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CONTENTS

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CONTENTS

Chest & Heart Journal
Vol. 28, No.-1, January 2004

ORIGINAL ARTICLES

A Scientific Dietary Plan of Chronic Obstructive Pulmonary Disease (COPD) Patients

Rubina Akthar Bethe[1], Nur Ahmed[2], Shah Md. Keramat Ali[2]

Abstract

High carbohydrate diet increases CO_2 production in CODD subjects. Since the COPD patients have already elevated level of CO_2 in blood, more carbohydrate diet may contribute difficulty in breathing. To examine the effectiveness of low carbohydrate diets in 12 COPD patients admitted in ICU of BSMMU Hospital the present study was carried out. The diet containing 1600 kcal, 112 gm carbohydrate, 68 gm protein and 98 gm fat was given orally and by tube feeding. The result showed that out 58.7% patients improved in their condition and the rate of improvement was more after 3 and more days. The patients with COPD may be given the recommended diets for at least 3 days and to be continued for better improvement.

[Chest & Heart Journal 2004; 28(1) : 1-3]

Introduction

High carbohydrate meals are associated with an increase in carbon dioxide production and PCO_2 (partial pressure of CO_2) in blood and thereby decreases the ability of physical activity[1]. During the absorption of a large carbohydrate laden meal, liver glycolysis is activated contributing two molecules of carbondioxide along with energy and water[2] from one glucose. In good health, the extra load of carbon dioxide can be handled easily. But in COPD (chronic obstructive pulmonary disease), the patients have already elevated level of CO_2 in blood and hence more carbohydrate diet may be harmful. The objective of the study is to examine the effectiveness of the low carbohydrate diets given to COPD patients admitted in Intensive Care Unit (CU) of BSMMU Hospital and also to suggest an appropriate high fat and low carbohydrate diet. This proposed diet will be more effective in reducing carbon dioxide production and may help the COPD subjects to breath normally and thereby the effect of nutritional support in the management of patients with COPD will ease their living despite the presence of COPD.

Materials and Methods

COPD diet: Retrospective analysis of diets provided to 12 COPD patients, admitted in intensive care unit (ICU) of Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, during year 2003 was done. These patients were given about 1600 kcal energy, 68 g protein, 98 g fat and 112 g carbohydrate (Table I, Table II) while they were under treatment in the hospital. For this purpose the total calorie requirement was calculated using BMR. Since the COPD patients are usually bed ridden their physical activities are also restricted and hence their physical activities are also negligible. Calorie requirement of COPD patients were calculated as per recommendation of FAO/WHO Joint Expert consultants, 1985[3]. The energy content of the COPD diets and amount of carbohydrate, protein, fat were calculated on the basis of Indian food table[4] and Nutritive value of Bangladeshi foods[5]. The results are presented in the following tables.

Results

The patients, who could eat food by mouth were given the diet shown in Table I. This diet provided total energy of about 1600 kcal, 111.7 gm carbohydrate, 67.4 gm protein and 98.8 gm fat, which were about 28, 17 and 55 percent of total calorie. This diet is very low in carbohydrate but high in fat.

The patients unable to eat orally were given the second diet shown in Table II, which was given by tube feeding by blending all food items after cooking. This diet also provided almost same amount of calorie, carbohydrate, protein and fat as the first diet.

Out of 12 patients admitted in the ICU within 2 days 33.3% (4) were died, while one improved upon given the COPD diet along with specific treatment (Table III). As the days of diet consumption increased the rate of improvement also increased and as such after 3 & more days out of the rest 7 patients 85.7% improved in their condition, while only one died indicating remarkable effectiveness of the COPD diets.

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Table I

Nutrient contents of the COPD diet – 1

Diet composition		Carbohydrate (g)	Protein (g)	Fat (g)	Calorie (g)
Breakfast	Roti – 2pc. (60g)	31.37	4.96	0.64	151
	Egg-1pc. (boiled)	-	7.66	8.79	110
	Vegetable-50g (papaya)	1.66	0.26	0.07	9
Snacks	Fruits (apple) 40g	5.36	0.10	0.20	24
	Egg-1pc	-	7.66	8.79	110
Lunch	Rice-90g, 1 cup	24.78	2.49	0.09	110
	Fish (Rhou) 90g	7.74	13.41	1.14	96
	Dal (lentil) 5g	3.59	0.91	0.14	19
	Veg. (mixed) 100g	3.00	1.28	0.04	14
Snack	Milk 120ml, 1 cup	5.86	3.98	4.8	83
Dinner	Rice-1 cup (90g)	24.78	2.49	0.09	110
	Chicken 70g	-	21.28	3.83	119
	Veg. (mixed) 100g	3.59	0.91	0.14	19
	Oil for cooking 70g	-	-	70.0	630
	Total	111.73	67.39	98.76	1604
	% of calorie	28%	17%	55%	100%

Table II

Nutrient contents of the COPD diet – 2

Food items	Carbohydrate (g)	Protein (g)	Fat (g)	Calorie (g)
Egg-2pc	-	15.32	17.58	220
Vegetable-200g	7.18	1.82	0.08	37
Fruits (banana) 100g	27.91	1.20	0.30	119
Fish (Rhou) 100g	9.47	16.39	1.39	116
Dal (lentil) 30g	18.06	7.67	0.22	105
Milk 250ml,	11.0	8.00	10.25	168
Rice-50g	38.54	3.87	0.14	171
Chicken 60g	-	12.94	1.43	65
Oil for cooking 70g	-	-	67.0	603
Total	112.16	67.21	98.39	1604
% of calorie	28%	17%	55%	100%

Table III

Improvement of the condition of the patients after consuming COPD diets at ICU

Duration of stay at ICU	No. of patients	Condition improved & released		Condition deteriorated & died		Total
		No.	%	No.	%	
Upto 2 days	5	1	20.0	4	80.0	100.0
≥ 3 days	7	6	85.7	1	14.3	100.0
Total	12	7	58.3	5	41.7	100.0

Discussion

Food is required as a fuel for meeting energy requirement and to maintain body processes that sustain life. Energy is required for maintaining the physicochemical environment of the life[2]. Patients with COPD clearly have a distinct pattern of energy metabolism and fuel oxidation. The higher resting energy expenditure in COPD is associated with a significantly higher oxidation of carbohydrate, irrespective of the quality of diet. This increased oxidation may relate to a decrease in respiratory efficiency and an increase in the work of breathing, in turn resulting in the use of glucose as the primary fuel for respiratory muscle function[1]. On the other hand if carbohydrate content of the diet is lowered with corresponding increase in fat then the higher production of CO_2 can be halted respiratory distress in COPD subjects. This study indicated that low carbohydrate and high fat diets were effective in improving the condition of the COPD patients. Also the rate of respiratory difficulty decreased with the duration of diet consumption. A study with low carbohydrate diet consisted of 28% CHO calorie and 55% fat calories and resulted in significantly lower production of carbon dioxide, indicated that those with marginal ventilatory reserve might benefit from a dietary regimen in which a high percentage of calories we supplied by fat, which also supports the finding of the present study[6]. It may be concluded that the diets given to the COPD patients were effective. So, it is recommended that these diets are suitable for COPD patients, whatever the case may be, and should be given for at least 3 days and also to be continued for better improvement.

References

1. Ivone M. Ferreira, Dina Brooks, Yves Lacasse and Roger S. Goldttein.,: Nutritional Intervention in COPD. Chest 119(2): 335.
2. Ekhard E. Ziegler, L.J. Filer, Jr., Present Knowledge in Nutrition, Seventh edition. Washington, DC. 1996; Page 33 – 41.
3. Energy and protein requirements. Report of a joint FAO/WHO/UNO Expert Consultation. Technical Report series 724, World Health Organization, Geneva, 1985.
4. Gopalan C. et al.: Nutritive value of Indian foods. National Institute of Nutrition. Indian council of Medical Research, 1993; Hydrabad. India.
5. Ali S.M.K., Malik M.A., Jahan K., Salamatulla Q.,: Deshiya khadha drabber pustiman. 1992; University of Dhaka, Bangladesh.
6. Angelillo VA, et al. Effect of low and high carbohydrate feeding in ambulatory patients with chronic obstructive pulmonary disease and chronic hypercapnia. Ann Intern Med. 1985 Dec; 103(6(pt 1) : 883–5.

Chest & Heart Journal
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Diagnostic Role of Tuberculin Test in Pulmonary Tuberculosis and its Clinical Correlations

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Abstract:

Background: Nearly one-third of the global population about 2 billion people are infected with Mycobacterium tuberculosis and at risk of developing the disease. In our country 1,50,000 (.15 million) new cases of TB emerge and 80,000 (.08 million) die of tuberculosis every year. To combat such an alarming situation their is no alternative of early diagnosis and competent treatment. Finding AFB in sputum is the definitive tool for diagnosing pulmonary TB. Sputum examination has sensitivity of 50% and specificity of greater than 99%. 50% of the cavitating diseases and 32% of the non-cavitating diseases show acid-fast bacillus in the sputum. Culture of AFB requires 6-8 weeks time. Role of sero diagnosis is very narrow. So role of tuberculin test as a diagnostic tool was evaluated in the study. Some gives much reliance on it. Some does not rely on it at all. So a clear correlation of this test with tuberculous infection recent or past, with or without disease was needed to be found out.

Materials and Method: A prospective case control study was carried out in the National Institute of Diseases of the Chest and Hospital, Mohakhali, Dhaka during the period from January 1999 to December 2000. Tuberculin test (Mantoux test) was performed by span's tuberculin PPD (Calibrated against batch RT-23) in 212 subjects. Out of them 110 were cases who were excreting AFB in their sputum and fulfilling the inclusion and exclusion criteria. 102 were healthy controls whose sputum were free of AFB and fulfilling the inclusion and exclusion criteria.

Results: Consolidation, patchy opacity, cavitary lesion and fibrosis were the prominent radiological type of lesion. AFB excretion status were 1+, 2+ and 3+. Most of the 2+ and 3+ AFB excretors belong to the patients having cavitary lesion in x-ray. In the severity scale most of the cases radiologically had moderately advanced lesion. The more severe the lesion the less is the size of MT readings. Patients with minimal lesion in x-ray responded with larger size of induration (> 20mm size). The cause of the negative results were evaluated. In the present study, the sensitivity of the Mantoux test was 84.54% and the specificity was 74.50%. Positive predictive value was 78.15% and negative predictive value was 81.72%.

Conclusion: Tuberculin test is an easy and sensitive test. Doubtful results should be evaluated by PPDs. from atypical mycobacterium. Scope for anergy testing should be ensured.

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Introduction:

It is estimated that 2 billion persons-one third of the global population are infected with mammalian tubercle bacilli. Annually, on a worldwide basis, 20 million prevalent active cases occur, including 8 million new cases. This disease is the leading infectious cause of death in the world, with approximately 3 million people worldwide dying yearly of tuberculosis[1]. It was estimated in 1994 that 5.5 million people worldwide are co-infected with the tubercle bacillus and human immunodeficiency virus (HIV). It is projected that global rates of tuberculosis will rise in the decade ahead, particularly in Sub-Saharan Africa and perhaps most seriously in Southeast Asia[1]. M. Tuberculosis kills more people than any other single infectious agent. Death from TB comprise 25% of all avoidable death in developing countries. Ninety five percent of TB cases and 98% of TB death are in developing countries. Seventy five percent of TB cases in developing countries are in the economically productive age group (15 -50 years)[2] In Bangladesh with a total population of 140 million, 5 out of every 1000 persons suffer from tuberculosis with 150000 new cases every year[3]. It is a great task for us to get rid of this enormous problem. For elimination of these cases an effective antitubercular chemotherapy is urgently required. But before this a correct diagnosis is needed. For diagnosis of pulmonary tuberculosis history, clinical examination and Sputum smear examination for acid-fast bacillus, Sputum culture for TB bacillus, X-ray chest P/A view, Tuberculin test and others e.g. serodiagnosis by Elisa Method, etc. are done. Although identification of the mycobacterium tuberculosis in the sputum of a patient is the definitive tool for diagnosis of pulmonary tuberculosis but in the most cases the organism is not found in the sputum.

