the both rural and urban pregnant mothers of Rajshahi. It should take care both symptomatic as well as asymptomatic UTI. Because symptomatic UTI is a iceberg of asymptomatic UTI.[14]

There is still some controversy regarding the association of gestational age and UTI. Many studies have reported that pyelonephritis is more common during the second half of pregnancy, with an incidence peak during the last two trimesters of pregnancy.[21,22] Because it is estimated that 20% to 40% of pregnant women with asymptomatic bacteriuria in first trimester will develop symptoms in later period of gestation.[23] The susceptibility of UTI in later period of gestation is due to urethral dilatation which started as early as 6 week and reaching the maximum during 22-24 weeks.[24] On the other hand, many studies suggest that gestational age were not associated with UTI.[25,26] The present study findings agreed with the later group.

Advanced maternal age (≥ 35 years) was reported as risk factor for asymptomatic bacteriuria in pregnancy.[27] In the present study, it was also observed that the proportion of UTI among the mothers aged >30 markedly high than the lower age groups. This

difference was nearly significant. It suggests that symptomatic UTI also is associated with age as like as asymptomatic UTI.

A follow-up study on 249 pregnant women attending the antenatal care clinic at Zagazig,university hospital,Egypt, it was found that UTI was significantly more common among the illiterate mothers. Low educational level was identified as an important risk factor of UTI.[19] In this present study, it was also found that occurrence of UTI was more common among the mothers having low educational status.

The present study findings suggest that monthly family income and parity of the mothers were not associated with the occurrence of UTI among the pregnant mothers. It is consistent with the other studies.[5,6,12]

Burning with urination (dysuria) is the most significant symptom in pregnant women with symptomatic cystitis. Other symptoms include frequency, urgency, suprapubic pain, and hematuria in the absence of systemic symptoms. Fever (>38°C), shaking chills, costovertebral angle tenderness, anorexia, nausea, and vomiting are the common symptoms in Pyelonephritis.[28] In this present study, all of the pregnant mothers having UTI had complains of burning sensation during micturition (dysuria) and frequent micturition. Only 6 (23%) and 1 (3.9%) of them complained about fever and pain in lumber region/lower abdomen. These findings suggest that most of the UTI were lower urinary tract infections (cystitis) and less than one fourth of them were upper urinary tract infections (pyelonephritis).

The pregnant mothers specially the older and illiterate, and health care providers of the urban Rajshahi should be aware of this problem and motivate them to take care about it.

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Rain Water Harvesting Systems in Bangladesh: A Review

Zoha Mohammad Meherwar Hossain

Abstract

As the population of the world increases everyday, the demand of water for drinking and other domestic purposes also increases at the same rate. But the rate of utilization of surface and groundwater resources is much faster than that of their recharge. This is one of the reasons for scarcity of water. There are also other reasons for scarcity of water as the contamination of surface and ground water. The situation is very much concerning and the fact is not so different for Bangladesh. The scarcity of water in Bangladesh are due to over-exploitation of ground water aquifers specially in big cities and Barendro region, natural arsenic contamination of ground water in 61 districts, salinity in the coastal regions and lack of surface water and also lack of easy access to the aquifers due to hilly and rocky topography in the Chittagong Hill Tracts Region of Bangladesh. The benefits of this alternate source of water are found to curtail the burden on the public water supply, to be cost effective, to be used in case of emergency, to increase soil moisture to develop vegetation and to develop the chance of ground water recharge. Cost comparison and associated benefit between a rainwater harvesting system (RWHS) and traditional water supply system encountered and revealed a rainwater harvesting system as a cost-effective technology in Bangladesh especially in places where water is not easily available to consumers. Bangladesh government and NGOs should take clear steps forward for building RWHS to combat the situation. Mass education should be spread to aware the common people about the technology, benefits and cost effectiveness of rainwater harvesting system.

Key words: rainwater harvesting system, Bangladesh

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Introduction

Millions of the people of the world have no access to water for drinking and other domestic purposes. The JMP Thematic Report on Drinking Water 2011 by UNICEF and WHO stated that768 million people still use unsafe drinking water sources. The report also said that in 2008, 40% of the total population of the world (about 884 million people) had no access to improved drinking water sources and of those people without access to improved sources of drinking water, 25% live in Southern Asia.[1] The situation is very much concerning and the fact is not so different for Bangladesh. So we see that scarcity of water is everywhere in the world, as it is also in Bangladesh.

