

Clinicoepidemiological study of hydropneumothorax in tertiary care hospital in western India

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Abstract

Background: Hydropneumothorax (HPT) is defined as a collection of fluid and air in the pleural cavity. Present study was aimed to study Clinicoepidemiological features of Hydropneumothorax. **Methodology:** Clinically diagnosed and confirmed 100 cases of Hydropneumothorax were included in the present study. Detailed clinical history and laboratory investigation information regarding clinical symptoms and signs were obtained. **Result:** In this study majority of study participants were from 23 to 42 year of age i.e. 57%. Most common complaints were cough 94%, expectoration 90%, dyspnoea 80% and chest pain in 70%. Tuberculosis was the most common etiological factor 92 out of 100 patients. HPT was more common on right side (61%) compare to in left side 39%. **Conclusion:** Most patients were from young adult age group presented most commonly symptoms like cough, expectoration, and dyspnoea and chest pain. TB remains the most common aetiology for Hydropneumothorax.

Key Word: Hydropneumothorax; Tuberculosis.

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INTRODUCTION

Hydropneumothorax (HPT) is defined as a collection of fluid and air in the pleural cavity. It may be localized (encapsulated) or it may involve the entire pleural cavity. HPT is classified as "Acute" or "Chronic" depending upon duration and pathological reaction but there is no sharp dividing line in either time or pathological response between the two. Common causes of HPT are infection, iatrogenic during procedure or aspiration of pleural

effusion and thoracic trauma. Chronic pyogenic infection at thoracic cavity was common in pre-war era, became less frequent in post-war years and now uncommon in developed countries. But acute or chronic infection of pleura is very common in developing countries probably due to poor nutrition and improper management.¹⁻³ Tuberculosis is an important community health problem. Although not very often, pneumothorax, empyema and HPT are complications of pulmonary TB and cause significant morbidity and mortality. Usually these complications are due to the rupture of a sub-pleural tuberculosis focus, parenchyma nidus or small cavity into the pleural space. In most patients with TB bronchopleural and/or pleurocutaneous fistulas are common manifestations. These complications make the management even more difficult.¹ Post-surgical (thoracic) pleural space infections and complications still occur in developing countries as a result of poor post-surgical ICU setup, infrastructure and unavailability of thoracic surgeon. In India, HPT is treated with antimicrobial/antituberculous drugs and intercostals drainage tube or

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surgical procedures like decortications, partial or complete pneumonectomy etc.^{4,5} This results in long hospital stay. Many with poor general condition status cannot be subjected to surgery, so Intercostals drainage tube with antimicrobial agents/antituberculous drugs is alternatively practiced. ⁶ So, present study was aimed to study Clinicoepidemiological features of Hydropneumothorax.

METHODOLOGY

The present study was conducted in Government Medical College Surat. Total 100 patients diagnosed as Hydropneumothorax were included in the study period from Feb. 2012 to January 2018. Total 100 patients of Hydropneumothorax more than 12 years of age and ready to participate in the study were included. Patients having previous history of ICD insertion were excluded from the

study. Ethical permission was obtained from institutional ethics committee. Informed consent was obtained from study participants. Clinically diagnosed and confirmed cases of Hydropneumothorax were included in the present study. Detailed clinical history information regarding clinical symptoms and signs were obtained. The patients were subjected to the routine laboratory tests like blood CBC, ESR, LFT, RFT, RBS, FBS, Serum HbsAg, Sr. HCV, Sr.HIV, sputum for AFB, gram stain with culture sensitively, cytology, pleural fluid or PUS for routine, microscopy , protein, sugar, LDH, cell for total and deff. Count, ADA, TB PCR, pl. fluid culture, Pl. fluid/pus AFB culture and drug sensitivity, chest X-ray, USG chest and abdomen, CT thorax as per requirement. Pleural biopsy/ medical thoracoscopy as required. Descriptive statistics were applied to describe the data.

RESULTS

Table 1: Age and sexwise distribution of study participants

Variable	Study participants	Percentage
Age (years)		
13-22	23	23%
23-32	39	39%
33-42	18	18%
43-52	11	11%
53-62	7	7%
>62	2	2%
Sex		
Male	84	84%
Female	16	16%

In this study 57% of patients are 23 to 42 year of age. This indicates HPT affects young age group leads to economic burden on country and family of the affected patients. Maximum number of study participants were from 23 to 42 years of age group i.e. 39 (39%). Male (84%) outnumbered to female (16%).

Table 2: Clinical features among study participants

Symptoms	No of Patient	Percentage
Cough	94	94
Expectoration	90	90
Fever	48	48
Chest Pain	70	70
Dyspnoea	80	80
Weight Loss	78	78
Haemoptysis	2	2
Tachypnea	86	86
Palpitation	90	90

All the patients were having constitutional symptoms found for 3 to 4 weeks. Most common complaints were cough 94%, expectoration 90%, dyspnoea 80% and chest pain in 70%. Haemoptysis was found only in 2% of patients.

