

THE DIFFERENT TREATMENT MODALITIES OF PYOPNEUMOTHORAX – A STUDY OF 50 CASES

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DOI: 10.5455/ijmsph.2013.180420132

Received Date: 26.03.2013

Accepted Date: 18.04.2013

ABSTRACT

Background: Pyopneumothorax is defined as a collection of pus and air in the pleural cavity. It may be localised (encapsulated) or it may involve the entire pleural cavity. In India, Pyopneumothorax with pre-existing disease is treated with antimicrobial multiple antituberculous drugs and Intercostal drainage tube or surgery.

Aims & Objective: (1) To know the age and sex incidence. (2) To study clinical presentation and characteristics of mode of onset (3) To obtain relationship with smoking. (4) To emphasise the importance of radiological and other investigations as an aid to diagnosis and management. (5) To find out the underlying lung pathology if any. (6) To decide the response to various modes of treatment. (7) To understand the complications of Pyopneumothorax.

Material and Methods: This is a progressive study of 50 Indoor patients with pyopneumothorax admitted in the civil hospital, Ahmedabad in consecutive 3 years. Traumatic pyopneumothorax patients were excluded from the Study. The response to various modes of treatment and complications were noted.

Results: The age incidences indicate that it was high in 21-30 years of age. Most common complaints were cough followed by dyspnoea and chest pain. The mycobacterium tuberculosis was the most common etiological factor. The best modality of treatment was intercostal drainage by tube with antibiotic coverage.

Conclusion: Tuberculosis is main etiology in country like India. Intercostal drainage with under water seal was the treatment of choice in most of the patients. The commonest complication following ICD was surgical emphysema.

KEY-WORDS: Pyopneumothorax; Tuberculosis; Smoking; Intercostal Drainage Tube

Introduction

Pyopneumothorax is defined as a collection of pus and air in the pleural cavity.^[1] The term is often wrongly used in much wider sense to include all phases of pleural infection from an infected turbid effusion to a mature abscess containing thick pus. It may be localised (encapsulated) or it may involve the entire pleural cavity. Pyopneumothorax 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.^[2] 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. Post-surgical pleural space infections still occur and are being treated of conservatively or aggressively with resection surgery. In India, Pyopneumothorax with pre-

existing disease is treated with antimicrobial multiple antituberculous drugs and Intercostal drainage tube or surgery.^[3] This results in long hospital stay. Many with poor status cannot be subjected to surgery, so Intercostal drainage tube with antimicrobial agents is alternatively practised. In present study, we have studied 50 cases of Pyopneumothorax considering clinical features, diagnosis and treatment.

The present study was designed to identify the prevalence of diabetes and its associated risk factors among the students and faculty members of VIT University (VITU), Vellore, India. Since VITU houses a diverse population from different parts of India, it can be considered as a representative for the prevalence of diabetes among college going adults of the entire nation. The following aims were kept in view during the study of Pyopneumothorax: (1) To know the age and sex incidence. (2) To study clinical presentation and characteristics of mode of onset. (3) To obtain relationship with smoking. (4) To emphasise the importance of radiological and

other investigations as an aid to diagnosis and management. (5) To find out the underlying lung pathology if any. (6) To decide the response to various modes of treatment. (7) To understand the complications of Pyopneumothorax.

Materials and Methods

This is a progressive study of 50 Indoor patients with pyopneumothorax admitted in the civil hospital, Ahmedabad in consecutive 3 years. Traumatic pyopneumothorax patients were excluded from the Study. The detailed history taken in all cases according to a planned performa. Besides routine investigations, pus examination for culture and sensitivity and sputum AFB, sputum culture and sensitivity for pyogenic organisms done in all cases to identify probable aetiology. The response to various modes of treatment and complications were noted.

Results

The age incidences indicate that it was high in 21-30 years of age (Table 1). The higher incidence in male may be due to bad habits (Table 2). Most common complaints were cough followed by dyspnoea and chest pain (Table 3). The most of the patients were smokers. It indicates that there is a direct relation of it with development of the disease (Table 4). The mycobacterium tuberculosis was the most common etiological factor. It indicates the prevalence the disease in country like India (Table 5). No organisms were isolated in about half of the patients from pus culture examination (Table 6). The acid fast bacilli positivity indicates the higher rate of tuberculosis in India (Table 7). The best modality of treatment was intercostal drainage by tube with antibiotic coverage (Table 8). Three patients were expired due to extensive involvement of bilateral lungs followed by acute respiratory failure (Table 9).