As the population of the world increases everyday, the demand of water for drinking and other domestic purposes also increases at the same rate. But the rate of utilization of surface and groundwater resources is much faster than that of their recharge. So the aquifers are on an increased pressure to supply water. This is one of the reasons for scarcity of water. There is also contamination of surface and ground water.[2] The sources of surface water pollution are mainly sewage, industrial and trade waste including physical pollutants and agricultural pollutants.[2,3] Rashid, Rahman and Hyder (2012) stated water can be polluted at the different levels such as at the source, during its distribution and also during the storage from its container or storage tank. They demanded that Rainwater can be a good source of drinking water specially in the villages of Bangladesh.[4] Ahmed et al. (2012) showed how the surface water sources of Dhaka, Bangladesh are being polluted by the industrial effluents.[5] On the other hand, the ground water contamination in Bangladesh are due to salinity from salt water incursion in the coastal areas[6,7]and naturally occurring arsenic contamination in the northern and middle zones of the country.[6,8] The hilly areas of Bangladesh have also scarcity of water specially due to its characteristic topography and other geographical phenomena.[9]

In this situation of crisis, it is very much essential to look for alternative sources to meet the over-demand of water and Rainwater Harvesting is thought to be one.[10] So many organizations installed hundreds of Rainwater Harvesting System in different areas of Bangladesh to solve the problem and their attempt is considered more or less successful. This review article is attempted to reveal the benefits, quality, cost effectiveness, effect on climate and the reasons of harvesting Rain Water in different parts of Bangladesh.

What Rainwater Harvesting System (RWHS) is ?

Rainwater harvesting is the accumulation and deposition of rainwater for reuse before it reaches the aquifer. The harvested water can be used as drinking water as well as for storage and other purposes like irrigation.[11]

A report of UNEP (2009) stated that rainwater

harvesting locally collects and stores rainfall through different technologies, for future use to meet the demands of human consumption or human activities.[12]

A definition in a clear and more simple language is given by Norma Khoury-Nolde (in her website last accessed on 30 June, 2014). She defined Rainwater Harvesting as a technology used to collect, convey and store rain for later use from relatively clean surfaces such as a roof, land surface or rock catchment. The water is generally stored in a rainwater tank or directed to recharge groundwater. Rainwater infiltration is another aspect of rainwater harvesting playing an important role in storm water management and in the replenishment of the groundwater levels.[13]

Thomas and Martinson (2007) used the term 'Roof water Harvesting' as a subset of 'Rainwater Harvesting' as the later term is much broader though very widely used. They wrote (in their book 'Roofwater Harvesting: A Handbook for Practitioners') - 'Rainwater harvesting' is a widely used term covering all those techniques where by rain is intercepted and used 'close' to where it first reaches the earth. The term hasbeen applied to arrangements to cause rainfall to percolate the ground rather thanrun off its surface, to forms of flood control, to the construction of small reservoirs to capture run-off water so that it can be used for cattle or micro-irrigation and to the collection of run-off from roofs and other impermeable surfaces. Thus, roof water harvesting is a subset of rainwater harvesting, albeit an important one.[14] Their term is very much suitable in the context of our country as most of the Rainwater Harvesting Systems here use the roof as the catchment area.

Why and where Rainwater Harvesting System (RWHS) is ?

The practice of Rainwater Harvesting in our country is mainly to supply water for drinking and domestic purposes due to scarcity of water from the groundwater or surface water sources. This scarcity of water is caused as a result of lack of sufficient water or lowering of the water-table in the aquifers in some areas (due to excess withdrawal of water to meet the over demand of the fast expanding community or due to drought), or as a result of contamination of groundwater or the surface water sources in some other areas. There are also combined causes in some of the places. To combat this situation of scarcity of water, Rainwater Harvesting System is installed in many of the areas of the country. These reasons of scarcity of water, for which rain water harvesting systems are installed, are showed in brief in Table – 1.