Sputum smear examination is usually positive in advanced diseases but may be negative in less advanced diseases. Sputum smear examination had a sensitivity of about 50% and a specificity of greater than 99% seen in different studies. In one study smears were positive in 52% of patients with cavitating diseases but in only 32% with non cavitating diseases[4]. Isolation of organism by culture is very much difficult because it takes 6-8 weeks time and should be done in specialized laboratory by the guidance of an expert personnel[5]. Applicability of sero diagnosis in Tuberculosis is very narrow. So, role of Tuberculin test as a diagnostic tool was evaluated in the study. Radiological changes are found at the time of tuberculin conversion in 7-30% of young adult, being higher in those exposed to a known source of infection. It is seldom possible to make a completely confident diagnosis of pulmonary tuberculosis on radiological grounds alone, as almost all the manifestations of tuberculosis can be mimicked by other diseases. Tuberculin test poses a diagnostic dilemma. Some over diagnose tuberculosis cases by this and treat them unnecessarily. Some under-diagnose TB. cases by this test. So finding out a clear correlation of this test with tuberculous infection, recent or past, with or without disease were very much needed.

Materials and Methods:

It was a prospective case control study. The study was conducted during the period from January1999 to December, 2000 in the Department of Respiratory Medicine, National Institute of Diseases of the chest and Hospital (NIDCH), Mohakhali, Dhaka for determining the diagnostic role of Tuberculin test (Mantoux test) in Pulmonary tuberculosis and to find out its clinical correlation.212 subjects were studied. Out of them, 110 were cases (here in after referred to as group A) and 102 healthy attendants of different patients were controls (here in after referred to as group B). Consecutive members of the cases and controls were selected for the study. Primarily 114 cases were selected and MT was done. 2 patients died in the ward, one due to profuse haemoptysis and one due to myocardial infarction. 2 patients left hospital before readings. 104 were selected as controls. 2 persons left hospital and did not come back for MT result. So, ultimately 110 were cases and 102 were controls.

Criteria of Inclusion : Patient of all ages and either sex who were bacteriologically sputum positive confirmed by sputum smear examination for AFB in 3 (three) consecutive samples with either or all of the following features-1) Clinical features of pulmonary tuberculosis e.g. Fever, Cough, Night sweat, Haemoptysis, weight loss arid chest pain etc. 2) Radiological features of pulmonary tuberculosis, e.g. Patchy opacity, Cavitary lesion, Consolidation, Fibrosis, etc. Control group was

selected from attendants of different patients attending NIDCH, of all ages and either sex who had neither clinical symptoms nor radiological evidence consistent with pulmonary tuberculosis and who were also sputum negative in 3 (three) consecutive sputum samples.

Criteria of Exclusion: 1) Very old and moribund patients who were confined to bed and could not rise from bed to give their measurement of height and weight were excluded from the study. 2) Known MDR TB patients. 3) Non cooperative subjects. 4) Attendants of TB patients were excluded.

Performing Tuberculin test: All the samples both cases and controls were evaluated by Tuberculin test. Here Mantoux test was done as a standard procedure. 10 TU. of SPAN'S tuberculin PPD calibrated against PPD RT-23 in 0.1 ml were injected intradermally into the volar surface of the forearm. Readings were taken in mm of indurtion after 72 hours.

Induration was only considered while interpreting the test. Erythema was disregarded. Reactions are classified as follows:

Positive : Induration measuring 10 mm or more.

Doubtful: Induration measuring between 5 and 9 mm.

Negative: Induration measuring less than 5 mm.

In the control group, for aged patients showing induration measuring between 5 and 9 mm were retested after one week with the same dose of tuberculin to see the booster phenomena. Some Important Variables :

A. AFB execration status: WHO-Categorised AFB excretion status as follows[6] : Number of bacilli 10-99/100 immersion field-1+, 1-10/immersion field - 2+, 10>/ immersion field - 3+, B. Radiological classification of disease extent: For clinical and research purpose National Tuberculosis Association of USA has classified radiological lesion as follows[7]

1. Minimal lesion - Minimal lesion include those that are of slight to moderate density but which do not contain demonstrable cavitation. They may involve a small part of one or both lungs, but the total extent, regardless of distribution, should not exceed the volume of lung on one side that occupies space above the second chondrosternal junction and the spine of the fourth or the body of the fifth thoracic vertebra.
2. Moderately advanced lesion- Moderately advanced lesion may present in one or both lungs, but the total extent should not exceed the following limits: (a) disseminated lesions of slight to moderate density that may extend throughout the total volume of one lung or the equivalent in both lungs (b) dense and confluent lesions limited in extent to one third the volume of one lung; (c) total diameter of cavitation, if present, must be less than 4cm.
3) Far advanced lesion-Lesions more extensive than moderately advanced.

Figure-I shows grooss distribution of tuberculin reaction in studied population. MT readings were divied into 3 categories-0-4 mm, 5-9mm and $\geq$ 10 mm. In group A 11 (10%) showed reaction in 0-4 mm range, on the other hand in group B, 69 (67%) showed reaction in the same category. 6 (5.45%) subjects of group A and 7 (6.86%) subject of group B showed induration of 5-9mm size.93 (84.54%) patients of group A and 26 (25.49%) subjects of group B showed the reaction in greater than 10 mm range.

Table-I: Shows distribution of AFB excretion status according to the type of lesion in x-ray. AFB excretion status in sputum in respect of type of lesion in x-ray chest were analysed. Depending upon the number of AFB identified by microscopy in the sputum- smear; sputum AFB report was categorized as 1+, 2+, 3+, as recommended by WHO. Type of lesions in x-ray were consolidation, cavitary lesion, patchy opacity and fibrosis. These were identified according to predominance. Out of 110 patients in group A, 9(8.18%) had consolidation, 67(60.90%)showed cavitary lesion, 31(28.18) showed patchy opacities and 3(2.72%) showed fibrosis in chest x-ray P/A view. Highest number of patients, 67 (60.90%) had cavitary lesion and least number of patients 3, (2.72%) had fibrosis in chest x-ray. Out of 110 patients, 14(12.72%) had 1+ AFB in their sputum. Of these 14 patients 6 (42.85%) had consolidation, 3(21.92%) had cavitary lesion, 3(21.42%) had patchy opacity and 2 (14.28%) had fibrotic lesion. 53 (48.18) of 110 patients had 2+

AFB in the sputum. Of these 53 patients, 35.66%) had consolidation, 31 (58.49%) had cavitary lesion, 18(33.96%) had patchy opacity, 1(1.88%) had fibrotic lesion in chest x-ray. 43 (39.90%) of 110 had 3+ AFB in their sputum. Among them, 33(76.74%) had cavitary lesion and 10(23.25%) had patchy opacity but consolidation and fibrotic lesion were not found in any patient.

Table –II: Shows MT readings in the cases according to severity of lesion in chest x-ray.

Out of 110 patients, 36 (32.7%) had minimal lesion, 69(62.7%) had moderately advanced lesion and only 5(4.5%) had far advanced lesion. Out of 36 patients who had minimal lesion in chest x-ray, none showed reaction in 0-4mm range, 4(11.1%) showed reaction in 5-9mm range, 2(5.55%) showed reaction in 10-20mm range and 30(83.33%) showed induration sizes of >20mm range. Out of 69 patients who had moderately advanced lesion, 7(10.14%) showed induration sizes of 0-4mm range, 2(2.89%) showed reaction sizes of 5-9mm range, 58(84.05%) showed MT readings in 10-20mm range and 2(2.89%) patients had reaction greater than 20mm range. Out of 5 patients who had far advanced lesion in x-ray chest, 4(80%) patients had induration of 0-4mm range, mostly these were zero and 1(20%) showed reaction in 10-20mm range. None reacted in 5-9mm and >20mm range.0-4mm range reactions mostly belonged to patients of moderately advanced and far advanced lesion in chest x-ray. 10-20mm range reactions mostly belonged to patients of moderately advanced lesion and >20mm up to 32mm reactions mostly belonged to patients of minimal lesion in chest x-ray. Table -III shows Sensitivity and specificity of Tuberculin skin test in the present study. Mantoux test readings of 10mm and above were considered positive and less than 10mm were considered negative. In cases (group A), out of 110, 93 (84.54%) showed positive reactions, 17 (15.45%) showed negative reactions. In controls (group B), out of 102 subjects, 26 (25.49%) showed positive reactions and 76 (74.50%) showed negative reactions. Sensitivity was 84.54%, specificity was 74.50%, positive predictive value was 78.15%, negative predictive value was 81.72%.

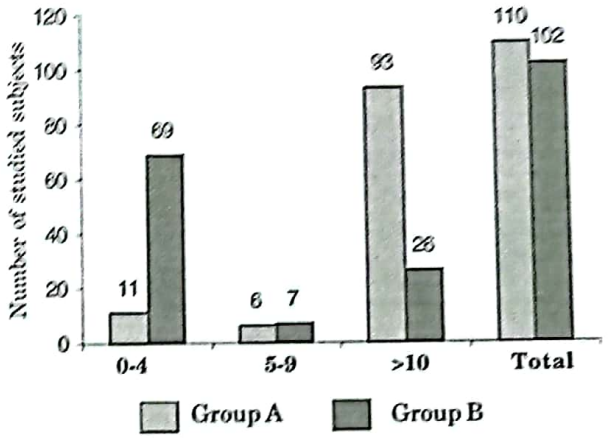

Fig.-1 : *Bar diagram showing gross distribution of tuberculin reaction in the studied population*

Table-I

Distribution of AFB excretion status in the sputum according to the Type of lesion in x-ray chest P/A view.

AFB excretion Status in sputum	Total cases (n=110)								Total	%
	Consolidation		Cavitary lesion		Patchy opacity		Fibrosis			
	No	%	No	%	No	%	No	%		
1+	6	42.85	3	21.42	3	21.42	2	14.28	14	12.72
2+	3	5.66	31	58.49	18	33.96	1	1.88	53	48.18
3+	0	.0	33	76.74	10	23.25	0	.0	43	39.9
Total	9	8.18	67	60.90	31	28.18	3	2.27	110	100

Table-II

Distribution of the MT reading in cases (Group A) according to the severity of lesion in X-ray chest: Severity of lesion in X-ray chest P/A view in Group A (n=110)

Mantoux Test(MT) in mm	Minimal lesion		Moderately advanced lesion		Far advanced lesion		Total	
	No	%	No	%	No	%	No	%
0-4	0	0	7	10.14	4	80	11	10
5-9	4	11.11	2	2.89	0	0	6	5.45
10-20	2	5.55	58	84.05	1	20	61	55.45
>20	30	83.33	2	2.89	0	0	32	29.09
Total	36	100	69	100	5	100	110	100

Table-III

The sensitivity and specificity of the tuberculin skin test (Mantoux Test) in the studied population. Total no. of studied subjects(n=212)

Mantoux test Status	Group-A (n-110)		Group-B (n-102)		Sensitivity	Specificity	Positive predictive Value	Negative predictive Value
	No.	%	No.	%	No.	%	No.	%
Positive	93	84.54	26	25.49	84.54%	74.50%	78.15%	81.72%
Negative	17	15.45	76	74.50				
Total	110	100	102	100				

Chi Square=79.66, df=2, P value is <0.0001

Discussions

In the present study type of pulmonary lesions in the x-ray chest were analysed, out of 110 patients 9(8.18%) had consolidation, 67.(60.90%) had cavitary lesion, 31(28.18%) had patchy opacities and 3(2.72%) had fibrotic changes in x-ray. Highest number of patients 67(60.90%) showed cavitary lesion in chest x-ray. Ragman et al. showed in their study cavitary lesion in 96 (96%) which topped the list, and much higher than the present study, others are consistent. May be that they have included the patchy opacities with the cavitary lesion, as they did not mention this separately. In the present study, out of 110 patients in group A, number of patients showing minimal lesion in x-ray chest were 36(32.7%), moderately advanced lesion were 69(62.7%) and far advanced lesion were 5(4.5%). Most of the lesions were moderately advanced. Although it is not almost similar with the findings of Rajasekaran et al. and William et al., their findings had an upward trend[8,9]. In the present study out of 110 patients in group A, in total 17(15.45%) not responded to tuberculin test, i.e. they are tuberculin negative. William et al. showed the similar number of non responder. In their study non responder was 14.70%. In the present study, out of the non responder 17 patients, 4(23.52%) had minimal lesion, 9(52.91%) had moderately advanced lesion and 4(23.52%) had far-advanced lesion. And out of 36 patients of minimal lesson, 32 (88.88%) responded and out of 69 patients of moderately advanced lesion, 60(86.95%) responded which is almost similar with the findings of William et. al. . In his series 90.90% patients of moderately advanced lesion responded and 90.90% patients of minimal lesion responded. But response of far advanced lesion differs between their study and our study. In their study 75% of patients of far advanced lesion responded but ours only 20%, may be that in their cases general condition and nutritional status of patients were better even the patients had far advanced lesion in x-ray. Raj

asekaran et. al. in their series found 24% of patients with minimal lesion, 50% of patients with moderately advanced lesion and 61 % of Patients with far advanced lesion were non responders in bacteriological confirmed cases. In our series non responder with far advanced lesion were 80%. And 13.03% and 11.11% are non responder with moderately advanced and minimal lesion respectively, which are 50% for moderately advanced lesion and 24% for minimal lesion in the series of rajasekearan et al. The reason of difference may be that they included frank cases without any treatment previously but in our cases some of the patients got treatment from before hand which improved the immunity. AFB excretion status was defined by WHO as 1+, 2+, and 3+. In the study, it was seen that 43 had 3+ AFB in sputum. Out of these 43,33 (76.74%) patients had cavitary lesion in chest x-ray. 1+ and 2+ AFB excretors were seen in all the radiological lesion groups. But 3+ AFB excretors seen mostly in patients with cavitary lesions in chest x-ray. To find acid fast bacillus per field on the average would require 10^6 bacillus per milliliter of sputum. Most types of pulmonary tuberculosis involve only 10^2 to 10^4 bacillus, whereas pulmonary cavities contain about 10^7 to 10^9 bacillus[10].

