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ORGANISMS ISOLATED IN EMPYEMA THORACIS

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ABSTRACT

Objective; To determine the types of organism detected in empyema thoracis and their susceptibility pattern. **Methodology;** This cross sectional study was carried out at Medical Department of Sheikh Zayed Hospital, Rahim Yar Khan during July 2017 to December 2017. In this study, the cases with empyema thoracic of any duration were selected. The cases were included irrespective of the gender and having adult range of age i.e. > 12 years. The cases having immunocompromised state or on chemotherapy were excluded. The samples obtained by pleural fluid aspiration were inoculated on Mac-conkey agar, 5% sheep blood agar and were stained for gram staining and were further processed for detection and isolation of different organisms on standard techniques. **Results;** In this study, there were total 40 cases with positive culture result with mean age of 41.23±9.77 year and mean duration of symptoms was 15.13±3.46 days. There were 60% males and 40% females. The most common organism detected was Klebsiella spp. which was observed in 12 (30%) of the cases followed by Pseudomonas aeruginosa which was observed in 9 (22.5%) of the cases. Staphylococcus aureus was see in 6 (15%) of the cases with enterobactriacae and Escherichia Coli in 10% cases each. Streptococcus Pneumonia and Proteus Mirabilis was seen in 2 (5%) cases each. **Conclusion;** The most common organism detected in empyema thoracic is Klebsiella followed by Pseudomonas aeruginosa.

KEYWORDS: Empyema thoracic, Mac-conkey agar Klebsiella spp.

INTRODUCTION

Pleural effusions are one of the most common presentations in the chest clinics and are also very common to the Physician and Medical floors. There are wide range of aetiologies leading to its development and on the basis of etio-pathophysiology it can be broadly divided into transudative and exudative effusion.[1-2]

Infections are amongst the most common underlying causes in exudative neutrophilic pleural effusions. In the more overt exudation, it can result in the pus formation called as empyema thoracis. Empirical drug therapy is the first step taken and usually cases respond to it. But in cases of resistant effusions and empyema thoracis, diagnostic aspiration is always needed. There is always a change in the spectrum of the organism detected from empyema. Gram positive bacteria were the most common ones in the last era isolated from the pleural fluids; but the trends have changed towards detection of more gram negative one with resistant strains.[3-4]

The emergence of antibiotics led to the historical statement by William H Stewart US surgeon general that "it is time to close the book of infectious diseases" (Stewart 1967). However, this was not actually true and the microbial world has shown remarkable resilience and have adopted to the changed antibiotics.[4-5]

MATERIAL AND METHODS

Objective

To determine the various types of organism detected in empyema thoracis.

Study design

Cross sectional study

Study Setting

Sheikh Zayed Hospital, Rahim Yar Khan

Study Duration

July 2017 to December 2017.

Sampling techniques

Non probability consecutive sampling

In this study, the cases with empyema thoracic of any duration were selected. The cases were included irrespective of the gender and having adult range of age i.e. > 12 years. The cases having immunocompromised state or on chemotherapy were excluded. The samples obtained by pleural fluid aspiration were inoculated on Mac-conkey agar, 5% sheep blood agar and were stained

for gram staining and were further processed for detection and isolation of different organisms on standard techniques.

Statistical analysis

The Data was entered and analyzed by using SPSS-version 23. Frequency and percentages were calculated for categorical data and mean and standard deviation for quantitative data.

RESULTS

In this study, there were total 40 cases with positive culture result with mean age of 41.23±9.77 year and mean duration of symptoms was 15.13±3.46 days. There were 60% males and 40% females in this study (Table I). The most common organism detected was Klebsiella spp. which was observed in 12 (30%) of the cases followed by Pseudomonas aeruginosa which was observed in 9 (22.5%) of the cases. Staphylococcus aureus was see in 6 (15%) of the cases with enterobactriacae and Escherichia Coli in 10% cases each. Streptococcus Pneumonia and Proteus Mirabilis was seen in 2 (5%) cases each as in table II.

Table I. Demographics.

Variable	Number	Percentage
Male	24	60%
Female	16	40%
Variable	**Mean ± SD**	**Range**
Age (years)	41.23±9.77	13-69
BMI (Kg/m^2)	25.44±6.11	18-39
Duration of symptoms (days)	15.13±3.46	3-25

Table II. Types of organism isolated.