Table 1: Reasons for RWHS in different areas of Bangladesh

Regions of Bangladesh	Reasons for using RWHS	Use of Harvested Water	Source of Information
Arsenic Affected Areas (61 districts)	Arsenic contamination of ground water	Drinking& domestic use	i) Reference – 19: Rahman MH et al (2002); ii) Reference – 22: Ivanov J, Tobias R and Molaer HJ (2013).
Dhaka	Lack of water in aquifers (due to over exploitation)	Drinking, recharge of ground water and toilet flushing & gardening	i) Reference – 23: Jahan and Haider (2012); ii) Reference – 24: Paul S (2012) iii) Reference – 25: Rashid and Ahmed (2012).
Coastal regions	Salt water incursion& lack of availability of suitable fresh water aquifer.	Drinking& domestic use	i) Reference – 6: Bangladesh Rio plus 20: National Report on Sustainable Development 2012. ii) Reference – 7: UN-HABITAT 2005
Hilly regions, specially Chittagong Hill Tracts	Lack of surface water and also lack of easy access to the aquifers due to hilly and rocky topography	Drinking & domestic use	i) Reference – 32: UNICEF, Chittagong Hill Tracts ii) Reference – 33: Alam R et al (2012).

Source: BBS 2012[48].

Of all the causes of scarcity of water mentioned above, for which Rainwater Harvesting System (RWHS) is suggested and installed as the alternate source of water in Bangladesh, the naturally occurring arsenic contamination of the groundwater is considered the worst of all. It was first detected in Bangladesh in 1993. With varying levels of contamination from region to region, groundwater in 61 out of the 64 districts in Bangladesh was found contaminated with arsenic. A total of 4.7 million tubewells in the country had been tested and 1.4 million of those were found to contain arsenic above the Government drinking water limit of 50 parts per billion (ppb). It was also reported that out of the Bangladeshi population of 125.5 million, up to 57 million people consumed water that had an arsenic concentration greater than the WHO guideline value and up to 35 million people consumed water that had concentrations in excess of the Bangladesh standard. The waters in the southwest and southeast parts of Bangladesh were found highly contaminated with arsenic.[15,16,17] [The WHO Guideline value for arsenic in drinking water is set at 10 ppb].[18] Nationwide, approximately 20 per cent of shallow tubewells were found contaminated. There were more than 8,000 villages where 80 per cent of all tubewells were contaminated. About 20 million people in Bangladesh were using tubewells with more than 50ppb of arsenic.[17]

Rahman MH et al. (2002) also declared that arsenic in groundwater above 50 µg/L had been found in 61 districts (these included the number of administrative areas with at least one sample exceed 50 µg/L of

arsenic) out of total 64 districts in Bangladesh.[19] This finding was based on the studies conducted by British Geological Survey (BGS),Department of Public Health Engineering (DPHE), Mott MacDonald Limited (MML) and Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP). BGS, DPHE and MML conducted the study in two phases and examined 3,534 distributed water samples from 61 districts (except 3 hill districts) in an approximate grid of6km x 6km.[16,20] These included an average of 58 samples per district and 8 samples per Upazilla (the lowest administrative unit), and 25% tested samples exceeded the concentration of 50 µg/L, Bangladesh Standard but 42% tested samples exceed the concentration of 10 µg/L, provisional World Health Organization (WHO) guideline value for arsenic in drinking water[18]. And in terms of population, about 20 million and 45 million people were found to be exposed to concentrations above the national standard of 50 µg/L and the World Health Organization's guideline value of 10 µg/L, respectively.[21]

So Rahman MH et al. (2002) suggested Rainwater Harvesting as one of the major alternate sources of water for drinking purpose here, as rainwater is available in abundance during the rainy season in this country.[19] And for this reason, many of the Rainwater Harvesting systems were installed as one of the major alternate sources of drinking water in these arsenic affected regions of Bangladesh.[22]