In the present study, Out of 110 patients only 11 (10%) showed MT readings in 0-4 mm range. Most of the readings were '0',only one was 4. Among them malnutrition (BMI<16) was 2 (18.18%), cirrhosis of liver with hepatic failure was 1(9.09%). Uncontrolled diabetes mellitus was 1(9.09%), Steven's Johnson Syndrome was 1(9.09%) and no cause was revealed in 6(54.54%) cases. These conditions can cause false-negative results by some sorts of immune suppression. It can be due to generalize anergy or specific anergy. But it was not evaluated by anergy testing. Neither the CDC nor the American Thoracic Society (ATS) currently advocates anergy testing. It is not considered a sensitive test of immune function and increases confusion regarding interpretation of the PPD test[11].Overwhelming tuberculous infection caused immune suppression and tuberculin test result become false negative[12]. Sensitivity in our study was 84.54%, specificity was 74.50%, positive predictive value was 78.15%, negative predictive value was 81.72%. MC Murray and Echeverri showed 80% sensitivity[13], Holdern et al. showed 83% sensitivity[14], William et al. in their study showed 85.29% sensitivity. The results of all of the studies are very much consistent with result of the present study. Specificity varies depending on the existence of atypical mycobacterium in the environment So, specificity varies in different geographical areas.

Non specific sensitivity ranged from less than 10% in Denmark and Northern USA to over 90% in the Philippines, Sudan and Vietnam. In our present study, in group A, out of 110, 6 (5.45%) showed tuberculin reaction in the range of 5 - 9mm, these may be due to reduced immunity from any cause or may be due to infection by atypical mycobacterium. Siddique et al. in their study showed, out of 100 sputum smear positive pulmonary tuberculosis cases, 9 (9%) were atypical mycobacterium confirmed by biochemical test on organism grown in lowenstein-Jensen media[15]. In group B, 26 (25.49%) patient showed tuberculin reaction size > 10mm. These are due to infection by M. tuberculosis. The great majority of primary tuberculous infections are probably symptom less, at least in young adults and adolescents[16]. In most cases there are no detectable physical signs.

7(6.86%) showed induration of 5-9 mm size. These might be due to waning immunity in 3(2.94%) elderly patients. But they showed no boosting effect after giving same dose of Tuberculin one week later. 4 (3.42%) were young adult, who were not given booster dose. Another possibility was asymptomatic infection by atypical mycobactera. Seduce et al. showed 9% of pulmonary tuberculosis Siddique were due to atypical mycobacterium. Nontuberculous mycobacterium include a wide range of bacterial species. Many are harmless. They are common in the environments of many high prevalence countries but they seldom cause disease. However, harmless infection in humans can give rise to a weakly positive tuberculin skin test[17].

Conclusion:

It is a cheaper and sensitive test. Doubtful results-should be evaluated by further test using PPDs. from atypical mycobacteria. Further study is essential to see the sensitivity and specificity in greater number of subjects in multiple centers. Scope for anergy testing should be widened.

References:

1. Mc Donald RJ, Reichman LB.- Tuberculosis: Text book of pulmonary Diseases, 6th edition, edited by GL. Baum, J.D Crap, BR Celli and JB K arlinsky. Lippin Cott-Raven Publishers, Philadelphia, 1998. 603-638.
2. WHO- Treatment of Tuberculosis: Guidelines for national Programmes 2nd ed; 1997,13-15.
3. Rahman MS., Ahmad N., Haque N.- Some clinico-Pathological findings in 100 cases of sputum Positive Pulmonary Tuberculosis, Bangladesh Medical Review Vol. XVIII, No-2 July-Dec'92.
4. Leitch A.G.- Tuberculosis: Pathogenesis, Epidemiology and Prevention , chapter- 16, 17, Crofton and Douglas's Respiratory Diseases. Edited by anthony Seaton, Douglas seaton, The Late A. Gordon Leitch; Fifth edition vol-1. 2000; 476-524.
5. Toman K.- Tuberculosis case finding and chemotherapy. WHO, 1st edi., 1989; 40-80.
6. Technical guide for sputum examination for Tuberculosis and skin smear examination for leprosy by direct microscopy. 2nd edition, 1995, Tuberculosis and Leprosy control services, DGHS.
7. National Tuberculosis Association of USA- Diagnostic standards and classification of Tuberculosis, New York: National Tuberculosis Association. 1961.
8. Rajasekaran S., Paramasivan R., Sujatha kumari, Palanisami S., Parthasarathy RT.- Sensitivity of Tuberculin test, Lung India, 1991; ix ,4 :130-31.
9. William W.J., Saltzman HS., Bufkin J.H. and Smith DT.- The tuberculin test and the diagnosis of clinical tuberculosis; Am rev Respirs Dit 1960; 81: 189-95.
10. Grosse J.- Bacteriologic basis of short course chemotherapy for tuberculosis. Clin chest Med, 1980; 1 : 231.
11. Kimerling ME. and Dunlop NE.- Tuberculosis and other mycobacterial diseases, Conn's current Therapy, edited by Robert E. Rakel, W.B. Sundar's company 1999; 239-245.
12. Hopewell P.C. and Bloom BR. Tuberculosis and other Mycrobacteral Diseases-Text book of Respiratory Medicine edited by John F. Murray, Jay A. Nadel, 2nd ed. 1994: 1094-117.
13. Mc Murray DN., Echeverri A.- Cell-mediated immunity in anergic patients with Pulmonary Tuberculosis; Am Rev. Respir Dis 1978; 118: 827-834.
14. Holden M., Dubin MR, Paul H., Diamond MD.- Frequency of Negative Intermediate Strength Tuberculin Sensitivity, The New England Journal of Medicine, 1971; 285: 1506-1509.
15. Siddique MA, Rahman M, Hosanna T., Islam Muazzem Hossain., Muzak N.- Identification of mycobacterium from Pulmonary Tuberculosis Patients. Teachers Association Journal (TAJ), 1995; 8 (2) :71-73.
16. Miller F.J. W., Seal RME., Taylor MD. et al- Tuberculosis in children, London; Churchill, 1963.
17. Crofton J., Horne N., Miller F.-Clinical tuberculosis. Macmillan Education Ltd. London, 1992: 7-8.

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"Bridge-Type" of Papillary Muscle, A New Morphological Variety

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Abstract:

Traditionally, the left ventricular papillary muscles are described as three gross morphological types in the textbooks and literature that are i) finger type, ii) completely tethered and iii) intermediate type.

A cross-sectional postmortem observational study was done on the unfixed hearts of 37 Bangladeshi males aged 20 years or more (20-70 years), with a view to noting the gross morphology of the papillary muscles. The subjects were victims of accidental, homicidal or suicidal death, nothing being known of their status regarding cardiac or coronary disorders. Majority of the hearts (72% for anterolateral group of papillary muscle, and 62% for posteromedial group) contained finger type papillary muscle, either alone or in combination with other type. A few (5.4% for both groups) contained only the papillary muscles, which were completely tethered to the subjacent ventricular myocardium. The other type of papillary muscles having a small part of their body protruding freely from the ventricular wall, the intermediate type, were present in some (21.6% for both groups) hearts. The finger type of muscles was significantly more in both the groups than the other types. In two hearts (5.4%) the posteromedial group contained one "bridge type" along with other papillary muscles. This type of papillary muscle was not found to be reported previously in any available textbook or literature.

[Chest & Heart Journal 2004; 28(1) : 11-13]

Introduction:

Papillary muscles are the muscular component of the atrioventricular valve complex. Two groups of papillary muscles are described in the left ventricle, anterolateral and posteromedial[1]. Each group consists of either single or multiple papillary muscles.

Morphologically the papillary muscles are i) finger-type, ii) completely tethered or iii) intermediate type [2,3]. The papillary muscles, which are freely protruded in the ventricular cavity, are finger-type. Those, which are fully adherent with the ventricular wall, are tethered. The intermediate type protrudes a small part freely into the cavity, but with considerable trabecular attachments with the ventricular wall.

Artery supply of different types of papillary muscles differs from one to another[2], finger type is supplied by large penetrating intramycardial artery, which penetrates at the base of the finger type of muscles and course to the apex as central artery. This central artery occasionally has very few or no anastomotic connections with the extra papillary subendocardial arterial plexus. Tethered papillary muscles receive the segmental branches of the long penetrating intramyocardial arteries. They often show rich anastornosis among themselves as well as with extrapapillary subendocardial arterial views. The intermediate type shows a combination of vascular arrangement. The free portion is supplied by a central artery but many segmental branches pass through the trabeculated part of the muscle.

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The difference in the morphological pattern of the papillary muscles not only modify their arterial supply but also influence the chordonapillary pull on the leaflet during ventricular systole4. This in turn influences the proper alignment of the leaflets at their atrial surface. Thus the different morphological pattern of the papillary muscles has a great importance both anatomically and functionally.

A review study was done to find the different morphological pattern of left ventricular papillary muscles in the heart of adult Bangladeshi males.

Materials and Methods:

Thirty-seven apparently normal postmortem hearts were studied to find out the different morphology of the left ventricular papillary muscle in adult Bangladeshi males. The hearts were collected from unclaimed deadbodies, aged 20 years or above (20 to 70 years), autopsied on different dates from February, 1999 to May 1999 at the mortuary of the department of Forensic Medicine of Dhaka Medical College (DMC), Dhaka. Most of the cases were accidental and rests were homicidal or suicidal. None died of any known cardiac cause. The hearts were collected within 24 hours from the death.

The hearts were removed from the deadbodies with a great care and thoroughly washed with normal saline. A cut was made along the left part of the atrioventricular sulcus to separate the left atrial wall from the mitral annular ring. The ring was then excised carefully from the ventricular myocardium and root of the aorta. The left ventricular cavity was then opened by dissecting its left border from base to apex. The incision passed in front of the anterolateral papillary muscles. The number of the papillary muscles and the sites of their basal attachments with the ventricular wall were noted. The extension of their attachment with the ventricular wall and the free portion of the papillary muscles were also observed.

Results:

Majority of the papillary muscles were protruded freely like a finger into the ventricular cavity after arising from its wall. Few papillary muscles were found almost fully adherent to the subjacent ventricular myocardium and these were tethered papillary muscles. Some intermediate type of papillary muscles with a small part of their bodies protruding freely into the ventricular cavity and having a considerable number of trabecular attachments with the ventricular wall were also there (Table-0. In some hearts either the posteromedial group or the anterolateral group, or both were found consisting of different types papillary muscles (combined type), among which again the finger-tvpe was predominating. Thus among the anterolateral group, the finger-type of papillary muscles were present in more than 72% of hearts, similarly among the posteromedial group they were present in about 62% of hearts.

