ABSTRACT

OBJECTIVE: To assess the prevalence of Legionella pneumophila infection determined by seropositivity in patients admitted with Community Acquired Pneumonia.

STUDY DESIGN: A cross sectional Analytical study.


METHODOLOGY: Study population included 65 patients of Community Acquired Pneumonia. All patients had undergone Serological testing for Legionella Pneumonia by Enzyme Immune Assay (EIA). The blood samples were collected and sent to lab within 3 days of admission... Data included age, gender and serology results. Results were reported Positive at titre of 1:256.

RESULTS: Among total of 65 patients, male to female ratio was 1:1.5. The age range was 12-85 years; with mean age of 39.24 ± 13.37 years (SD). Among these patients admitted with Community Acquired Pneumonia 40% were found to be serologically positive for Legionella Pneumonia.

CONCLUSION: High prevalence of Legionella Pneumoniae infection was found among patients admitted with Community Acquired Pneumonia. The results obtained are not conclusive and further studies are recommended to establish the role of Legionella in Community Acquired Pneumonia in this region.

KEY WORDS: Legionella Pneumophila, Community Acquired Pneumonia, Prevalence, Enzyme Immune Assay, Seropositivity.

INTRODUCTION

Pneumonina is a common and serious ailment worldwide. It is caused by bacterial, viral, fungal or protozoal infections of lower respiratory tract. It is often acquired in community and called Community Acquired Pneumonia (CAP) but may be acquired during hospital stay of patient when it is called Hospital Acquired Pneumonia (HAP). It is a life threatening condition and needs early diagnosis and appropriate management to save life of patients. Causative agents are many. In typical pneumonia cases Streptococcus Pneumonia is most common causative agent while in atypical infections Mycoplasma Pneumonia in children and Legionella pneumophila in adults are common infective agents.

Legionella pneumophila is a relatively new entrant in list of etiological agents of atypical infections to cause CAP, first recognized in 1977. Many outbreaks of Legionella pneumophila have been reported since famous Philadelphia epidemic of Legionnaires disease in 1976. It is being increasingly recognized as prevalent organism causing sporadic individual cases of legionella pneumophila. Legionella causes two distinct clinical conditions; Legionnaires disease and Pontiac fever. The later is a mild flu-like illness that spares the lung. The disease is usually self-limited and does not require treatment.

Legionnaires disease is more serious form of infection and has high mortality in elderly patients. Legionnaires disease is a multi system disease with dominant respiratory features in form of pneumonia. Other system involvement includes gastrointestinal complaints of diarrhea and vomiting. Hyponatremia (serum sodium <130 mEq/L) is frequently found in patients with Legionella infection. Leucocytosis, thrombocytopenia and hepatic and renal dysfunction is common but non-specific. Chest x-ray commonly shows patchy unilobar infiltrates that progresses to consolidation; diffuse interstitial infiltrates may be present. Pleural effusions are not uncommon. Although certain clinical clues mentioned above suggest infection with Legionella but, none of them are specific enough to diagnose Legionella Pneumonia with confidence.

Specialized tests for Legionella are needed for all patients with CAP to confirm Legionella infection. Culturing for Legionella spp is the single most important laboratory test but requires special but availability is an issue. Urinary antigen testing is rapid, sensitive, specific, and not costly and most routinely used test in hospital setting for diagnosis of Legionella infection. Indirect fluorescent antibody (IFA) and enzyme-linked immunosorbent assays (ELISA) are the most commonly performed tests for Legionella serology but they have become less important in diagnosis of individual clinical cases with discovery of urinary
antigen testing but are still employed in an epidemiological study. However, a single elevated titer (1:256) may indicate the presence of acute disease if seroprevalence of Legionella in particular community is known to be low. Despite availability of these specific tests Legionella Pneumophila is still not being considered, fully diagnosed and reported in many Asian countries including Pakistan. There has been lot of work and studies done worldwide but there are relatively few studies of legionella pneumophila prevalence in Asia. Legionella Pneumophila has been diagnosed often in Pakistan on clinical basis only because of scarcity of facilities for microbial detection of legionella pneumophila. And is usually undiagnosed or there is delay in diagnosis resulting in high morbidity and mortality in CAP patients. This study is conducted to determine true prevalence of Legionella Pneumophila in CAP in Northern Punjab region of Pakistan. The knowledge of true prevalence of Legionella Pneumophila infection in CAP patients will guide physicians to consider, diagnose and appropriately treat the patients accordingly. This will help in reducing morbidity and mortality due to this serious and life threatening condition.