Jahan and Haider (2012) said that the water situation of Dhaka is the worst of all the cities of Bangladesh with rapid population growth and unplanned infrastructural development. Excessive withdrawal from upper aquifer created large groundwater depression in upper aquifer at the central part of the city. It was estimated that groundwater table of upper aquifer is declining at a rate of 3 m/year in Dhaka city posing a new challenge for the entire community. On the other hand, water-bodies are disappearing very rapidly from the city and at the same time, paved areas are increasing very fast. All these factors had serious implications which reduce natural vertical recharge of groundwater. As a result, there is scarcity of water. They also stated that the average annual rainfall in Dhaka is more than 2100 mm which is about three times of the world's average. Unfortunately, there was no plan for using this huge amount of rainwater to contend the water crisis in Dhaka and other cities.[23] In this situation, the Rainwater Harvesting Systems in Dhaka city were installed to supply water for drinking and domestic purposes. Some of them were set up to recharge the aquifers too.[24] Sultana and Ahmed (2012) identified 24 potential sites necessary for artificial recharge of the aquifer of the region of Dhaka City and they recommended rooftop rainwater harvesting as one of the effective methods for the purpose.[25]

Rashid and Ahmed (2012) suggested that every home should have its own collection system to get enough rainwater for the use of flushing and gardening in Dhaka City.[26]

Saline contamination of the surface water and the salt-water incursion of the aquifers are the main problems in the coastal region of Bangladesh. Due to non-availability of suitable surface and ground water sources (high salinity and non-existence of shallow aquifer), Rainwater Harvesting (RWH) has been practiced for a long time for drinking water supply in these areas.[27] During the last few years, several programs have been undertaken by government and international organizations to promote rainwater harvesting in the region.[28] Rahman and Dakua (2012) also discovered that Rainwater Harvesting system is practiced in some of these areas as an alternate source of drinking water.[29]

Khanom and Salehin (2012) found salinity in the surface and ground water in the areas of Tungipara, Gopalganj district causing a lot of problems to human health and agriculture there. They also suggested Rainwater harvesting system to solve the problem.[30]

The Centre for Coastal Environmental Conservation (CCEC) constructed 14000 Litre capacity Ground Rainwater Harvesting Systems for only 175 beneficiaries of 35 families in the cyclone affected Sundarban coastal communities in the district of Satkhira and they recommended that more alternative sources of drinking water should be constructed to combat the drinking water crisis in the region.[31]

In the hill tracts of Bangladesh, the main reason for the crisis of water is lack of shallow aquifers and also lack of sufficient surface water due to the hilly and rocky topography of the area.[32] UNICEF also declared that access to safe drinking water in Chittagong Hill Tracts (CHT) had been difficult due to the topography of the area. Often the safe water options available are costly and require specific technical support not easily found in the region[33]. This fact is also supported by Alam et al. (2012), who found in their study that there is lack of suitable groundwater aquifers in the hilly areas and the cost of setting up tube-wells is very high due to deep underground water table and stony layers.[34]

Ahmed et al. (2013) said that the hilly region of Bangladesh has serious water source problem, though it lies in high rainfall areas. They commented that proper harvesting system can utilize the rainfall properly and can be used for both storage and groundwater recharge.[35] In fact the people of hilly areas like Kaptai, Bandarban and other hilltract areas harvest rainwater locally to use the collected water for household as well as for irrigation and navigation purposes.

Kabir and Faisal (1999) stated more specifically that the indigenous people living in the hilly areas of Bangladesh have practiced water harvesting for centuries. As many as fifty-two indigenous methods had been indentified that are being practiced by tribal people of Bangladesh for watershed management as shown in that study.[36] The main difference of these systems from that of the flat plain land is the catchment area, which is only the ground surface here (instead of rooftops in the flat lands) and water is stored subsequently in wells, ponds etc.

In a socio-economic baseline survey of Chittagong Hill Tracts, Barkat et al (2009) found crisis of drinking water almost all over the area and they also discovered many of the tribal people traditionally harvest rainwater to use for drinking and cooking.[37]

Dev Con (2009) found that only 60% people in CHT region have access to safe water, which abnormally reduce to 4% in the dry season. It was also found that traditional water supply technologies such as tube wells, ring wells etc are not workable in all places. Ground water is not available in most parts of the towns. So different technologies are feasible for different areas.[38]

According to the study by Mainuddin et al (2007), water from the deep set tube-wells during dry season was found inadequate by all the respondents there, while it was found adequate during non-dry season by 67% only. Piped water supply is not available for 50% of the people. The study was conducted in the three hilly districts of Chittagong Hill Tracts i.e. Khagrachhari, Rangamati and Bandarban. And the overall condition of availability of water is not satisfactory.[39]

So Rain Water Harvesting System may be proposed as a good alternate source of drinking and other household purposes in this region. Actually it was practiced there traditionally for long.

