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ROLE OF PLEURAL BIOPSY IN THE EVALUATION OF THE PLEURAL EFFUSION

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ABSTRACT--*In a hospital where thoracoscopy is not available, pleural biopsy can be used for the diagnosis of exudative effusion in conditi0ons where malignancy is doubted and when results of pleural effusion are not conclusive. In a country with limited resources like India pleural biopsy can still be used for the diagnosis of pleural effusion. 1.To study use of pleural biopsy in evaluation of pleural effusion.2. To correlate the pleural biopsy with biochemical and cytological findings of pleural fluid.3. To find the complications of pleural biopsy. An observational cross sectional study will be conducted in Acharya Vinoba Bhave Rural Hospital among 70 patients admitted with exudative pleural effusion. Pleural biopsy will be done and pleural fluid investigations will be send. Cause of pleural effusion can be obtained from the pleural biopsy. Malignancy and tuberculosis are the most frequent reasons of pleural effusion according to previous studies. Whether pleural biopsy gives definitive diagnosis as compared to pleural fluid cytology or pleural fluid CBNAAT. Pleural biopsy is associated with minimal post procedure complications Pleural Biopsy helps in the identifying the etiology of undiagnosed pleural effusion. Complications associated with pleural biopsy is less. Closed pleural biopsy helps identifying cause of the exudative pleural effusion when thoracoscopy is not available.*

KEY WORDS-- *pleural biopsy, pleural effusion, thoracoscopy, tuberculosis, malignant pleural effusion*

I. INTRODUCTION

Pleural effusion is the collection of pleural fluid in the pleural space due to imbalance between rate of absorption and formation of pleural fluid. Pleural effusion itself not a disease but it's sign of an underlying disease. There are many causes of pleural effusions. Pleural effusions are generally classified into two broad categories- exudative and transudative pleural effusion (1-4).

When a patient with undiagnosed pleural effusion is evaluated, first question is to find whether the patient has transudate or exudate effusion, Transudative pleural effusion is due to systemic disease like heart failure, cirrhosis, nephrotic syndrome or hypoalbuminemia in which underlying pleura remains normal. In exudative effusion, the integrity of pleura abnormal due to tuberculosis, malignancy or other infections. The reason to make this differentiation is that additional diagnostic procedures are indicated for exudative pleural effusions to define cause of effusion (5-8)**.**

Diagnosis of pleural effusion made by history, physical examination, chest X ray and analysis of pleural fluid. Pleural fluid obtained by the thoracentesis is sent for biochemical analysis, cytological analysis and

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microbiological investigations. In spite of all this, it is not possible to establish a diagnosis in all the cases. The common cause of undiagnosed pleural effusion is tuberculosis and malignancy. Invasive modalities like closed pleural biopsy or thoracoscopy is required **when** diagnosis cannot be obtained (3,9-12).

Thoracoscopy involves high instrument cost and procedure requires intercostal drainage, long hospital admission as well as huge hospital expenses. In comparison pleural biopsy is simple, cost effective procedure which can be easily done with minimal procedure related complications. Pleural biopsy is performed by Abrahams needle. Pleural biopsy can be used in the diagnosis of exudative pleural effusion, especially when malignancy is suspected and when the results of pleural effusion are inconclusive especially in a hospital where thoracoscopy is not available. In a country with limited resources like India, pleural biopsy can still be used to evaluate the causes of pleural effusion (12-15). With this background the study will be able to find out the usefulness of pleural biopsy to identify cause of pleural effusion.

Thoracoscopy is investigation of choice where diagnosis of pleural effusion is inconclusive. But it is a costly procedure and requires the he back up of thoracic surgery. Closed pleural biopsy can be easily performed with minimal procedure related complication (16-19). Pleural biopsy can be used to obtain an etiological diagnosis in exudative pleural effusion, especially when malignancy is suspected and when the results of pleural effusion are not conclusive in a hospital where thoracoscopy is not available.

II. OBJECTIVES

1.To study use of pleural biopsy in evaluation of pleural effusion.

2.To correlate the pleural biopsy with biochemical and cytological parameters of pleural fluid.