METHODOLOGY

It was a cross sectional analytical study conducted at Chest Diseases Unit, Fauji Foundation Hospital, Rawalpindi in patients admitted with Community Acquired Pneumophila from December 1st, 2002 to February 28th, 2003. Community Acquired Pneumophila was diagnosed on the basis of clinical presentation which included acute onset fever, cough, sputum production and breathlessness. All patients had Chest X ray done and those with chest x-ray showing new infiltrates were included in the study. All patients had sputum smear study for AFB done. The patients who had infiltrates on Chest X ray but were smear positive for AFB were excluded. Also patients with diagnosed Lung malignancy were excluded. Serology for Legionella Pneumophila by EIA was performed on all patients. Blood samples were collected within 3 days of admission and were sent to Referral Laboratory of AFIP, Rawalpindi. The results were reported back as Positive or Negative on the basis of titre cut off point of 1:256.

Data Analysis:
Statistical package for social sciences (SPSS-18.0) was used to analyze data. Frequency and percentage were computed for categorical variables like gender and incidence of Legionella Pneumophila seropositivity.

RESULTS

Out of sixty five patients admitted with CAP, 26 (40%) were male and 39 (60%) were female. EIA (Enzyme Immune Assay) was performed to assess the prevalence of Legionella infection. 26 patients (40%) were found to be serologically positive for Legionella infection and 39 (60%) were found to be negative as shown in Figure-1. Gender wise distribution of Positive and negative cases is shown in Figure-2. Among total 26 male patients, 9 (35%) were positive and 17(65%) were negative. Age wise distribution of positive and negative cases is shown in fig III. In age group under 20, among total 10 patients, 6 (60%) were seronegative while 4(40%) were seropositive. In age group 21-40, among total 8 patients, 5(62.5%) Were seronegative and 3(37.5%) were seropositive. In age group 41-60 years, among total 26 patients, 13(50%) were seronegative and 13(50%) were seropositive, In age group above 60 years, among total 21 patients, 17(81%) were seronegative and 4(19%) were seropositive.
DISCUSSION

Although streptococcus remained the most common aetiological agent in community acquired pneumonia, atypical bacteria have been increasingly recognized as a cause of CAP in Pakistan in last decade. Incidence of Legionella in community varies from 2 to 27% according to seasonal and geographical variations in different studies. A large multicenter Asian study reported 6.6% incidence of legionella pneumophila in 1374 CAP cases and positive serology in 18.9%.[1] This is interesting to note that while only 6.6% were confirmed to have Legionella Pneumophila, Seropositivity for Legionella was 18.9%. Our study has shown Seropositivity of 40%, a much higher figure but our study sample was small (65 vs. 1374) and patients had severe disease A study in Japan described 28 cases of culture positive Legionella Pneumophila infection.[2] (64%) were community acquired and 10 (36%) were nosocomial.[3] A Taiwan study also reported high prevalence of sero-positivity for Legionella Pneumophila in children, 28.4 to 35% among 180 children cases of CAP, while no confirmed cases was seen.[4] This study has shown Seropositivity prevalence similar to our study.

An Indian study showed that 31 cases out of 113 cases of CAP were sero-positive (27.43% seropositivity) for Legionella Pneumophila.[5] This Indian study is also consistent with overall prevalence of Seropositivity for Legionella in Indian subcontinent.

Legionella is water born organism commonly present in streams and lakes, but human made reservoir such as potable water tanks, cooling plants and decorative fountains, act as amplifier of growth and proliferation of the organisms and have been implicated in transmission of legionella. Factors known to increase growth are warm temperature (25 to 42°C) and stagnation. The presence of amoebae and protozoa further enhances colonization.[6] Area has shortage of water supply so every house uses storage tank for potable water. Use of geysers and water cooler is also a common practice providing ideal environment for Legionella. Increased precipitation and humidity also results in increased incidence of Legionella infection.[7] All these weather patterns go with climate of northern areas of Punjab which receives lot of rain in monsoon season and has hot and humid environment in summer season. Similar changing weather patterns and increased rainfall has also been suggested in increased incidence in recent studies in England and USA.[8,9] Besides these environmental predispositions, Legionella has been associated with travelling and hospital stay but main factor remains the contamination of water sources. Older studies have shown increased rate of Legionella infection in older individuals with underlying chronic lung disease and other medical problems, recent studies showed disease occurrence in young individuals with no significant medical history.[10] Our study also showed high prevalence of Legionella in younger and middle aged groups with no co-morbidities.

CONCLUSION

Our study has shown high prevalence of Seropositivity for Legionella Pneumonae infection in patients with Community Acquired Pneumophila. This suggests that Legionella Pneumophila should be considered high in differential diagnosis of patients presenting with Community Acquired Pneumophila. Recommendations. Further studies at larger scale are needed to establish the role of Legionella Pneumophila as causative agent in CAP in this region.

Author Contribution:

Dr. Muhammad Saeed Khan: Planned and designed the study, collected the data and supervised writing of manuscript

Dr. Jahanzeb Maqsood: Assistance in collection of data and writing of manuscript.

Dr. Muhammad Ashraf: Contributed in writing of manuscript.

Dr. Tayyaba Ijaz: Contributed towards Lab result discussion.

REFERENCES