In two hearts a new type of papillary muscle was found in the posteromedial group (in combination with other type). Both ends of these papillary muscles were fixed to the ventricular wall and the middle shaft was free. The lower end was attached to the middle third of ventricular wall and the upper end to the upper third. The chordae tendineae arose from the free shaft but the chordal attachments to the leaflets were similar to that in others (Fig. 1).

Table-I

Privilege of different types of papillary muscle in the normal heart (n = 37)

Group of papillary muscle	Number of the hearts containing			
	Finger type	Intermediate type	Tethered type	Combination of more than one type
Anterolateral	23 (62.16%)	8 (21.62%)	2(5.4%)	4(10.81%)
Posteromedial	11 (29.73%)	8(21.62%)	2(5.4%)	16 (43,24%*)

*'Bridge type' papillary muscles were found in two hearts of this group.

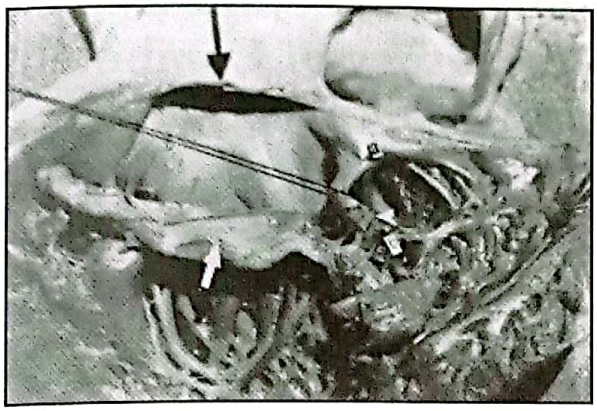

Fig. 1 : *Interior of the left ventricle showing a"bridge type" papillary muscle (lifted by thread) in posteromedial group. The two ends (a, b) of the muscle are fixed with the ventricular wall. The chordae (arrowhead) arise from the free shaft. The anterior leaflet has been excised at its base (white arrow) from the root of aorta (black arrow) to have a good view of the papillary muscle.*

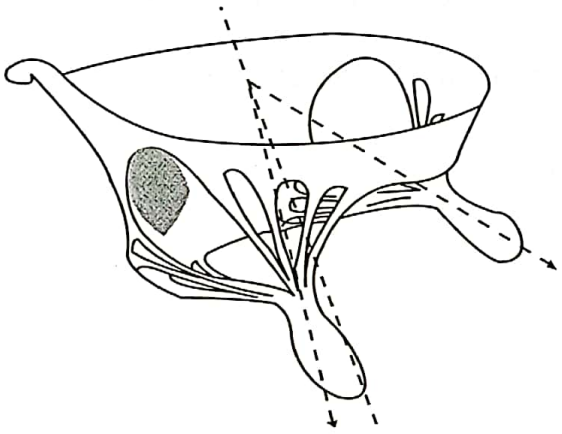

Fig.-2 : *Diagrammatic picture of open mitral valve to show the papillary muscle pulls. The axes of pull are directed Upward toward the centre of annular orifice (from Davila and Palmer 1962)*[5].

Discussion:

Ranganathan and Rurch[2] described the papillary muscles in three categories depending on the nature of attachment to the ventricular wall and the relative length of the body of the muscle that protrudes freely into the ventricular cavity. These are i) finger-type, ii) completely tethered, and iii) intermediate type of papillary muscles. Their mode of arterial supply also differs from one type to another.

In the present study two hearts contained a new type of papillary muscle (one in each heart) both ends of which were attached to the ventricular myocardium. The chordae arose from the free middle part of that papillary muscle. This type of papillary muscle, which may be named as the "bridge-type", was not found to be reported in any available textbook or literature. The most common variety of papillary muscles observed in this study was finger-type, and the intermediate type followed it.

Davila and Palmer[5] mentioned that papillary muscles are usually aligned on an axis, which points upward toward the centre of the annular orifice. This position permits the contracting papillary muscles to exert a desirable chordopapillary "vertical force", which might help the leaflets for proper alignment on their atrial surface and restraining them from eversion toward the atrium (Fig. 2). The morphometric variations of papillary muscles as well as its site of attachment to the ventricular wall may have a great influence to the chordopapillary pull during ventricular systole. This, in turn, influences the proper alignment of the leaflets at their atrial surface. There might be a field of study to find out the nature of the chordopapillary pull of the bridge-type of papillary muscles on the leaflets during ventricular systole.

References:

1. Chiechi MA, Lees WM, Thompson R. Functional anatomy of the normal mitral valve. J Thoracic Surg 1956; 32 : 378-98.
2. Ranagnathan N. Burch GE. Gross morphology and arterial supply of the papillary muscles of man. Am Heart J 1969; 77(4) : 506-16.
3. Williams PS, Warwick R, Dyson M, Bannister HL, editors. Gray's anatomy. 37th ed. Edinburgh: Churchill Livingstone; 19R9
4. Davachi F. Moller JH. Edwards JE. Diseases of the mitral valve in infancy. Circulation 1971; 43 : 565-79.
5. Davila , JC, Calmer TE. The mitral valve. Arch of Sura 1962; 84 : 174-98.

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Analysis of 303 Cases of Ventricular Septal Defect in Non-invasive Cardiac Laboratory of Combined Military Hospital Dhaka

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Summary

Ventricular Septal Defect (VSD) is the commonest single type (30%) of congenital heart disease. Echocardiography (two dimensional and doppler) is a very sensitive investigation for anatomical diagnosis of VSD and also to get haemodynamic information. From the year 2000 to 2002, 303 cases of isolated VSD were enrolled in the registrar of Non Invasive Cardiac laboratory (NIC lab) of Combined Military Hospital (CMH) Dhaka and they were analyzed retrospectively. Majority (100) of patient with small VSD and all with Eisenmenger syndrome (4) were managed medically. Fifty (16.50%) patients with large VSD, ten (3.30%) patients with moderate VSD and one (0.33%) patient with small VSD were managed surgically. Two hundreds and two (60.6%) patients were under follow up getting medical management. From this group thirty nine (12.87%) patients may need surgery in future if medical management failed. Twenty nine cases had spontaneous closure of VSD, many of them had small VSD (20) and few of them had moderate (8) and large VSD (1). Eleven (3.63%) patients died from pneumonia, arrhythmia and post surgical complications.

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Introduction

The term Ventricular Septal Defect describes an opening in the ventricular septum. Sixteen percent of patients seen with heart disease at children's Hospital in Boston in recent years have had ventricular septal defects as defined above[1]. Two dimensional (2-D) and Doppler Echocardiographic methods have become the non invasive methods of choice for the evaluation of a patient with Ventricular Septal Defect (VSD). 2-D Echocardiography permits visualization of moderate to large defect whereas Doppler echocardiography permits diagnosis of the location of a small VSD by determining the site of turbulent flow[2-8]. Noninvasive measurement of pulmonary artery pressure and measurement of size of the shunt is also possible by Doppler Echocardiography. In this study, 303 cases of VSD were analyzed retrospectively from January 2000 to December 2002 in the Non-Invasive Cardiac Laboratory of CMH Dhaka and their clinical and echocardiographic profile and outcome were observed. The aim of the study was to get an idea about outcome of various types of VSD in Bangladesh.

Materials and Methods

This is a retrospective study carried out in the noninvasive cardiac laboratory (NIC Lab) of CMH Dhaka. Three hundred three (303) cases of isolated VSD were diagnosed from January 2000 to December 2002. Cases were enrolled consecutively in the registrar of NIC Lab. The patients who had VSD along with other major associations like Tetrology of Fallot (TOF), Pulmonary Atresia (PA), Truncus Arteriosus, Pulmonary Stenosis etc were excluded. These patients were referred for Echocardiography by paediatricians and cardiologists. The work up and clinical examination of the patients were done. The Chest X-ray and 12 leads

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ECG was the prerequisite for enrollment in the registrar of NIC Lab. Then comprehensive two dimensional and Doppler echocardiographic examinations were performed. The presence or absence of VSD was established by comprehensive scans of entire septum from multiple tomographic angles. VSD's were classified as (a) small (b) moderate and (c) large. Small defects impose a high resistance to flow with a resultant large pressure difference between ventricles, less left to right shunt, normal right heart pressure etc. Moderate defects are with a diameter less than or equal to half that of aortic orifice and a peak systolic pressure difference of ≥ 20 mmHg between two ventricles. Large defects are approximately the size of the aortic orifice, they are nonrestrictive[9]. Pulmonary artery pressure was calculated indirectly from right ventricular systolic pressure (RVSP) in absence of pulmonary stenosis. RVSP was calculated from tricuspid regurgitation (TR) peak systolic velocity and from the peak systolic velocity of the VSD obtained by continuous wave Doppler. From the TR, RVSP was calculated as follows[10, 11]

$RVSP = 4V^{2+} 14$

(V= peak systolic velocity of TR)

From peak systoic velocity of VSD, RVSP was calculated as follow,

$RVSP = SBP - 4V^2$

(SBP = systolic blood pressure)

(V = peak systolic velocity jet of VSD)

After diagnosis, follow up Echo and out patient appointment was given after three months. The plan was to follow them up till their final disposal. Those who had spontaneous closure of VSD were discharged. Patients with small & moderate VSD and few with large VSD cases were getting medical management, some of the moderate VSD and large VSD were waiting for surgery and those who already had surgery were still under follow up to look for any post surgical complications.

Results

Out of 303 cases of VSD, 195 (64.36%) cases were male and 108 (35.64%) cases were female. One hundred ninety four patients (64.02%) were in 0 – 2 years age group, 88 (29.04%) were in 3 – 10 years age group and 21 (6.94%) were in more than 10 years age group (table I). Most of the patients were presented with recurrent RTI (33%), 21.46% had history of failure to thrive, 1.32% had Eisenmenger syndrome, 8.91% had heart failure and 35.31% were asymptomatic. So most of the patients were asymptomatic and they had incidental findings of murmur when visited doctor for other reasons. Thirteen (4.29%) patient had down's syndrome in association with VSD. Association with other congenital abnormality was found in 2.97% cases. In chest X-ray (CXR) cardiomegaly of various degree was observed in 43.89% cases and CXR was normal in the rest. Small VSD was noticed in 33.33% cases, moderate VSD in 38.94% cases and large VSD in 27.73% cases. So moderate VSD was the commonest type. Pulmonary artery systolic pressure was normal in most of the cases (56.44%). In 17.49% it was very high. Systemic to pulmonary flow ratio (QP: QS) was <1.5 in most of the cases (41.58%). QP: QS was > 2.2 in 19.81% cases. These cases had large VSD or moderate and small VSD with big shunt. Two hundred and two (60.06%) patients were under follow up and their VSD may close spontaneously in future. Among them thirty nine (12.87%) patients may need VSD closure (operative) if medical management failed. Twenty three (7.59%) patients had VSD closure (operative) already and another 38 (12.54%) patients were waiting for surgery. Fifty of them had large VSD, ten of them had moderate VSD and one of them had small VSD. Eleven (3.63%) patients died from pneumonia, arrhythmia and post surgical complications. All of these cases had large VSD. Table II showed the details of spontaneously closed VSD cases. Twenty nine (9.57%) patients had spontaneous closure of VSD. Most of the spontaneously closed cases had small VSD and closure rate was high in first three years of life. Average follow up period was 13.77 months. Lowest age of spontaneous closure was 3.5 months and highest age was 10 years (table II). Out of these twenty nine, twenty had small VSD, eight had moderate VSD and one had large VSD.