Benefits of Rainwater Harvesting

Rainwater harvesting is a simple and primary technique of collecting water from natural rainfall. At the time of a water crisis, it would be the most easily adaptable method of mitigating water scarcity specially due to arsenic and saline contamination. The system is applicable for both critical and normal situations. It is an environmentally friendly technique that includes efficient collection and storage that greatly helps local people. The associated advantages of rainwater harvesting are that

(i) it can curtail the burden on the public water supply;

(ii) it can be used in case of an emergency (i.e., fire);

(iii) it is solely cost effective as installation cost is low, and it can reduce expense that one has to pay for water bills;

(iv) it extends soil moisture levels for development of vegetation;

(v) groundwater level is highly recharged during rainfall.[40]

Quality of Rainwater

The quality of harvested rainwater is an important issue, as it could be utilized for drinking purposes. Quality of captured water from roof top depends on both roof top quality and surrounding environmental conditions, that is, local climate, atmospheric pollution, and so forth.[41] Tests must be performed to check its viability and applicability before using as drinking water. Previous researches [42-44] showed that water quality of collected water did not always meet standard limits due to unprotected collection. Local treatment of harvested water could easily make water potable. Again rainwater could be also identified as non-potable sources for the purpose of washing, toilet flushing, gardening, and so forth, where quality is not a great concern. In this respect, treatment of collected water is of no such importance; rather it is used for household purposes.

Cost Effectiveness Analysis

The financial benefit associated with a rainwater harvesting system is solely connected with cost. The associated costs of a rainwater harvesting system are for installation, operation, and maintenance. Of the costs for installation, the storage tank represents the largest investment, which can vary between 30% and 45% of the total cost of the system dependent on system size. A pump, pressure controller, and fittings in addition to the plumber's labor represent other major costs of the investment. Rainwater provides sufficient quantity of water with small cost. Hence, the system can promote significant water saving in residential buildings in many countries. Herrmann

and Schmida[45] studied that potential saving of roof captures water was about 30–60% of potable water demand in a house depending on the demand and catchment area. Coombes et al. [46] analyzed 27 houses in Australia with rainwater harvesting system and found that about 60% of potable water could be saved. A case study in Dhaka city showed that the total cost related to construction and yearly maintenance of a rainwater harvesting system in a building with 1850 sq.ft catchment area for 20 years' economic life is about 30000 BDT. About 300 thousands liter water can be harvested from rain over one year in this building. The yearly consumption of this selected building stands at approximately 3000 thousands liters.[40] Therefore utilizing harvested rainwater for this building can save up to 10% of the public water supply annually. This volume of rainwater can serve a building with 60 members for about 1.5 months in a year without the help of traditional water supply. Furthermore, considering Dhaka WASA current water bill, about 8360 BDT can be saved per year, and about 125400 BDT can be saved in 15 years if rainwater is used for daily consumption. So, within three to four years, the installation cost of a rainwater harvesting system can be easily returned. Moreover, the building owner would be exempted from paying large amount of water bill as well as additional taxes and fees charged by the city authority with the water bill if rainwater is utilized for daily consumption. Cost comparison and associated benefit between a rainwater harvesting system and traditional water supply system encountered and revealed a rainwater harvesting system as a cost-effective technology in Bangladesh especially in places where water is not easily available to consumers.