3. To identify the complications of pleural biopsy.

III. METHODS

Study design: Observational cross sectional study.

Setting: Study will be conducted in the AVBRH, a tertiary care hospital attached to Jawaharlal Nehru Medical Collage (JNMC), situated in the rural area of Sawangi (Meghe) Wardha, in Central India from July 2019 to July 2021.

Participants:

Patient with pleural effusion will be selected on basis of inclusion and exclusion criteria among patients admitted in AVBRH.

INCLUSION CRITERIA:

1.Patient more than 18 of years.

2.Patient with exudative pleural effusion as per Lights criteria

3.Chest X-ray showing signs of pleural effusion

EXCLUSION CRITERIA:

1. Bleeding and coagulation disorders

2.Patient who are not cooperative and not giving consent.

Variables:

Exudative pleural effusion based on light's criteria

Pleural biopsy (histopathology report) for diagnosing the cause of the pleural effusion.

Pleural fluid CBNAAT and ADA for diagnosing tuberulosis

Pleural fluid cytology for diagnosing the malignancy.

IV. DATA SOURCES/ MEASUREMENT

Pleural fluid sample obtained from the patient will be evaluated for pleural fluid ADA

Pleural fluid sample will be sent for pleural fluid CBNAAT.

Pleural fluid cytology will be obtained from pathology department, AVBRH

Pleural Biopsy specimen will send to histopathology department, AVBRH

Bias*:* There will be bias in selection of patients and procedure and technique related bias.

Study size:

Sample size=Z2(SN(1-SN)/W2

Z= Z VALUE (1.96 for 95% confidence interval)

SN= SENSITIVITY (90%)

W- ABSOLUTE PRECESSION (5%)

By considering sensitivity of pleural biopsy in diagnosis of pleural effusion as 90% and confidence interval of 95%i. e 1.96 and absolute precession of 5 % the calculated sample size is 70

Statistical methods:

70 patients will be selected for the study. Pleural biopsy will be done using the Abram's needle. Specimen will be send for histopathlogical analysis. Histopathological results will be collected and will be analysed using SPSS 10.

V. EXPECTED OUTCOMES/RESULTS

Participants: 70 cases of exudative pleural effusion admitted in AVBRH will be selected for the study after obtaining written informed consent for pleural biopsy.

Descriptive data: Patients of pleural effusion will be classified in to exudative and transudative. Exudative effusion patients will undergo pleural biopsy Outcome data: Pleural biopsy report

Main results: Pleural biopsy report which revealed the cause of pleural effusion. Most conditions which will cause pleural effusion are malignancy and tuberculosis. Pleural biopsy can be used instead of thoracoscopy for diagnosis of pleural effusion in places where thoracoscopy is not available.

VI. DISCUSSION

Pleural biopsy will help in diagnosis of the exudative pleural effusion in places where thoracoscopy is not available. Main cause of the exudative effusion could be tuberculosis and malignancy. Pleural biopsy can be used in places where thoracoscopy is not available. It is low cost procedure associated with minimal procedure related complications. A couple of studies were considered and reviewed for understanding the scenario of related factors and conditions in this region (20-75).

Limitations: The main limitation of the study is that there will be no thoracoscopy to compare with. Second limitation of the study will be the technique used for the pleural biopsy which can vary with persons. One attempt of biopsy was done in the current study but other studies had 2/3 biopsies done.

Interpretation: Pleural biopsy will be used in diagnosis of the exudative pleural effusion. Histopathology report from the biopsy specimen gives diagnosis of exudative pleural effusion which will be compared with pleural fluid cytology, pleural fluid ADA and CBNAAT. Cause of pleural effusion will be confirmed by pleural fluid cytology and Pleural fluid ADA and CBNAAT. Pleural biopsy can be used instead of thoracoscopy in places where thoracoscopy is not available. Complication associated with pleural biopsy is minimal.

Generalisability: According to study pleural biopsy can be used in the s diagnosis of exudative pleural effusion. In the current setting, tuberculosis and malignancy was most common cause. The complication associated with procedure is less and is lows cost procedure.

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