Table: I

Patients Data and variables. n = 303

Variables		Number of patients	Percentage (%)
Sex	Male	195	64.36
	Female	108	35.64
Age	0 – 2 years	194	64.02
	3 – 10 years	88	29.04
	> 10 years	21	6.94
Symptoms	Asymptomatic	107	35.31
	Recurrent RTI	100	33
	Heart failure	27	8.91
	Failure to thrive	65	21.46
	Eisenmenger	4	1.32
Associations	Down's Syndrome	13	4.29
	Other congenital Malformations	09	2.97
Cardiomegaly	Present	133	43.89
in chest X-ray	Absent	170	56.11
Type of VSD	Small	101	33.33
	Moderate	118	38.94
	Large	84	27.73
PASP	< 25 mmHg	171	56.44
	25 – 50 mmHg	79	26.07
	> 50 mmHg	53	17.49
QP: QS	< 1.5	126	41.58
	1.5 – 2.2	117	38.61
	> 2.2	60	19.81
Out come	Follow up with medical management	202	60.06
	May need surgery in future	39	12.87
	Waiting for surgery	38	12.54
	VSD closure (operative)	23	7.59
	Spontaneous closure	29	9.57
	Death	11	3.63
Type of VSD selected for surgery		Large VSD	50 16.50
		Moderate VSD	10 3.30
		Small VSD	01 0.33
Causes of death		Pneumonia	4 1.32
	Heart failure	3	0.99
	Arrhythmia	2	0.66
	Operative complications	2	0.66

Table-II

Details of spontaneously closed VSD cases. n = 29

Case No	Age of diagnosis	VSD type	Follow up time	Age of closure
01	1 ½ years	Moderate Perimembranous (PM)	1 ½ years	03 years
02	08 years	Small PM	01 years	09 years
03	03 days	Moderate PM	18 months	18 months
04	2.5 years	Small sub pulmonary	1 ½ years	04 years
05	8 months	Moderate PM	22 months	2 ½ years
06	06 days	Multiple small muscular	07 months	07 months
07	01 years	Small PM	2 ½ years	3 ½ years
08	Neonate	Small PM	01 year	01 year
09	07 days	Moderate PM	14 months	14 months
10	02 years	Small PM	01 years	03 Years
11	01 month	Moderate PM	7 ½ months	8 ½ months
12	01 month	Small PM	05 months	06 months
13	6 months	Small PM	01 years	1 ½ years
14	01 years	Small PM	01 years	02 years
15	04 years	Small PM	01 years	05 years
16	02 years	Moderate PM	08 years	10 years
17	6 months	Large PM	02 years	2 ½ years
18	3 months	Multiple VSD (PM+Muscular small)	13 months	1 ½ years
19	04 years	Small PM	01 years	05 years
20	02 years	Small PM	06 months	2 ½ years
21	11 days	Small PM	04 months	4 ½ months
22	05 years	Tiny PM	01 years	06 years
23	20 months	Small PM	22 months	3 ½ years
24	06 months	Small PM	01 years	1 ½ years
25	01 months	Small PM	15 months	22 months
26	03 years	Tiny PM	13 months	4.1 years
27	8 months	Moderate Muscular	1 ½ years	2.2 years
28	18 days	Small PM	03 months	3 ½ months
29	01 month	Small PM, Moderate Muscular	06 months	07 months

Note:

Average follow up period 13.77 months.

Highest age of closure 10 years.

Lowest age of closure 3 and ½ months.

Discussion

Ventricular Septal Defect (VSD) is the commonest congenital heart lesion in our country. As the study population had wide variation of age ranging from two days to 18 years and most of them were not enrolled since birth, this study will not reflect the actual natural history of VSD because many small VSD's may close by first year of life [12]. Most patient with VSD are asymptomatic, because defects are too small to allow sufficient left to right shunting to cause symptoms. In this study 35.31% patients were asymptomatic and discovered incidentally when they visited pediatricians for other reasons. Larger defects usually present with feature of heart failure, growth failure etc [13,14] (table I). Older patient with large defect may present with Eisenmenger syndrome for the first time. In this study only 1.32% patient had such feature. It may be mentioned here that because of the unique haemodynamics in adult, a patient with Eisenemenger syndrome may not have right ventricular failure which is common in other adults with severe pulmonary hypertension from other causes[15]. One hundred one (33.33%) patients in his study had small VSD and they were managed medically after diagnosis. One patient with small VSD had surgery because of big shunt. One hundred eighteen (38.94%) cases of moderate VSD's were also managed medically but some of them had cardiac catheterization and surgical closure later. Only 27.73% patients had large VSD and some of them already had surgery, some were waiting for surgery and some were still getting medical management. Pulmonary artery pressure was normal in 56.44% cases. It was very high (>50 mmHg) in 17.49% cases. QP:QS was > 2.2 in 21.13% patient, they had large VSD's with elevated pulmonary artery pressure, some of them had high pulmonary vascular resistance also. They were advised for VSD closure except the 4 who already had Eisenmenger syndrome (Table I). Twenty nine (9.57%) cases had spontaneous closure of VSD (table II). One study conducted in neonates showed 73% spontaneous closure by the end of first year. Muscular defects were more likely to close spontaneously than perimembranous defect[16]. In this study perimembranous defects were maximum, because this study was not conducted in newborn only. Another study conducted in National Cardiovascular Centre, Osaka, Japan showed that the outlet ventricular septal defect closes spontaneaously only in a small percentage of patients[17]. In this study only one patient with sub pulmonary VSD had spontaneaous closure. The low number was probably for the reason that many patients were > two years old and had passed through the stage when spontaneous closure is most common[12]. Surgical closure is not indicated in patients with small VSD and normal pulmonary artery pressure[12]. Two patients (table 1) in this study died from arrhythmia. One study showed prevalence of serious arrhythmia as second highest for VSD[18]. In this study small and most of the moderate VSD's were managed medically with good result. Large defects and some of the moderate defects had surgical closure and they were doing well. With the exception of Eisenmenger syndrome, most patients had a final clinical status of excellent and good. Similar out come was noticed in 2nd natural history study of VSD[12]. Two dimensional and Doppler echocardiography measurements provide adequate information about a patient with a VSD. It is helpful to decide about the treatment modality of patient. Post surgical complication can also be evaluated nicely with echocardiography. This is a small scale study with some limitations. Large scale study should be done to find out the natural history of VSD in Bangladesh.

References

1. Donald C. Fyler. Nadas' Pediatric cardiology. Ist ed. St louis: Hanley Belfus inc; 1992: 435 – 457.
2. Daniel R. Pieroni, Rick A Nishimura, Fredrick Z. Bierman et al Second Natural History Study of congenital Heart defects, Ventricular Septal Defect: Echocardiography.Circulation 1993; 87: 1-80 – 1-88.
3. Bierman Fz, Fellows K, Williams RG. Prospective identification of ventricular septal defects in infany using subxiphoid two dimensional echocardiography.Circulation 1980; 62: 807 – 817.
4. Cheatham JP, Lafson LA, Gutgesell HP. Ventriculat septal defect in infancy: Detection with two Dimensional echocardiography. Am J cardiol 1981; 47: 85– 89

5. Capelli H, Andrade JL, Somerville J: Classification of the site of ventricular septal defect by two dimensional echocardiography. AM J cardiol 1983; 51 : 1474 – 1480

6. Sutherland GR, Godman MJ, Smallhorn JF et al. Ventricular septal defects: Two dimensional echocardiographic and Morphological correlation. Br Heart J 1982; 47 : 316 – 328

7. Soto B, Bargeron LM, Diethelm E. Ventricular septal defect. Semin Roentgenol 1985; 20 : 200 - 213

8. Magherini A, Simonetti L, Tomassini CR et al. Cross sectional echocardiography with pulsed and continuous wave Doppler in the management of ventricular septal defects. Int J cardiol 1987; 15: 317 – 328.

9. Thomas P. Graham, Howard P Gutgesell. Ventricular Septal Defects In: G.C Emmanouilides. Hugh D Allen. Thomas A. Riemen Schneider, Howerd P Gutgessel Editors. Moss and Adams Heart Disease in infants children an Adolescents. Baltimore: William and wilking; 1995. P 724 – 744.

10. Currie PJ, Seward JB, Chan K-L et al. Continuous wave Doppler determination of right ventricular pressure: A simultaneous Doppler- catheterization study in 127 patients. J Am coll cardiol 1985; 6 : 750 – 756.

11. Yock PG, Popp RL. Noninvasive estimation of right ventricular systolic pressure by Doppler ultrasound with tricuspid regurgitation. Circulation 1984; 70 : 657 – 662.

12. Langford Kidd, David J. Driscoll, Welton M Gersony et al. Second Natural History study of congenital Heart Defects. Results of treatment of patients with Ventricular Septal Defects. Circulation 1993; 87: 38 – 51.

13. Levy RJ, Rosenthal A, Miettinen OS. Determination of growth in patients with ventricular septal defect. Circulation 1978; 57: 793 – 797.

14. Yeager SB, Freed, Keane JF. Primary surgical closure of ventricular septal defect in the first year of life : Results in 128 infants. J Am coll cardiol 1984; 3 : 1269 – 1276.

15. Hopkins, William E, waggoner, Allan-D. Severe pulmonary Hypertension without right ventricular failure: the unique heart of patient with Eisenmenger syndrome. Am – J – Cardiology 2002; 89 (1): 34 – 8.

16. Lin M-H, wand N-K, Hung K-L et al. Spontaneous closure of ventricular septal defect in the first year of life. J – formos – Med – Assoc 2001 Aug; 100 (8): 539 – 42.

17. Tomith H, Arakaki Y, Yagihara – T et al. Incidence of spontaneaous closure of outlet VSD. Jpn-Circ – J 2001 May; 65 (5): 364 – 6.

18. Rober R, David J Driscoll, Welton Gersony et al Arrhythmias in patients with valvar Aortic Stenosis, Pulmonary Stenosis and Ventricular Septal Defect. Result of 24 hours ECG monitoring. Circulation 1993; 87: 1-89 – 1-101.

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Beneficial Effect of Combined Method of Cardioplegia Over Single Method in CABG Surgery

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Abstract :

Thirty patients (15 in each group) who underwent coronary artery bypass surgery for ischaemic heart diseases were studied in the Department of Cardiac Surgery, NICVD, Dhaka. Their age, sex, height, weight and body surface are were matched in both groups. Arrest of the heart were carried out with combined antegrade and retrograde cold blood cardioplegia in group A and with antegrade cold blood cardioplegia in group B.

The evaluation of myocardial enzyme release like CK MB were significantly lower in group A than group B. Our study demonstrates a significant reduction of myocardial cell damage with use of combined antegrade and retrograde cold blood cardioplegia.

Patients with combined antegrade and retrograde cold blood cardioplegia had a short awakening time and postoperative ventilation time with significant difference between the two groups. It is associated with shorter postoperative mechanical ventilation time at NICVD circumstances. So, hazards of prolonged mechanical ventilation is avoided. Both of these ensure lower workload in ICU, quick turnover of the patients, resulting in greater number of surgery at the end of the year. All these produce beneficial effect to patient's expenditure and the national economy.

[Chest & Heart Journal 2004; 28(1) : 20-24]

Introduction:

Most of the cardiac operations require arrest of the heart and interruption of coronary blood flow, thus a precise technical procedure can be performed in a quite bloodless field[1].

The preservation of the myocardium during cardiac operations continues to be a challenge for the cardiac surgeons, because the success of the operation greatly depends on the recovery of the myocardium after a period of ischaemic arrest of the heart[2].

Cardioplegic solution is used to arrest and protect the heart. In general, cardiac arrest and myocardial protection is achieved with both antegrade and retrograde cold blood cardioplegia[3].

Combinations of antegrade with retrograde blood cardioplegia reduce major morbidity more than antegrade blood cardioplegia alone, particularly when there is more uniform distribution of blood cardioplegic solution which can be achieved by coronary sinus perfusion.

The benefit of combined antegrade and retrograde infusion of blood cardioplegic solution are becoming well known in adult coronary heart operations. They provide prompt arrest, even distribution, avoiding ostial cannulation, flushing of air or debris

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from coronary arteries, allowing uninterrupted surgical procedure. So, combined antegrade and retrograde infusion of blood cardioplegic solution can safely be used in an expanding number of heart operations providing additional myocardial protection with excellent surgical outcome[4].

Materials and Methods:

This prospective case control study was performed at the Department of Cardiovascular Surgery, National Institute of Cardiovascular Diseases (NICVD), Dhaka, during the period from July 2001 to June 2002. After the patient had agreed to participate in the study and signed an informed consent form approved by our institution, randomization was done immediately before the beginning of the operation so that group allocation was blind to the patient.

Total number of patients were 30 (thirty).

- Patients having normal serum enzymes level of CK MB in the morning on the day of operation undergoing coronary artery bypass grafts.

Exclusion criteria were Emergency CABG, Redo CABG, CABG with other procedure, e.g. MVR, AVR, VSD repair, ventricular aneurysm, Patients having abnormal liver function test, renal function test, pulmonary function test preoperatively, Patients with known any other systemic diseases, such as chronic disabling disease, malignancy.

