

## Laboratory Profiles of Pleural effusion Collected from Children: Experience at a Tertiary Care Hospital in Bangladesh

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### Abstract

**Background:** Pleural effusion occurs in many reasons. Laboratory tests are necessary to find out the causes. **Objective:** This study was an attempt to know the laboratory findings of pleural effusion. **Methodology:** This cross-sectional study of thirty (30) admitted cases with pleural effusion confirmed by chest radiography and aspiration of pleural fluid from one (1) year to twelve (12) years age of either sex were collected purposively. This study was carried out from July 2009 to February 2010 in the Department of Pediatrics at Rajshahi Medical College Hospital. All information were recorded in pre tested semi structured questionnaire. **Results:** Color of pleural fluid was straw in 56.7%, clear in 30.0%, blood stained in 13.3%. In this study, lymphocyte predominance among 56.7% cases, acid fast bacilli in 3.3% cases and raised protein of more than 3gm/dl and sugar less than 60mg/dl in 93.3% cases in pleural fluid. **Conclusion:** In almost all cases protein is raised and sugar is less in pleural fluid. [J Shaheed Suhrawardy Med Coll, 2013;5(1):26-27]

**Key words:** pleural effusion, Cytological of pleural fluid, biochemical analysis of pleural fluid.

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### Introduction

Pleural effusions are accumulations of fluid within the pleural space. The fluid enters the pleural space from systemic capillaries in the parietal pleura and exits via parietal pleural stomas and lymphatics. Pleural fluid accumulates when too much fluid enters or too little fluid exits the pleural space. They are classified as transudates or exudates. Asymptomatic transudates require no treatment. Symptomatic transudates and almost all exudates require thoracentesis, chest tube drainage, pleurodesis, pleurectomy or a combination<sup>1</sup>.

It has been reported that, incidence of parapneumonic effusion ranges from 20% to 91% with an increase in morbidity and mortality<sup>2</sup>. Parapneumonic effusion is more common in boys than girls and more frequently encountered in infants and young children<sup>3</sup>. Non bacterial infectious agents such as virus and Mycoplasma pneumoniae are the common causes of pleural effusion in children throughout the world. The frequency of viral infection in children is

much higher than bacterial infection, though bacteria are more likely than virus to cause pleural effusion. As many as 20% of these infection can cause small and transient effusion that resolve spontaneously<sup>4</sup>. Out of 176 children with pulmonary tuberculosis, from Spain, 39(22%) patients had pleural effusion<sup>5</sup>. Chaginaud<sup>6</sup> found pleural effusion in 10(71%) out of 14 children with lymphoblastic lymphomas and in 7(12%) out of 60 children with non-Hodgkins lymphoma<sup>6</sup>.

It is justified to know the laboratory findings in order to avoid delays in confirm diagnosis, proper treatment and outcome of pleural effusion in children.

### Methodology

This cross-sectional study was conducted in the Pediatrics and other respective department of Rajshahi Medical College & Hospital from July 2009 to Feb 2010. A total number of thirty (30) admitted patients with Pleural effusion, confirmed by chest radiography and aspiration of pleural fluid of one (1) year to twelve (12) years age of

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either sex were selected purposively. The parents were explained about the purpose of the study. Both the written & verbal consents were taken from the parents without any coercion. When parents did not give consent for any particular case next case was selected. The exclusion criteria were very sick children, age below one year and above twelve years, previously treated pleural effusion cases, Cases having any other chronic illness or co-morbid situation. All information's were recorded in pre tested semi structured questionnaire. Ethical clearance was taken from institutional ethical review board.

### Results

Color of pleural fluid was Straw in 17(56.7%), clear in 9(30.0%), blood stained in 4 (13.3%) (Table 1).

**Table 1: Physical characteristics of pleural fluid**

Color	Frequency	Percentage
Blood stained	4	13.3
Straw colored	17	56.7
Clear color	9	30.0

Cytological and biochemical analysis showed lymphocyte predominance in 17 (56.7%) cases, malignant cell in 1 (3.3%) case and raised protein of more than 3 gm/dl and sugar less than 60 mg/dl in 28 (93.3%) cases (Table 2).

**Table 2: Cytological and biochemical finding of pleural fluid**

Parameters	Frequency	Percentage
Lymphocytosis	17	56.7
Sugar <60mg/dL	28	93.3
Protein >3gm/dL	28	93.3
Malignant Cell	1	3.3

Culture was positive (*S. pneumoniae*) in 2(6.67%) cases, and no organism was isolated in 28(93.3%) cases (Table 3).

**Table 3: Culture of pleural fluid**

Culture Result	Number (n=30)	Percentage
Culture Positive	2	6.7
Culture Negative	28	93.3

### Discussion

In a study at UK conducted by Barnes NP found 96% of the cases were diagnosed by ultrasonography<sup>7</sup>. However, in this study, X-ray chest and thoracentesis were the main

diagnostic tools for the diagnosis. A UK study showed *Streptococcus pneumoniae* was the commonest causative organism followed by group A *Streptococcus*, *Staphylococcus aureus*, *Haemophilus influenzae* and *Coliform*<sup>7</sup>. In our study, *Streptococcus pneumoniae* was also the main causative organism. The pleural fluid leukocyte count shows a wide variation in values between non purulent effusion and frankly purulent effusion and predominance of lymphocyte in an exudate should raise the possibility of malignancy or tuberculosis<sup>8</sup>. In our study, lymphocytosis in exudative fluid was due to tuberculosis or malignancy. In a study in Nigerians 167 patients, pleura fluid was predominantly lymphocyte in 83% of cases, glucose concentration was less than 60mg/dl in 54% and *M. tuberculosis* was cultured from only 12%<sup>9</sup>. In this study lymphocyte predominance among 56.7% cases, acid fast bacilli in 3.3% case and raised protein of more than 3gm/dl and sugar less than 60mg/dl in 93.3% cases. In many developing countries of the world the most common cause of exudative pleural effusion is pulmonary tuberculosis but this is relatively uncommon in united states<sup>10</sup>.

### Conclusion

In almost in all cases protein was raised and sugar was less in pleural fluid. Limitation of this study was small sample size. Some important investigations such as LDH, adenosine diaminase level, pleural biopsy were not possible due to lack of adequate facilities.

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