A Comparion of Diagnostic Efficacy of Closed Pleural Biopsy and Thoracoscopic Guided Pleural Biopsy in Patients with Pleural Effusion: A Clinical Study

Manisha Bhargava[1], Gunjan Gupta[2]

ABSTRACT

Introduction: A pleural effusion- an excessive accumulation of fluid in the pleural space- indicates an imbalance between pleural fluid formation and removal. This study was conducted to compare the efficacy of closed pleural biopsy and thoracoscopic guided pleural biopsy both techniques in diagnosing pleural effusion.

Material and Methods: This study was conducted on 60 patients of exudative pleural effusion. A complete clinic- radiological evaluation of the patient was done. A pleural fluid analysis including cytopathological examination was also performed. A CPB was done using Cope's pleural biopsy needle and tissue sent for histopathological examination (HPE). Thoracoscopy was done with the patient lying in lateral decubitus position with the affected side upward. During the procedure, local anesthesia was used. Rigid endoscope with viewing angle of zero degrees was used. Biopsy specimens of the parietal pleura were obtained under direct vision and were sent for HPE.

Results: Out of 60 patients, 46 were males and 14 were females. The difference was significant (P-0.02). The age group 20-40 years had 19 males and 5 females while >40 years had 27 males and 9 females. The difference was non significant(P>0.05). 60 patients were subjected to both CPB and TPB. 18 (30%) in CPB and 48 in TPB (80%) were able to diagnose the cause of PE. Tuberculosis was 4 in number and carcinoma was 14 using CPB while TB was 20 and Carcinoma was 28 using TPB. The difference was significant (P<0.05). In TB patients nodularity was seen in 30%, adhesions in 72% and hyperemic in 70% of cases. In carcinoma patients, nodularity was seen in 80%, adhesions in 45% and hyperemic in 40% of cases. The difference was significant (P<0.05). The common symptoms such as breathlessness (75%), cough (66%), chest pain (57%) and fever (42%) was recorded.

Conclusion: Thoracoscopy give better results as compared to CPB. TPB is a minimally invasive procedure has greater diagnostic efficacy and with minimal to no complications as compared to CPB.

Keywords: Closed Pleural Biopsy, Pleural Effusion, Thoracoscopic Guided Pleural Biopsy

INTRODUCTION

A pleural effusion- an excessive accumulation of fluid in the pleural space- indicates an imbalance between pleural fluid formation and removal. The normal pleural space contains a relatively small amount of fluid, 0.1 to 0.2 mL/kg of body weight on each side. Pleural fluid is formed and removed slowly, at an equivalent rate, and has a lower protein concentration than lung and peripheral lymph.[1]

Pleural effusion is a common complication of systemic and localized disease. Most common causes of pleural effusions in India are tuberculosis, pneumonia, malignancies, congestive heart failure, renal failure, connective tissue disorders and pulmonary embolism.[2]

The diagnosis of pleural effusion is achieved by history, clinical examination, radiology and by investigating the pleural fluid. 15–20% of all pleural effusions remain undiagnosed despite intensive efforts. In order to diagnose cases, other diagnostic modalities are looked forward. This includes closed pleural biopsy (CPB) and thoracoscopic pleural biopsy (TPB). By CPB, 45- 50% cases can be diagnosed. It has the highest diagnostic yield in detecting TB and malignancy.[3]

Other suggested method is TPB. Using thoracoscopy, the diagnostic accuracy could reach 96% with 91% sensitivity and 100% specificity. This study was conducted to compare the efficacy of both techniques in diagnosing pleural effusion.

MATERIAL AND METHODS

This study was conducted in Department of General Pathology, on 60 patients of exudative pleural effusion. A case history proforma was prepared and patient information like name, age, gender etc was recorded. A complete clinic- radiological evaluation of the patient was done. A pleural fluid analysis including cytopathological examination was also performed. A CPB was done using Cope's pleural biopsy needle and tissue sent for histopathological examination (HPE). Thoracoscopy was done with the patient lying in lateral decubitus position with the affected side upward. During the procedure, local anesthesia was used. Rigid endoscope with viewing angle of zero degrees was used. Biopsy specimens of the parietal pleura were obtained under direct vision and were sent for HPE.

STATISTICAL ANALYSIS

Results thus obtained were tabulated and subjected to statistical analysis using chi square test. P value <0.05 was considered significant.