The number of patients in each group were 15.

Collected data were compiled. Chi square analysis was used to compare nonparametric data. Unpaired Student's 't' test was used to compare intergroup means. Parametric data are presented as the group mean ± the standard error. A P value equal to or less than 0.05 was considered as significant.

Results:

This prospective case control study was carried at the Department of Cardiovascular Surgery, NICVD, Dhaka, during the period from July 2001 to June 2002. Of the total 30 patients, 15 (group A) patients received antegrade plus retrograde cold blood cardioplegia and 15 (group B) patients received antegrade cold blood cardioplegia alone.

Table I

CK MB level in preoperative versus 24 hours and 72 hours postoperative patients where combined antegrade and retrograde cardioplegia were used (group A)

Sl.No.	CK MB (U/L) Pre-operative (n=15)	24 hours postoperative (n=15)	72 hours postoperative (n=15)
1	25	48	27
2	27	42	21
3	18	45	25
4	23	55	24
5	22	52	19
6	24	47	27
7	19	51	26
8	25	50	30
9	20	40	27
10	18	42	23
11	22	47	21
12	18	52	19
13	23	56	24
14	24	53	29
15	19	51	19
Mean±SE	21.80±0.76	48.73±1.26	24.07±0.94
P value[a]	Control	<0.001***	<0.05*

[a]Paired Student's 't' test

*/*** = Significant

Preoperative, 24 hours postoperative and 72 hours postoperative study of CK MB values showed mean (±SE) values as 21.80±0.76, 48.73±1.26 and 24.07±0.94 U/L, respectively. Statistically the difference at 24 hours and 72 hours from preoperative value was significant (P<0.001 and P<0.05, respectively) in group A patients.

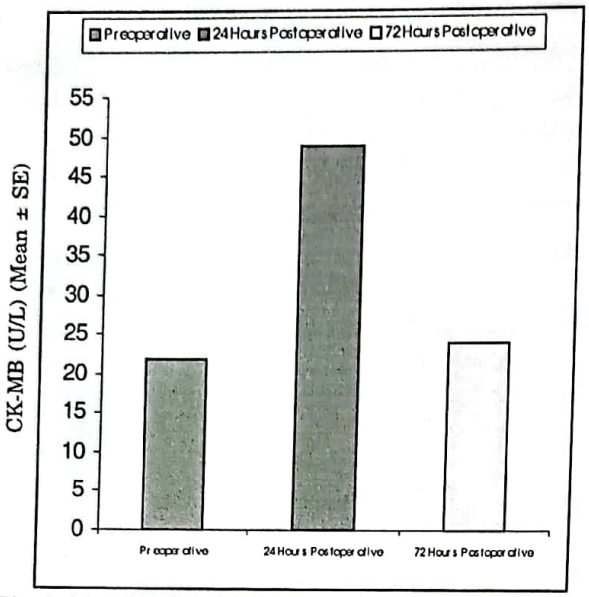

Fig. 1. *Distribution of CK-MB levels of group A patients at Preoperative, 24 hours postoperative and 72 hours postoperative periods where combined antegrade and retrograde cold blood cardioplegia was used (n = 15)*

Table II

CK MB level in preoperative versus 24 hours and 72 hours postoperative patients where antegrade cardioplegia were used (group B)

Sl.No.	CK MB (U/L) Pre operative (n=15)	24 hours post-operative (n=15)	72 hours post-postoperative (n=15)
1	18	67	30
2	23	71	29
3	22	75	28
4	21	72	27
5	18	69	26
6	19	70	25
7	24	62	26
8	23	63	27
9	25	90	28
10	20	52	56
11	19	62	26
12	23	67	30
13	18	63	28
14	19	67	31
15	24	68	29
Mean±SE	21.07±0.64	67.87±2.12	29.73±1.93
P value[a]	Control	<0.001***	<0.001***

[a]Paired Student's 't' test
*** = Significant

Preoperative, 24 hours postoperative and 72 hours postoperative study of CK MB values showed mean (±SE) values as 21.07±0.64, 67.87±2.12 and 29.73±1.93 U/L, respectively. Statistically the difference at 24 hours and 72 hours from preoperative value was significant (P<0.001 each)) in group B patients.

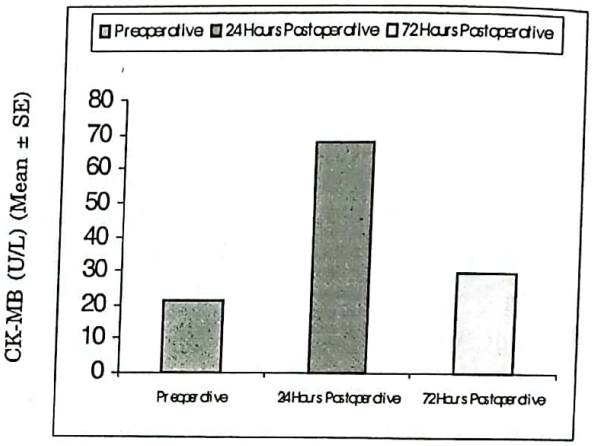

Fig. 2. *Distribution of CK-MB levels of group B patients at preoperative, 24 hours postoperative and 72 hours postoperative periods where antegrade cold blood cardioplegia was used (n=15).*

Table III

CK MB levels in preoperative, 24 hours postoperative and 72 hours postoperative in group A versus group B cases

Parameters	CK MB (U/L) Group A (Mean±SE)	Group B (Mean±SE)	P value[a]
Preoperative	21.80±0.76	21.07±0.64	0.469[NS]
24 hours postoperative	48.73±1.26	67.87±2.12	<0.001***
72 hours postoperative	24.07±0.94	29.73±1.93	<0.05*

[a]Unpaired Student's 't' test
NS = Not significant
*/*** = Significant

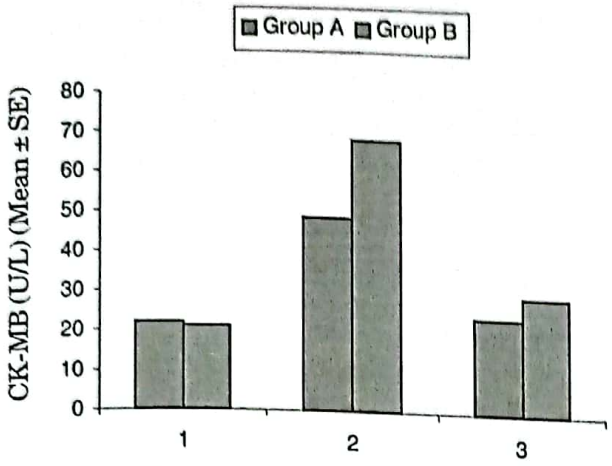

Fig. 3 : *Comparison of CK-MB levels at preoperative, 24 hours postoperative and 72 hours postoperative periods between group A (n = 15) and group B (n = 15) Patients.*

Discussion:

National Institute of Cardiovascular Diseases (NICVD) remains the leading centre in the field of cardiac surgery of this country ever since its establishment in 1981. Around 300 cases of open heart surgeries are being performed every year now a days.

The present study was conducted at NICVD from July 2001 to June 2002. The patients were grouped according to method of using cardioplegia. Group A received combined antegrade and retrograde cold blood cardioplegia. Group B received only antegrade cold blood cardioplegia. Both the groups include 30 patients through random selection. The preoperative preparation, technique of operation and postoperative care followed standard NICVD protocol in two groups. Each group included 15 patients with a total of 30 patients. Among them 27 were male and 3 were female, with a male:female ratio of 9:1. The male:female ratio in group A was 14:1, whereas that of group B was 13:2.

We studied cardiac enzyme CK MB. Their results were very significant. The CK MB level of group A versus group B are shown in Table XIII. CK MB level was significantly lower in group A than in group B.

Preoperative, 24 hours postoperative and 72 hours postoperative studies of CK MB values of group A showed mean±SE as 21.80±0.76, 48.73±1.26 and 24.07±0.94 U/L, respectively. Statistically the difference at 24 hours and 72 hours from preoperative value was significant ($P<0.001$ and $P<0.05$, respectively) in group A patients.

On the other hand, preoperative, 24 hours postoperative and 72 hours postoperative studies of CK MB values of group B showed mean±SE as 21.07±0.64, 67.87±2.12 and 29.73±1.93 U/L, respectively. Statistically the difference at 24 hours and 72 hours from preoperative value was significant ($P<0.001$ each) in group B patients.

When the CK MB values were compared between group A and group B, it showed preoperative values as 21.80±0.76 versus 21.07±0.74 U/L. The difference was statistically not significant. At 24 hours postoperative period, the values were 48.73±1.26 versus 67.87±2.12 U/L and the difference was statistically significant ($P<0.001$). At 72 hours postoperative, the values were 24.07±0.94 versus 29.73±1.93 U/L and the difference was statistically significant ($P<0.05$).

Biochemical markers showed significant difference in favour of combined antegrade and retrograde cold blood cardioplegia. The higher release of marker with antegrade cold blood cardioplegia may at least be partly attributed to ischaemic damage resulting from suboptimal myocardial protection. A prospective, randomized study comparing combined antegrade with retrograde cold blood cardioplegia versus antegrade cold blood cardioplegia by Yau et al[5]. and Pelletier et al[6]. showed similar level with that of the present study.

Conclusion:

The results of this prospective clinical trial indicate that combined antegrade and retrograde cold blood cardioplegia is clinically safe and appropriate method that provides better myocardial protection during coronary artery bypass surgery than antegrade cold blood cardioplegia alone.

The more sensitive index of myocardial enzyme release suggests that a more optimal myocardial protection with less cellular damage albeit reversible is obtained with combined antegrade and retrograde cold blood cardioplegia. However, it appears advantageous and at this moment, it is concluded that according to findings of this study, it is currently recommended method of choice for myocardial protection during coronary artery bypass surgery in NICVD patients.

References:

1. Sabiston DC, Spencer FC, Aubrey C, Galloway, Calvin SB. Bypass grafting for Coronary artery disease. In: Sabiston DC, Spencer FC, editors. Surgery of the chest. 6th ed. Philadelphia: WB Saunders Company; 1995; 54: 1884-909.
2. Read RL, Bracey AW, Hudson JD, Muller TA, Fisher RP. Hypothermia and blood coagulation: Dissociation between enzyme activity and clotting factor lebels. Circ Shock 1990; 32 : 141-52.
3. Baumgartner FJ. Cardiopolmonary bypass and myocardial protection. In: Baumgartner FJ, editor. Cardiothoracic surgery. US and Canada: RG Landes Company and Chapman and Hall, 1997; 19 20.
4. Drinkwater DC, Cushen CK, Laks H, Buckberg GD. The use of combined antegrade - retrograde infusion of blood cardisplegic solution in pediatric patients undergoing heart operations: Candiopulmonary bypass, myocardial management and support techniques. J Thorac Cardiovasc Surg 1992; 104: 1349 - 55.
5. Yau TM, Ikonomidis JS, Weisel RD, Mickle DAG, Ivanov J, Mohabeer MK, et al. Ventricular function after normothermic versus hypothermic cardioplegia. J Thorac Candiovasc Surg 1993; 105: 833-44.
6. Pelletier LC, Searle NR. Does retrograde administration of blood carioplegia improve myocardial protection during first operation for coronary artery bypass grafting. Ann Thorac Surg 1997; 64:1256 62.

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REVIEW ARTICLE

Concepts in Pulmonary Rehabilitation

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Abstract:

Art of medical practice where individually tailored multidiscipli-nary program is formulated to stabilise or reverse both the physio psychopathology of pulmonary disease in here attempt is made to return the patient to the highest possible functional capacity. The exactors the physical therapy in the contact of pulmonary rehabilitation tends not be well understood by most physician. This paper review about this comprehensive care disiqned to help prevent the premature morbidity and mortality of such patients and reduce hospital stay

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Introduction:

Pulmonary rehabilitation is defined as comprehensive team approach that provides patients with the ability to adapt to their chronic lung diseases[1]. Respiratory distress can be frequently disabling. In UK one in five deaths, one in three working days lost and a quarter of medical admissions are due to respiratory diseases[2]. In Bangladesh statistics may be more disappointing. Disability is largely due to chronic bronchitis, emphysema and bronchial asthma. These are commonly as a consequence of cigarette smoking and environmental pollution and these imposes a huge social and economic burden on the society. A good understanding of pulmonary function tests and the mechanism and of work of breathing in the normal and diseased states is essential in planning an effective physical therapy for persons with pulmonary disease [3]

Classification of respiratory diseases: Respiratory disease can be classified into two broad groups, obstructive airway diseases and restrictive airway diseases.