Organism	Number	Percentage
Klebsiella spp.	12	30%
Pseudomonas aeruginosa	9	22.50%
Staphylococcus Aureus	6	15%
Escherichia Coli	4	10%
Entero-bacteriaceae	4	10%
Streptococcus Pneumonia	2	5%
Proteus Mirabilis	2	5%

DISCUSSION

Pleural effusions are empyema thoracis are amongst the very old complications associated with thoracic cavity infections and are noted form the times of Hippocrates and always posed a great concern and influenced the course of treatment. Antibiotics are the mainstay of the treatment along with drainage of the empyema. Drug therapy starts with empirical regimen and is always started according ot the data showing the patterns of organisms detected in the previous results of such cases and then is adjusted accordingly.[6]

In this study the 40 cases were selected that had a confirmed positive result on culture media and were selected out of a larger sample size of 195 cases with an overall positive culture prevalence of 20.5% of cases. The overall organism isolated from the empyema is also at slightly lower side in the previous studies. According to a very large study where 2219 cases were include for their analysis of pleural fluid and it was seen that positive results were seen in 17.3% of the cases.[7] While an Indian study also found a similar sorts of results where it was seen in 15.3% of the cases.[8] The results of these studies were drastically different from the developed world where this was seen in only 1.4% of the cases.[9]

The most common organism detected was Klebsiella spp. which was observed in 12 (30%) of the cases followed by Pseudomonas aeruginosa which was observed in 9 (22.5%) of the cases. The results of the present study were also supported by the data of multiple studies. Sonali J et al, in their study also found the gram negative bacteria as the highest isolated organism and were isolated in 88.4% of the cases and Klebsiella was the most common organism.[10] This was also seen by the other study where 84.6% of cases were gram negative and in their study Klebsiella and Pseudomonas were seen in equal number of the cases.[11]

Few of the studies revealed the mixed results and according to them were E. coli, Klebsiella spp, Pseudomonas spp, and Staph Aureus were amongst the most common organism isolated like the present study.[10-13] Sonali et al found P. aeruginosa in the most cases with an overall prevalence of 55.3% of the total isolates.[10]

CONCLUSION

The most common organism detected in empyema thoracic is Klebsiella followed by Pseudomonas aeruginosa.

REFERENCES

1. Porcel JM, P. Vázquez, M. Vives, A. Nogués, M. Falguera, A. Manonelles: Pleural Space Infections: Microbiologic and Fluid Characteristics in 84 Patients. The Internet Journal of Pulmonary Medicine, 2003; 3(1).
2. Chen KY, Hsueh PR, Liaw YS, Yang PC, Luh KT.A 10-year experience with bacteriology of acute thoracic empyema: emphasis on Klebsiella pneumoniae in patients with diabetes mellitus. Chest, 2000 Jun; 117(6): 1685-9.
3. D Raghunath.Emerging antibiotic resistance in bacteria with special reference to India: J. Biosc, 2008; 33(4): 593-603
4. Peter M. Hawkey, Annie M Jones, The changing epidemiology of resistance. Journal of antimicrobial chemotherapy, 2009; 64(1): i3-i10.

5. Robert E Siegel, Emerging Gram-Negative Antibiotic Resistance: Daunting Challenges, Declining Sensitivities, and Dire Consequences; Respiratory Care, April, 2008; 53(4); 471-9.
6. Ami Varaiya, Nikhil Kulkarni, Manasi Kulkarni, Pallavi Bhalekar & Jyotsana Dogra , Incidence of metallo beta lactamase producing Pseudomonas aeruginosa in ICU patients: Indian J Med Res 127, April 2008; 398-402.
7. Loveena Oberoi, Nachhatarjit singh, PoonamSharma, Aruna Aggarwal, ESBL, MBL and Ampc β Lactamases Producing Superbugs – Havoc in the Intensive Care Units of Punjab India: JCDR/2012/5016:2497.
8. Alfageme I, Muñoz F, Peña N, Umbría S. Empyema of the thorax in adults. Etiology, microbiologic findings, and management: Chest, 1993 Mar; 103(3): 839-43.
9. Srujana Mohanty, Arti Kapil, Bimal K Das.Bacteriology of parapneumonic pleural effusions in an Indian hospital: Trop Doct, October 2007; 37(4): 228-229.
10. Sonali J.Banavaliker JN. Empyema thoracis; bacteriological analysis of pleural fluid from the larget chest hospital in Delhi. IOSR J Dent Med Sci., 2013; 3(^): 46-51.
11. Gupta S K, Kishan J,Singh S P, Review of one hundred cases of Empyema thoracis; Indian J Chest Dis Allied Sci, 1989 JanMar; 31(1): 15-20
12. Barnes TW, Olson EJ, Morgenthaler TI, Edson RS, Decker PA, Ryu JH. Low yield of microbiologic studies on pleural fluid specimens. Chest, 2005 Mar; 127(3): 916-21.
13. Amit Banga, GC Khilnani, SK Sharma, AB Dey, Naveet Wig and Namrata Banga, A study of empyema thoracis and role of intrapleural streptokinase in its management: BMC Infectious Diseases, 2004; 4: 19.