RESULTS

Table 1 shows that out of 60 patients, 46 were males and 14 were females. The difference was significant (P-0.02). Table 2 shows that age group 20-40 years had 19 males and 5 females while >40 years had 27 males and 9 females. The difference was

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Total - 60		
Male	Female	P value
46	14	0.02

Table-1: Distribution of patients

Age (years)	Male	Female	P value
20-40	19 (40%)	5 (35%)	0.9
>40	27 (60%)	9 (65%)	1
Total	46	14	

Table-2: Distribution of patients according to age

Detection	CPB (60)	TPB (60)	P value
Total	18	48	0.05
TB	4	20	0.02
Carcinoma	14	28	0.01

Table-3: Detection rate of tuberculosis and carcinoma using CPB and TPB

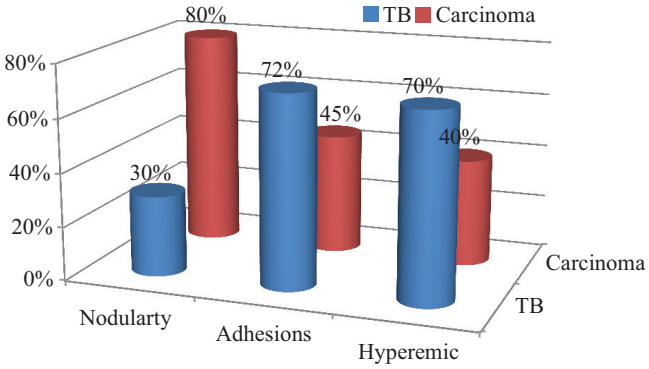

Figure-1: Distribution of disease according to thoracoscopy findings

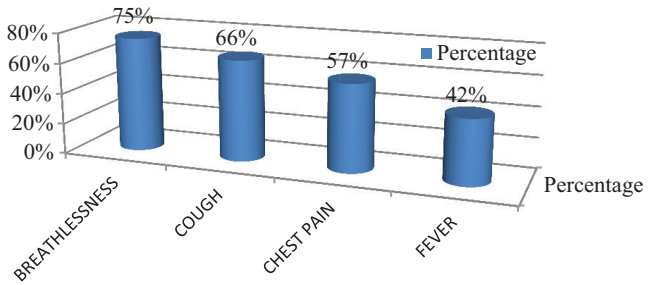

Figure-2: Symptoms recorded among patients

non significant (P>0.05). Table 3 shows that 60 patients were subjected to both CPB and TPB. 18 (30%) in CPB and 48 in TPB (80%) were able to diagnose the cause of PE. Tuberculosis was 4 in number and carcinoma was 14 using CPB while TB was 20 and Carcinoma was 28 using TPB. The difference was significant (P<0.05). Figure 1 shows that in TB patients nodularity was seen in 30%, adhesions in 72% and hyperemic in 70% of cases. In carcinoma patients, nodularity was seen in 80%, adhesions in 45% and hyperemic in 40% of cases. The difference was significant (P<0.05). Figure 2 shows common symptoms such as breathlessness (75%), cough (66%), chest pain (57%) and fever (42%).

DISCUSSION

The main conditions that can be established with needle biopsy of the pleura are tuberculous pleuritis and malignancy of the pleura. Needle biopsy is currently recommended when tuberculous pleuritis is suspected and the pleural fluid adenosine deaminase or interferon- gamma levels are not definitive. This study was conducted to compare the efficacy of both techniques in diagnosing pleural effusion. Out of 60 patients, 46 were males and 14 were females. This is in agreement with Cope C et al.[4] We found that age group 20-40 years had 19 males and 5 females while >40 years had 27 males and 9 females. The maximum number of patients above 40 years of age was also observed in study conducted by Ogirala et al.[5] We found that 18 patients (30%) in CPB and 48 in TPB (80%) were able to diagnose the cause of PE. Tuberculosis was 4 in number and carcinoma was 14 using CPB while TB was 20 and Carcinoma was 28 using TPB. The difference was significant (P<0.05). Our results are in agreement with Verma S et al.[6]

We found that in TB patients nodularity was seen in 30%, adhesions in 72% and hyperemic in 70% of cases. In carcinoma patients, nodularity was seen in 80%, adhesions in 45% and hyperemic in 40% of cases. However, Haris RJ[7] found that in TB patients, nodularity was 65% while in carcinoma patients, it was 24%.

We identified common symptoms such as breathlessness (75%), cough (66%), chest pain (57%) and fever (42%). This was similar as in study done by David S et al.[8]

CONCLUSION

Thoracoscopy give better results as compared to CPB. TPB is a minimally invasive procedure has greater diagnostic efficacy and with minimal to no complications as compared to CPB.

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