Effect on Climate

Conventional use of water imparts critical impacts on natural resources. Water collection from ground and surface sources, treatment, and distribution are closely associated with energy consumption, however, being related to climate consequences. The extraction of water from the sources, the treatment of raw water up to the drinking standards and the delivery of water to the consumers require high energy. Moreover, there should be some energy losses during performing extracting, treating, and delivering of water. Therefore, the water sector consumes a huge amount of electricity from local and national grid. Approximately 300 billion kilowatt hours of energy could be saved if potable water demand could be reduced by 10%.[47] Adoption of RWHS is one of the most potential solutions that could save energy directly by reducing potable water demand. Reduction of water demand by 1 million gallons can result in savings of electricity use by 1,500kWh. In the previously mentioned case study, with an 1850 sq. ft. catchment area, about 300 thousands liters could be harvested over one year. However, this amount could reduce potable water demand and approximately 100kWh electricity could be saved in the selected residential building by introducing rainwater capturing system. Integrating rainwater harvesting system with the conventional water collection and distribution approach in residential as well as large scale, nonresidential applications suggest a potential method of reducing energy use. However, limiting energy demand has critical impact on carbon dioxide emissions, as release of carbon dioxide is closely associated with electricity generation. There should have sufficient reduction in carbon dioxide emissions when fossil fuel is used for power generation. Hence, limited contribution is to be expected from lower carbon release in climate change concept. However, water use should be critically judged from availability, safety, and sustainability of natural resources. Energy conservation is a critical component in sustainability concern. Decreased use of conventional potable water reduces energy demand that in turn reduces emission of carbon dioxide. Integrated water management approach with rainwater harvesting along with gray water and reclaimed water reuse could limit contributions to climate change and conserve limited water and energy resources in Bangladesh.

Conclusion

As the population of this country is growing fast, the demand for water is also increasing very fast. The water table is lowering day by day, and the recharge of groundwater table is facing difficulties. But the alternate sources of water are not yet given proper emphasis both at the policy makers' level as well as at the level of common people. Some voluntary organizations are working to install rainwater harvesting system in the regions of water crisis throughout the country, but the coverage is still not very satisfactory. So it is the government sector who should take clear steps forward to combat the situation. Mass education should be spread to aware

the common people. The technology for rainwater harvesting system should also be available and cheap everywhere.

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Primary Ovarian Non- Hodgkin's Lymphoma: A Rare Case Scenario

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Abstract

One of the very rare types of the ovarian tumor is lymphoma. Lymphoma, presenting with ovarian mass as an initial manifestation, is a rare entity and may cause confusion for the clinician since its presentation might resemble with others, much more frequent primary ovarian tumors. To report an uncommon case of primary ovarian Non- Hodgkin's lymphoma in a peri- menarche girl with an attempt to delineate the clinical features and characteristics of this tumor with respect to histological findings. A 13-year of aged young girl was admitted with signs and symptoms suggestive of an ovarian tumor. Histopathology of the ovarian mass was done after an exploratory laparotomy. After surgery, Computed tomography (CT) of the chest, abdomen and pelvis, serum CA-125 and a bone marrow study were also done. Computed tomography revealed a heterogeneous mass, measuring 6.5×5.5 cm in diameter. Diagnosis of Non-Hodgkin's lymphoma was made on histopathology. Tumor was classified as a diffuse large B cell lymphoma. The patient was treated with surgery followed by chemostherapy using standard CHOP regimen using cyclophosphamide, doxorubicin, vincristine and prednisolone. She has now been without disease for 9 months after the surgery and chemotherapy. According to previous reports the treatment principles and prognosis of primary ovarian lymphoma is the same as that of other nodal lymphomas.

Keywords: primary Lymphoma, ovary.

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INTRODUCTION

Involvement of the ovary by malignant lymphoma is a well-known late manifestation of disseminated nodal disease. But primary ovarian lymphoma is rare. Primary ovarian Non-Hodgkin's lymphoma accounts for 0.5% of all Non-Hodgkin's lymphomas and 1.5% of all ovarian neoplasm, with diffuse large B cell lymphoma being the commonest type.[1]The origin of these rare tumors is controversial. There has been debated as to whether lymphoma can arise de novo in the ovary; lymphoid aggregates do exist in normal ovarian tissue, which could give rise to such lesions. The malignant transformation of benign lymphoid infiltrates seen in up to 50% of normal ovaries, as suggested by Monterroso *et al.* may partly explain their pathogenesis.[2] The symptoms are nonspecific, but presence of constitutional symptoms and the rapid progression in a young patient should raise the suspicion of a lymphoma. The probability of tumor lysis syndrome is very high in this setting. Fox *et al.* suggested diagnostic criteria for primary ovarian lymphoma, which needs (a) the disease to be confined to the ovary, (b) absence of disease in the blood and bone marrow and (c) the extraovarian deposits, if any, should appear at least after few months.[3]