Table-1: Age Incidence

Age (in years)	No of Patients	%
0-10	00	00
11-20	13	26
21-30	19	38
31-40	10	20
41-50	05	10
51-60	03	06
Above 61	00	00
Total	50	100

Table-2: Sex Incidence

Sex	No of patients	%
male	43	86
female	07	14
total	50	100

Table-3: Clinical Features

Symptoms	No of Patients	%
Dyspnoea	40	80
Cough	47	94
Chest pain	35	70
Fever	24	48

Table-4: Relation with Smoking

Smoking	No of Patients	%
Smokers	28	56
Ex-smokers	8	16
Non-smokers	14	28
Total	50	100

Table-5: Aetiology

Cause	No of Patients	%
Mycobacterium tuberculosis	46	92
Post-Pneumonic	03	06
Post-Traumatic	00	00
Amoebic	01	02
Etiology Undermined	00	00
Total	50	100

Table-6: Bacteriology

Organism	No of Cases	%
Staphylococcus aureus	08	16
Pseudomonas	11	22
E Coli	06	12
Streptococcus	01	02
Enterobacteria	01	02
Klebsiella	00	00
Mixed	00	00
No Organism	23	46
Total	50	100

Table-7: Sputum for Acid Fast Bacilli

Acid Fast Bacilli	No of Patients	%
Positive	17	34
Negative	33	66
TOTAL	50	100

Table-8: Modalities of Treatment

Type of Treatment	No of Cases	%
RMP Lavage with ICD	10	20
Intercostal Drainage	38	76
Rib Resection with Drainage	00	00
Decortication	02	04
Pleurolectomy	00	00
Thoracoplasty	00	00

Table-9: Outcome of Patients

Outcome	No of Patients	%
Complete Expansion	25	50
Partial Expansion	20	40
Left against medical advice	00	00
Transferred for Thoracic Surgery	02	04
Expired	03	06
Total	50	100

Discussion

In India, incidence of pyopneumothorax common in young age group is due to tuberculosis.^[4] According to Kamat^[5] study, out of 100 patients, 29 cases had an age below 24 years and 58 were between 25-44 years. Study of R K Tandon^[6] shows that incidence of pyopneumothorax is more common in 10-40 years age group which is consistent with the present study whereas other two studies- A S Geha^[7], M M Sherman^[8] shows incidence of pyopneumothorax were higher after 40 years of age group. This may be possible due to above studies were carried out in foreign countries where incidence of Tuberculosis is slow. The incidence is exceedingly dominating in males. The percentage of male incidence of disease in different studies is as follows: R.K.Tandon et al^[6] – 75%, A.S.Geha et al^[7]– 75.6%, Kamat et al ^[5]– 88%, Emerson et al^[9]– 83.4%. In present study it was 86%. It is obvious that Males are more prone to mechanical stresses due to strenuous work smoking and tall stature, tuberculosis, chronic bronchitis with emphysema all these being more common in males.^[10]

It is evident from the present study (48%) that the disease was more common on right side. In R.K.Tandon et al^[6], it was 57.14%. This is probably due to the greater bulk of the right lung.^[11] Bilateral pneumothorax is quite an infrequent occurrence in all the series.

Dyspnoea, Cough and Chest Pain are the most common symptoms in the present series and by Kamat et al.^[5] This may be explained on the basis that tuberculosis being the most common etiology in present series. In Kamat et al^[5], 52% are smokers, while in present study, 56% patients are smokers and 10% were ex-smokers. In our series, we reported positive culture report of pus in 54% of cases. Bryant et al^[12] reported 67.8% positive cultured fluid while Sherman et al^[8] reported 66% positive report and Emerson et al^[9] 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 pyopneumothorax. Mycobacteria tuberculosis organisms do not grow

on ordinary media. Special media like Twin 90 and Dorset egg media will take six weeks to grow.^[13] In Kamat et al^[5], 57% cases were positive for sputum acid-fast bacilli. Results can be explained by higher rates of underlying tuberculosis. Intermittent aspirations with instillation of antibiotics^[14] were tried in 10 patients. It was successful in 5 patients. 1 patient expired and in 4 partial expansions occurred. Intercostal drainage^[15] was done in 38 cases. It was successful in 19 cases. Conservation treatment was effective when the disease was in exudative or fibrinopurulent stage and initiation of their before organisation and fibrosis set in.

In present series, the newer technique RMP lavage with ICD insertion^[16] was used and it gives good results. ICD was done in 76% patients. Decortication^[17] has been done in 4%. Large numbers of these cases are unsuitable for surgical therapy because of involvement of both or contra lateral lung with tuberculous pathology. In BK Khanna et al^[18], 63% of patients had complete expansion of lung. In the end, it may again be emphasised that all cases of tuberculous pyopneumothorax need hospitalisation. Closed intercostal drainage must be done immediately thereafter. Potent antitubercular drugs^[19] should be administered. The amount of pus collected in the bottle should be monitored every day. Once the amount is below 40 ml/24 hours suitable antibiotic therapy to control secondary infection should be started and the tube withdrawn and replaced by a corrugated rubber drain. The overall recovery rate in this series with ICD treatment was 50% which has profoundly affected by the presence of broncho-pleural fistula.

Conclusion

The incidence of pyopneumothorax was highest in the age group 21-30 years (38%), 84% of patients were under the age of 40. Cough, dyspnoea and chest pain were the commonest symptoms. Smoking is one of the main etiological factors. X-ray Chest was the single most important investigation. Tuberculosis is main etiology in country like India. Intercostal drainage with under water seal was the treatment of choice in most of the patients. The commonest complication following ICD was surgical emphysema.

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Cite this article as: Gupta A, Dutt N, Patel N. The different treatment modalities of pyopneumothorax – a study of 50 cases. *Int J Med Sci Public Health* 2013; 2:609-612.

Source of Support: None

Conflict of interest: None declared