Obstructive disorders: Obstructive disorders are accompanied by fixation of chest in a position larger than the normal end expiatory level with an increase in functional residual capacity and residual volume and are characterized by flattening & reduced efficacy of the diaphragm, and contraction of the accessory respiratory muscles.

Restrictive Disorders:

Restrictive disorders are characterized by an increased requirement of energy to overcome elastic recoil of lung and chest structure at any given ventilation. Any disease that stiffens costovertebral or sternocostal connections or causes fibrosis or paralysis of respiratory, abdominal or shoulder girdle muscles or of the lungs themselves can lead to restrictive impairment of pulmonary function. Structural deformities like scholiosis, kyphosis, pectus excavatum, pectus carinatum has little impact on respiratory function. Ankylosing spondilities produces profound limitation of respiratory function in advanced case mainly due to inflammatory stiffness of costovertebral joints. Neurological disorders commonly encountered are chronic debility, stroke and spinal cord injury, gullain bare syndrome, muscular dystrophy, motor neuron disease, and polio affecting phrenic nerve. Main causes of morbidity and mortality in all these conditions are poor ventilation, retention of secretion and atelectasis.

Role of rehabilitation physician: Rehabilitation treatment is an adjunct to the pharmacological treatment, not an alternative to pharmacological

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treatment. Specialist in pulmonary rehabilitation can help the patient by using different modalities of chest physical therapy, by training and retraining of respiratory muscles and by assisted ventilation.

Training and retraining of respiratory muscles: In COPD, chest is in a position larger than normal end expiatory level, diaphragm is flattened and less useful. Help can be afforded by retraining to ensure relaxation of the abdominal muscle during inspiration. The best method is the use of exercises that contract the abdominal muscles during expirations.

The minimal total ventilation given for an alveolar ventilation is attained by slow deep breathing. Training can ensure expansion of chest and better aeration of the lungs. Exercise produces stimulation of respiratory muscles, if emphasis is put on deeper faster inhalation and slower exhalation through pursed lips. Once the training effect has been achieved, regular exercise must be continued or the gain will be lost[4].

Chest physical therapy: This is the application of physical methods to the respiratory care of patients with pulmonary disease. Range of treatment includes: Instruction in relaxation and breathing exercises, postural drainage, percussion, clapping, vibration and splitting to facilitate coughing[5].

Chest physical therapy is indicated in the following pulmonary conditions Bronchial Asthma, Cornice bronchitis, Pulmonary emphysema, bronchiectasis and cystic fibrosis, after major surgery of upper abdomen, thorax and cardiovascular systems, all patient who are dependent on mechanical ventilation and patients with neuromuscular disease or diminished cough reflexes who are unable to mobilizes their pulmonary secretions.

Breathing exercises Postural drainage: Therapist should instruct the patient in the technique of breathing exercise and relaxation. Patients with poor cough and wide spread pulmonary secretion, who are confined to bed should be put on dependent position so that gravity facilitate postural drainage. Chest percussion or clapping and vibration either manually or mechanically are necessary and are useful adjunct in clearing secretions. Post operative patients can be helped by manual splitting of the chest and coughing while hugging a pillow. In the acutely ill patients chest physical therapy may be given as frequently as every two hours and should be closely coordinated.[6] It is therefore important to provide respiratory care for all these conditions. Postural drainage, deep breathing, mobilizing, stretching and strengthening exercises of respiratory muscles are basic things to improve these conditions

Cox et al studied 44 persons with asthma or mild COPD who participated in a 3 month comprehensive program breathing exercise and postural drainage and were followed for a two year period along with control group. The treatment group shows improvement in endurance, decreased body fat percentage, an increase in working days, more active lives and a decrease in consumption of medical care[7]. Studies of long term effect of chest physiotherapy aimed at improving breathing pattern have been few (Sutton and coworkers 1982).[8] Postural drainage is of undoubted benefit in patients with excessive bronchial secretion.(Cochrane, Webber and Clark)[9]. Cornudella and Sangenes limited the role of chest physical therapy in few conditions only. They mentioned that with the exception of cystic fibrosis and bronchiectasis, it is difficult to see a specific role for chest physiotherapy in respiratory rehabilitation[10]. With lesion bellow 4th cervical segment spontaneous respiration is possible but because of lack of movement of intercostal and flaccidly of abdominal muscles, respiratory complications occur frequently. To prevent the respiratory complications in these patient it is essential to turn the patient frequently, four deep breathing exercise every four hour, chest percussion and use of incentive spirometry.[5]

Incentive Spirometry: The incentive spirometer can help all types of patients ranging from those who are debilitated and bed bound to those with stroke and spinal cord injury or muscular dystrophy.

Normal individuals prevent alveolar collapse with occasional deep breath and yawns. There is collapse of alveoli in some of the conditions mentioned above. The regular use of this spirometer maintains the means of maximal lung inflation. It is the daily improvement in volumes that provides incentive to the patient.[2]

Mechanical ventilation: Mechanical ventilation in patient with neuromuscular disorders has been facilitated in the past 15 years by the development of portable ventilators. Patients with high and mid cervical quadriplegia mostly due to cervical spine fracture will invariably require mechanical ventilation during initial hospitalization. Diaphragmatic strengthening and endurance training can be used to facilitate weaning in the high quadriplegic patient in whom there is partial involvement of phrenic nerve at C3 to C5 level. (Lerman).[11] It has been demonstrated by Graeely et al that chronic ventilator dependent unit in acute hospital care is cost effective. [12]

In patient whose respiratory status is compromised, there may be alteration in central drive for breathing. Mechanical ventilation is necessary when signs and symptoms of respiratory failure develop. Tobin recently reviewed the current concept in mechanical ventilation. [13]

Non invasive artificial ventilation is the use of a ventilator without an endotracheal or tracheostomy tube the concomitant use of the inexsuflator is necessary for removal of trcheobronchial secretions. In case of advanced COPD, mechanical ventilation via a tracheostomy is often necessary for survival. Because of multi disciplinary approach, weaning can be performed with greater success in such a unit. COPD was usually the most frequent diagnosis[12,13].

Diaphragmatic pacing : It is a highly sophisticated form of mechanical ventilation. It has been available in the clinical setting for over 20 years, attained a higher level of reliability and broader application in the past decade. Diaphragmatic pacing is indicated in patients who have damage to respiratory control center or their pathway in the brainstem and spinal cord. The pacing system consist of an external transmitter and antenna, an implanted electrode and receiver. Infection, failure of components and the need to retain a tracheostomy because of obstructive sleep apnea are possible complications. Cost and risk of surgery are limiting factors in the case of pacers[14,15]

Conclusion:

Despite the armamentarium of pharmacological and biologic advancement in the treatment of respiratory disorders most of the restrictive and many of the chronic obstructive disorders are disabling. Rehabilitation can seldom restore normal health. Inspire of all doubts and debates rehabilitation physician can help a lot to improve respiratory function and exercise capacity. . The key elements of rehabilitation are considered to be patient and family education, chest physical therapy, breathing training and exercise, oxygen therapy, incentive spirometry, electrophrenic stimulation and patient support groups. It is the provision of all these form of therapy together , within the context of rehabilitation program facilitated by multidisciplinary team that makes the management of respiratory disease distinct from conventional management. Health care delivery system must take into account the need for pulmonary rehabilitation at all ages in society, from the premature infant with bronchopulmonary dysphasia to the young adult with exercise induced asthma to the octogenarian with bronchitis and chronic obstructive pulmonary disease.

References:

1. Tiep Bl; Reversing Disability of Irreversible lung diseases, West J Med 1991 : 154, 591-597.
2. J. Moxham, Respiratory Rehabilitation; In Rehabilitation of Physically Disabled Adult; Goodwill, Chamberlain, Evans, Statnely Thomas Ltd. 2nd Ed. 1997, P-217-232.
3. Haas F, Axen K (ed.), Pulmonary therapy and Rehabilitation, Principle and practice 2nd. Baltimore, Williams and Walkins, 1991, p-29-42.
4. Casaburi R, principles of exercise testing, chest 1992; 101(suppl), 263s-267s.
5. Frederick H, Helmolz JR., Henry HS, Rehabilitation For Respiratory Dysfunction, In Kristen's Handbook Of Physical Medicine And Rehabilitation, Kotke, Lehman, WB Saunders, 4th Ed. 558-73. 1990.
6. Helpern D, Technique of Bronchial Drainage, Department of Physical Medicine And Rehabilitation, University Of Minnesota Medical School, 1967.
7. Cox N H, Hendric J C, Binkhorst RA et al; Pulmonary rehabilitation Program for Patients with asthma and mild chronic

obstructive pulmonary disease; Lung 1993, 13, 109-117.

8. Sutton PP, et al, Chest Physiotherapy A Review European Journal of Respiratory Disease 63, 188-201, 1982.
9. Cochrane GM, Weber BA, And Clarke SW Effects of Sputum on Pulmonary Function. BMJ 289, 1643-4, 1984.
10. Cornudella R, Sangenis M, Chest Physiotherapy, European Respiratory Review, 1, 503-1991.
11. Lerman RM., Wiess M S, Progressive resistive exercise in weaning high quadriplegia from the ventilators, Paraplegia; 1987; 25, 130-135.
12. Gracely D K, Vaggiano R W, Naseem J M, et al, Outcomes of patients admitted to chronic ventilator dependent unit in an acute care hospital, Mayo Chin Proc, 1992; 67 : 131-136.
13. Donner CF and Howard P, Pulmonary Rehabilitation In COPD With Recommendations For Its Use. European Respiratory Review, 1, 463-568.
14. Glenn W W L et al, Long Term Ventilators Support By Diaphragm Pacing In quadriplegia, 183-566, 1976.
15. Moxham J, Shneerson Dim, Diaphragm Pacing, American Review Of Respiratory Disease 148, 533-6, 1993.

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CASE REPORTS

Pelvic Tuberculosis with Various Presentations

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Abstract

Pelvic tuberculosis is difficult to diagnose at times owing to its peculiar varied mode of presentation. Recently, three interesting cases of pelvic tuberculosis presented to the department of Obstetrics and Gynaecology of Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital with atypical features. Among these three cases; firstly, a lady presented to us having dysmenorrhoea, irregular pervaginal spotting with tubo-ovarian mass. After Laparatomy, Total Abdominal Hysterectomy (TAH) with Bilateral Slapingo Oophorectomy (BLSO) were performed. Specimen was sent for histopathology, AFB (Acid Fast Bacillus) staining and culture in Lowenstein-Jensen media. Report confirmed a case of tuberculosis. The 2nd case was an unmarried girl presented as a case of large fixed abdomino-pelvic mass of about 16 weeks size. Laparatomy was done. Biopsy-histopathology, AFB staining and culture showed tuberculosis. Presenting feature of 3rd case was an ovarian mass (10cmx12cm) with raised CA-125 and huge ascetic. After laparatomy, TAH and BLSO with infracolic omentectomy were done. The report was same as the other cases.

[Chest & Heart Journal 2004; 28(1) : 29-31]

Introduction

In developing countries, genital tract tuberculosis occurs most frequently in women of childbearing age'. The incidence of genital tuberculosis varies widely with the social status of the patient and her environment. Genital tuberculosis usually results from heamatogenous spread from any previous primary focus and about 38 to 80% of women with genital tract tuberculosis have evidence of extra genital tuberculosis[2,3]. Usually treatment of pelvic tuberculosis is medica,l but due to its varied presentations, tuberculosis remains undiagnosed. As a result, surgery is done at random. Tuberculosis is diagnosed afterwards by histopathology and bacteriology reports. Meticulous history taking and precise investigation can drastically reduce incidence of surgery in such cases.

Presentations

Case 1

A 42 years old lady was admitted in BSMMU Hospital with the complaints of dysmenorrhoea, irregular pervaginal bleeding (spotting) with intermenestrual pelvic pain for 6 months. Patient got full regime of different types of antibiotics for last 4 months. In spite of having medical treatment the patient was not responding at all.