Lymphomas are diagnosed based on histopathological findings, immunophenotyping, and cytogenetic tests. Diagnostic staging is established by means of clinical picture, laboratory analysis, biopsy ,X rays, CT, MRI, contrast scan, various endoscopies and scintigraphy of certain organ or if necessary of the whole body.[4]

The prognosis of ovarian lymphomas is excellent.[5] B cell lymphomas far better than T cell histologies. The treatment is mainly combination chemotherapy and the protocol depends on the primary histology. The role of surgery is debatable with present day chemotherapy regimes. We hereby report an uncommon case of primary ovarian Non- Hodgkin's lymphoma in a peri- menarche girl with an attempt to delineate the clinical features and characteristics of this tumor with respect to histological findings.

CASE REPORT

A young peri- menarche young girl, aged 13 years was admitted to Gyne & obstetric department of our hospital with the complaints of fever for one month, weight loss, pain and heaviness in the lower abdomen. Physical examination revealed a mobile abdominal mass, mobile with regard to the deep and superficial plains; ascites positive on percussion. Computed tomography (CT) showed a heterogeneous mass, measuring 6.5×5.5 cm in diameter, in the area of the left uterine adnexa ; there were no enlarged lymph nodes. The serum tumor

markers were positive, with CA-125 being 252 U/ml (normal < 25 U/ml). The erythrocyte sedimentation rate was increased, being 85 mm in the first hour.

An exploratory laparotomy was done through a abdominal vertical midline incision so as to establish the diagnosis. Removal of tumor with left salpingo-oophorectomy was performed; there were no peritoneal implants, hepatic metastases, or adenomegaly. On gross examination the left ovary was enlarged showing a solid nodule measuring approximately 6.3x 5.6x 5.1 cm with a grey white cut-surface (Figure 1).

Figure1: A well circumscribed solid mass with a grey white cut-surface.

Histopathology of the left ovarian mass was reported to be consistent with diffuse large B-cell lymphoma, Non-Hodgkin's lymphoma (2008 WHO Classification) based on morphological and immunohistochemical features (Figure-2). Most of the neoplastic cells were positive for CD-20 and for leucocyte common antigen (LCA) antibody. After surgery, CT of the chest, abdomen, and pelvis was normal and serum CA-125 was also normal. A bone marrow study showed no abnormalities. The patient was prescribed eight cycles of the standard CHOP regimen using cyclophosphamide, doxorubicin, vincristine and prednisolone. She has completed eight cycles and, 9 months after surgery, she remains disease free.

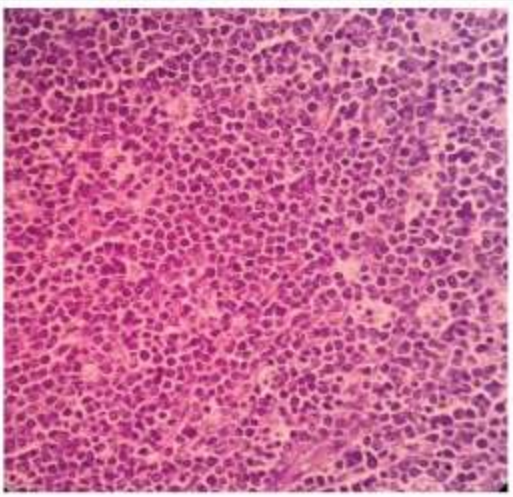

Figure 2 Histopathology showing diffuse large B-cell Non-Hodgkin's lymphoma.
(Haematoxylin and eosin, × 40)

DISCUSSION

Genital tract involvement in Non-Hodgkin's lymphoma is uncommon. However, when involved, the ovary seems to be one of the more common anatomic sites (25%).[6] Ovarian involvement is usually secondary, occurring as part of a systemic disease. Localized primary lymphoma of the ovary is unusual and rare, with few reported cases. The distinction is important because primary extra nodal lymphoma runs a less aggressive course with 5 year survival rate of 80% as compared to secondary malignant lymphoma, which has a 5 year survival rate of only 33%.[7] But diagnosis of primary lymphoma may still be considered if the spread has occurred to the adjacent lymph nodes or to the immediately adjacent structures. In our case there was no obvious lymphadenopathy and blood, bone marrow, spleen or hepatic involvement. All these findings favour the diagnosis of primary ovarian lymphoma.