Table 3: Causes of Hydropneumothorax among study participants

Cause	No patient	Percentage
Tuberculosis	92	92 %
Post pneumonic	07	07 %
Post traumatic	00	00%
Amoebic liver abscess	01	01 %
Total	100	100 %

Tuberculosis was the most common etiological factor 92 out of 100 patients but it associated with some other infections in 54 cases. Post pneumonic and amoebic liver abscess etiological factor were found in 7 and 1% respectively.

Table 4: Bacteriological gram stain of plural fluid among study participants

Bacteriological agent	No patients	Gm stain %
pseudomonas	21	21%
Staphylococcus aureus	16	16 %
E-coli	12	12 %
Streptococcus	2	2 %
Enterobacteria	2	2 %
Klebsiella	1	1 %
No organism	46	46 %
Total	100	100 %

No organism were isolated in (46%) of the patients from pus/pleural fluid gram stain and culture. most prevalent organisms were pseudomonas and staphylococcus auras 21% and 16% respectively.

Table 5: Smear AFB staining in sputum and pleural fluid among study participants

AFB staining	No. patients	Percentage
Sputum		
Positive	41	41%
Negative	59	59 %
Total	100	100%
Pleural fluid		
Positive	14	14%
Negative	86	86%
Total	100	100%

Out of 100 patients 41 patients were sputum AFB smear positive at the time of intervention. In 59 patients of sputum AFB smear negative found. Out of 100 patients 14 patients were pleural fluid AFB smear positive at the time of intervention. In 86 patients of pleural fluid AFB smear negative and with pyogenic pleural effusion

Table 5: Lung involment among study participants

	No .of patients	Percentage
Lung involment		
Right lung	61	61%
Left lung	39	39%
Condition of opposite lung		
Normal	60	60%
Emphysematous changes	5	5%
Infiltrative opacity	20	20%
Infiltrative opacity with cavitory lesion	15	15%

HPT was more common on right side (61%) compare to in left side 39%. Bilateral HPT was not found in these 100 patients. Out of these 100 patients, 60% patients had a normal opposite lung. In remaining 40% of patient; 5 had emphysema, 20 had infiltrative lesion, and 15 had infiltrative with cavitary lesions.

DISCUSSION

In present study majority of patients were from 23 to 42 years of age. In India, incidence of HPT is common in young age group due to tuberculosis. According to Kamat *et al*, out of 100 patients, 29 cases had an age below 24 years and 58 were between 25-44 years. Study of R K Tandon *et al* showed that incidence of HPT was more common in 10-40 years age group which is consistent with the present study findings i.e. 57% of patients in 23 to 42 years of age group. Other studies also showed result i.e. A S Geha *et al* and M M Sherman *et al* showed

incidence of HPT were higher after 40 years of age group. These studies were conducted in developed countries where incidence of tuberculosis was low. In the present study proportion of HPT exceedingly dominating in males. Similar results were also seen in different studies is as follows: R.K. Tandon *et al* – 75%, A.S. Geha *et al* – 75.6%, Kamat *et al* – 88% and Emerson *et al* – 83.4%. It is obvious that Males are more prone to mechanical stress due to strenuous work, smoking and tall stature, tuberculosis, chronic bronchitis with emphysema, all these being more common in males⁷⁻¹⁰ Cough, expectoration, chest pain and dyspnoea are the most

common symptoms in the present series and by Kamat *et al.* This may be explained on the basis that tuberculosis being the most common etiological in the present series. In our series, we reported positive gram stain or culture report of pleural fluid in 54% of cases. Bryant *et al* reported 67.8% positive cultured fluid while Sherman *et al* reported 66% positive report and Emerson *et al* reported 69.6% positive report. In present series, fluid culture sensitivity report was negative in 46% of the patients. This negative culture report in present series was related with good number of tuberculous HPT. Tuberculosis organisms do not grow on ordinary media. Special media like Twin 90 and Dorset egg media will take six weeks to grow. In Kamat *et al*, 57% cases were positive for sputum acid-fast bacilli. In my study 41% cases were positive for sputum acid-fast bacilli. Results can be explained by higher rates of underlying tuberculosis.^{7,10} It is evident from the present study that the disease was more common on right side (61%) as compared to left side 39%. Bilateral HPT was not seen in any patients. Other study like R.K. Tandon *et al*, it was right sided 57.14% and Asif *et al* in which right and left lung involved 54 and 46 % respectively. This is probably due to the greater bulk of the right lung. Bilateral HPT is quite an infrequent occurrence in all the series. In my study 40% of patients have opposite lung disease or pathology found in which 5 emphysematous lung, 20 infiltrative lesions, 15 infiltrative lesions with cavitations lesion were found. In these group more complications, mortality and morbidity were found. These patients were less suitable for surgical management due to less reserve lung mass or volume.^{8,10,11}

CONCLUSION

Most patients were from young adult age group presented most commonly symptoms like cough, expectoration, and dyspnoea and chest pain. Pleural fluid investigations

including microbiological and biochemical work-up was useful to establishing etiological diagnosis in Hydropneumothorax. TB remains the most common aetiology for Hydropneumothorax.

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