On per abdominal examination, lower abdomen was very tender but no mass was palpable. On per vaginal examination and per speculum examination, cervix was hypertrophied but healthy. On bimanual examination uterus was retroverted, fixed; right fornix was tender and a small ill-defined mass was felt through it. Left fornix was tender. Our provisional diagnosis was pelvic inflammatory disease.

Her transvaginal ultrasonogram showed a complex cystic area measured about (6.0 cm x 5.4cm) with internal echogenicity, fluid collection was seen in the pouch of Douglas. CA-125 level was 150 IU/L and ESR was raised.

After Laparatomy, it was found that right ovary and right tube was adherent firmly forming a complex mass. Uterus was fixed and retroverted, pouch of Douglas was reduced. Left ovary showed multiple small cysts. TAH with BLSO were done. Surgery was a cumbersome one having little cleavage. After operation, specimen was sent for histopathology and bacteriology. Report showed tuberculosis.

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Case2

An unmarried girl of 20 years of age came to BSMMU Hospital with complaints of a large mass in abdomen for last one month with loss of appetite and low grade fever.

On abdominal examination, slight ascltes was present, mass was fixed and size was of 16 weeks. Per vaginal examination was not done. On per rectal examination, the rectal mucous was found free.

CA-125 was 556 IU/L. PCP for tuberculosis was negative. USG showed a mass arising from right ovary, which was partly cystic, partly solid, uterus was normal in size and left ovary was not well visualized.

Depending on clinical examination and investigations, patient was provisionally diagnosed as a case of malignant ovarian tumor.

Accordingly, laparatomy was done. During surgery, opening of peritoneum was difficult due to dense adhesion, right fallopian tube was swollen and it was full of pus. Fallopian tubes were adherent with the surrounding structures. So, to prevent fistula no definite surgery was done, only biopsy was taken and sent for histopathology and culture. AFB staining was also requested. Tube was drained by salpingostomy, collected pus was sent for culture. All reports revealed tuberculosis.

Case 3

A 46 years old lady admitted in BSMMU Hospital with complaints of ascites and loss of appetite for 5 months. On per abdominal examination ascutes was present but no mass was palpable. Per speculum examination revealed healthy cervix. On bimanual examination uterine size was not delineated due to huge ascetic. Per rectal examination showed free rectal mucous.

On investigation, USG showed a left ovarian tumor (8.0 cm x 9.5cm), CA-125 was 994 IU/L, ascistic fluid was straw coloured, where some atypical cells were found. She was provisionally diagnosed as a case of malignant ovarian tumor.

On laparatomy, seedling-secondary like deposits was seen all over the momentum and under surface of the diaphragm. Peritoneal fluid was straw coloured. TAH with BLSO with infracolic omentectomy were done. Peritoneal fluid and other specimens were sent for histopathology, culture and bacteriology. Reports revealed a case of tuberculosis.

Discussion

Tuberculosis of the female genital tract is common amongst all communities where pulmonary or other forms of extra genital tuberculosis are prevalent. Patient with pelvic tuberculosis usually complains of infertility, dysmenorrhoea, and pelvic pain, evidence of tubercular peritonitis and in 50% of cases adenexal masses are palpable on pelvic examination [3A]. Endometrial involvement may result in amenorrhoea or some other disturbance of the menstrual cycle. Lower abdominal pain is commonly associated with low-grade fever, asthenia and weight loss in up to 60% of patients. Pelvic tuberculosis is usually encountered in the course of a gynecologic operation done for other reasons. Although it may be mistaken for chronic inflammation, some distinguishing features may also be formed, like extremely dense adhesive mass without cleavage, segmented dilatation of the tubes etc.

Diagnosis is made on clinical examination and investigations. X-ray chest is done to diagnose pulmonary tuberculosis. Although 10% of women with proven endometrial infection have had babies or abortions, the commonest symptom of pelvic tuberculosis is primary sterility. This is a feature of about 70% cases. Hystero-salpingography is done in cases of infertility in order to know the tubal condition. High ESR, peripheral blood eosinophilia and a strongly positive mantoux test are additional evidence of tuberculosis infection. If tuberculosis is suspected and lesion is accessible, laparotomy is done and diagnosis is made by examining biopsy material both bacteriologically and histologically. Ziehl Nelson Stainies followed by culture on Lowenstein-Jensen medium carries out detection of AFB. Endometrial biopsy was also taken by curettage or from menstrual discharge [8].

Treatment of genital tuberculosis is mainly medical. Conventional short course chemotherapy with multiple drug regimens is used. Sometimes the cases may end up to surgery but this should be reserved for severe or life-threatening complications, such as.

- Hemorrhage
- Non-resolving masses with medical therapy
- Resistant or reactivated disease
- Fistula formation
- Persistent membrane irregularities
- Suspicion of malignancy[2]

The prognosis for life and health is excellent if anti-tuberculosis chemotherapy is instituted promptly but the prognosis for fertility is poor.

References:

1. Bazaz-Malik G, Maheshwary B, Lal N. Tuberculous endometritis: a clinico-pathological study of 1000 cases. Br J Obstet Gynaecol 1983; 90 : 84.
2. Garcia-Rodriguez JA, Garcia-Sanchez JE, Munoz-Bellido JL et al. Genitourinary tuberculosis in Spain: review of 81 cases. Clin Infect Dis 1994; 18 : 557.
3. Sutherland AM. Tuberculosis of female genital tract. Tubercle 1985; 66 : 79.
4. Falk V, Ludviksson K, Agren G. Genital tuberculosis in women. Am J Obstet Gynccol 1980; 138 : 974.
5. Dechemey AH, Nathan L. editors. Current obstetric and gynaecological diagnosis and treatment. 9th ed. USA: Lange Medical Book, McGraw Hill Medical Publishing Division; 2003. P 742-743.
6. Ferrie BG, Rundle JSH. Genito-urinary tuberculosis in Glasgow 1970 to 1979: a review of 230 cases. Scott Med J 1985; 30 : 30.
7. Tindall VR. Infections. In: Jeffcoate's principles of gynaecology. 5th ed. England: Butterwoths & Co. Ltd; 1987. P 290 - 310.
8. Edmonds D K. Pelvic infection due to tuberculosis. In: Dewharts Textbook of Obstetrics & Gynaecology for Postgraduates. 6th ed. UK: Blackwell Science Ltd; 1999. P 405-406.

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Eosinophilic Granuloma : A Case Report

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Abstruct:

Miss Joytun, 9 years old girl was admitted in NIDCH with the complaints of reccurrent non tender,firm to hard cervical and axillary lymphadenopathy. It was associated with occassional low grade fever of no definite pattern. General examination was unremarkable and systemic examination was also normal. Lymph node biopsy revealed eosinophilic granuloma. Steroid along with Cyclophosphamide was prescribed and patient was improving.

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Introduction:

An eosinophilic granuloma would be a granuloma made up of eosinophils; however, the situation is more complicated. Initially, it appeared that eosinophilic granuloma was just what it sounds like but as it was studied more thoroughly, it was found that there were three different types of this condition and not all were granulomas and not all involved eosinophils. Eosinophilic granuloma is a component of Langerhans cell histiocytosis (LCH) also known as histiocytosis X which means intense proliferation of reticulohistiocytic cells[1]. It is of three types such as

(i) Eosinophilic granuloma (EG)

- 60-80% of histiocytosis X
- age 5- 10 yrs
- presentation: bone pain, local swelling, irritability
- bones
  * 50 - 75% solitary / monostotic
  * skull/mandible (50%):
  * punched-out" lucencies, "hole within a hole", "button sequestrum", "floating teeth"
  * spine/pelvis (25%): vertebra plana (most common pediatric cause)
- long bones (15%): medullary lucency a-/- thin sclerotic rim
- lungs
  * involved in <10%, signals worse prognosis
  * apical reticulonodular infiltrates
  * honeycomb lung

(ii) Hand-Schuller-Christian disease
  * age 1- 3 yrs

(iii) Letterer-Siwe disease
  * age 0- 1 yrs
  * worst prognosis

Case Report:

Miss Joytun, 9 years old girl from Satkania Chittagong was suffering from recurrent nodular swelling of different parts of the body involving neck and axillary region for one year. It was associated with occassional low grade fever of no definite pattern. But she does not complaints of cough, haemoptysis, chest pain or weight loss. She did not give any history of contact with tuberculous patients.

With this complaints she was admitted in CMCH where biopsy revealed chronic non-specific

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lymphadenitis with positive serological test for tuberculosis and was treated with antitubercular chemotherapy but no improvement and then she got admitted in NIDCH for further evaluation.

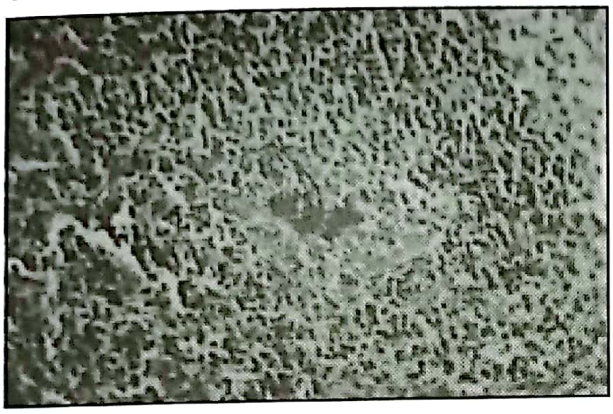

Fig.-1 : *Histological fecitures of eosinophilic granuloma. (Courtesy : Dr. Rashidul Hassan)*

On examination:

There was generalized lymphadenopathy involving predominantly cervical and also axillary region of different size and shape. Some were firm, some were hard, and also non-tender. Patient was afebrile with well built and nutritional status. Pulse was 90 bpm regular, BP 110/70mmHg. There were no organomegally. Other general and systemic examinations were normal.

Laboratory Findings:

Routine blood examination showed normal total count with eosinophils 9%, haemoglobin 11.4 gm/dL and ESR was 107 mm in 1st hour. Blood urea and creatinine were normal. Her liver function tests were also normal. Tuberculin test was negative. Lymph node biopsy showed proliferation of histiocytic cells with small nucleus and abundant clear looking cytoplasm along with lymphocytes, plasma cell, eosinophils, suggestive of langerhans' cell histiocytosis (Eosinophillic granuloma type).

Treatment:

The patient was prescribed steroid along with cyclophophamide. The patient gradually showed improvement and after 4 weeks was discharged with advice for follow-up every monthly.

Discussion:

Eosinophilic granuloma of lymph node is a special variant of histiocytosis X. It is also known as primary eosinophilic granuloma of lymph nodes. This variant involves one or more lymph nodes, but does not infiltrate any other organs. Histologically, the infiltration of lymph nodes by histiocytosis X cells and eosinophils is similar to that seen in disseminated or metastatic histiocytosis X. Most cases of eosinophilic granuloma of lymph nodes are recognizable as primary, however, by the heavy infiltration of the surrounding tissue. The predominant proliferating cells are histiocytosis X cells ('Langerhans cells'), which contain Birbeck granules on electron microscopy and are lysozyme-negative[2]. An immunohistochemical study on paraffin sections and for one case on frozen sections, reveals the usual phenotype of Langerhans' cells: these cells stain positively with S 100 protein and CD 1 and are negative for both lysozyme and al antichymotrypsine[3]. Primary eosinophilic granuloma of lymph nodes occurs predominantly in children and young adults and shows a slight preponderance of males. Clinically, the patients present with mostly afebrile and sometimes painful lymphadenopathy, which is more often solitary (in the cervical or inguinal region) than widespread. The erythrocyte sedimentation rate and/or serum alpha 2-globulin level are elevated in many patients. There may also be an increase in the number of leucocytes, especially eosinophils, in the blood. The prognosis is favourable: the lymphadenopathy disappeared spontaneously in most patients but occassionally recurrences. Thus, primary eosophilic granuloma of lymph nodes is interpreted as a benign lesion. It might be a special reaction of the T cell system[1].

References:

1. Robert M, Marty-Double C. Eosinophilic granuloma. Br Med J 1996; 2 : 552-6.
2. Motoi M, Helbron D, Kaiserling E, Lennert K. Histocytosis X.Med Clin North Am 2002; 75: 197-9
3. Charles E. Kahn. Eosinophilic granuloma. Am J Med 1995; 68 : 59.