Lymphomas of the ovary may occur at any age, but mostly women in their 40s are affected.[6,7] In our case this lymphoma was diagnosed in a very young age of 13 years. Whether primary or secondary, ovarian lymphomas may have varied presentation, most of them being discovered

incidentally during the work up for pelvic or abdominal complaints.[6] Patients presenting with rapid onset abdominal pain and distension had worse prognosis.[3] Our patient also presented with rapid onset of abdominal pain and distension which proved fatal. The majority of primary ovarian lymphomas present with pelvic complaints; some cases present with ascites and elevated serum CA-125.[8] Our patient presented with a pelvic mass and elevated serum CA- 125.

The histological appearances of lymphoma in the ovary are generally similar to those seen in the extra ovarian sites. In the ovary, however, there is a great tendency for the tumor cells to grow in cords and nests, appearing to cling to the reticulin, forming pseudoacini. The most common types of lymphomas encountered in the ovary are diffuse large cell, Burkitt and follicular lymphomas. Rarely precursor B-cell lymphoblastic lymphomas are also encountered. However, these need to be distinguished from other round cell tumors such as metastatic poorly differentiated carcinoma, especially of mammary origin; primary small cell carcinoma; adult granulosa cell tumor; granulocytic sarcomas and dysgerminoma. Immunohistochemical studies will help to distinguish between these tumors.[9] It should be noted that diffuse infiltration of the adjacent fallopian tube and/ or broad ligament is much more common in lymphomas than in most of the tumors in the differential diagnosis.

Dysgerminomas may be indistinguishable on gross examination from malignant lymphomas. However, on microscopic examination, the nuclei and immunohistochemical features are strikingly different. Microscopically the cells of dysgerminoma are uniform with PAS+ve, diastase sensitive, clear cytoplasm whereas in lymphoma cytoplasm is scanty and PAS negative.[6] Granulocytic sarcomas should be considered when one is evaluating cases of suspected ovarian lymphoma. Granulocytic sarcoma on routine stains is often composed of cells with more finely dispersed chromatin and abundant deeply eosinophilic cytoplasm compared to lymphoma cells which have nuclei of same size with coarse chromatin and scanty cytoplasm. The findings of granulated myelocytes are diagnostic of granulocytic sarcoma.[6,10]

The single file arrangement of lymphoma cells may simulate metastatic carcinoma particularly one of breast origin.[3,10] However in such cases history of primary mammary carcinoma is present. Morphologically cells in breast carcinoma have irregular margins, they retain their intercellular attachments, form cohesive sheets and at times produce small amount of intracytoplasmic mucin[10]. Granulosa cell tumours are distinguished from lymphoma by grooved nuclei, formation of Call- Exner bodies and tendency to merge with thecomatous areas.[10]

Immunohistochemistry in our case showed positivity of tumor cells for B lineage markers (CD20 and LCA) and negativity for T lineage markers (CD3 and CD43). On the basis of microscopic findings supported by immunohistochemistry, diagnosis of primary diffuse large B-cell Non-Hodgkin's lymphoma of the ovary was made.

The protocol of chemotherapy used in diffuse, large B-cell Non-Hodgkin's lymphoma is the standard CHOP regimen. Our patient was treated with left salpingo-oophorectomy and appendectomy followed by eight cycles of CHOP. The outcome of these patients, treated with appropriate chemotherapy, appears to be similar to that of patients with other nodal Non-Hodgkin's lymphomas.

Conclusion

Primary lymphoma of the ovary is a rare entity. It needs to be differentiated from other ovarian malignancies, as its management differs from other primary and metastatic ovarian tumors.

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