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RESPIRATORY TRACT INFECTION BY STREPTOCOCCUS *PNEUMONIAE* IN THE COLD CLIMATIC REGIONS OF WAYANAD DISTRICT IN KERALA

Reshma K	Department of Medical Microbiology, School of Health Sciences,Thalassery, Kannur.
Linda Rose Jose	Department of Microbiology, DM IMS Medical College, Meppadi, Wayanad
Gogi suresh	Department of Microbiology, DM IMS Medical College, Meppadi, Wayanad
Deepthy B. J*	Department of Microbiology, DM IMS Medical College, Meppadi, Wayanad *Corresponding Author

ABSTRACT **Background:** Respiratory tract infection (RTI) is a major health problem in developing countries. The incidence of these infections increases in temperate climates during the colder months of the year. The study aim that to analyze the etiology of respiratory infection in cold climatic regions of wayanad, Kerala.

Methods: A prospective study was conducted among all age group patients in Microbiology DM WIMS Medical College, Meppadi, Wayanad, during three month period (May to July 2019.). Prevalence of RTIs was studied by isolating and identifying the etiological agents from appropriate samples collected from patients. The maximum number of samples were collected during the heavy rainy seasons of June and July months.

Result: A total of 125 samples were studied, which included Throat swab, sputum, bronchial wash and broncho- alveolar lavage. Out of the 125 samples processed 68 samples showed growth of respiratory pathogens like *Streptococcus pneumoniae, staphylococcus aureus, Klebsiella pneumonia and pseudomonas aeruginosa*. Infection rate was noted more among patients in old age group with weak immune status. Streptococcus pneumoniae was predominant bacteria isolated. Most of the infections were in male patients than in females.

Conclusion: Temperature is related to prevalence of RTIs in developing society. The data available suggest that exposure to cold, either through exposure to low environmental temperatures , increases the risk of developing upper and lower respiratory tract infections; in addition, the longer the duration of exposure the higher the risk of infection. The effect of temperature on health varies between different age groups.

KEYWORDS : Respiratory tract infections, Streptococcus pneumonia, Staphylococcus aureus, Pharyngitis .

INTRODUCTION

Respiratory tract infections (RTI) are one of the most frequently encountered diseases and common infection in community & hospital settings (1). Upper respiratory tract infection and lower Respiratory tract infections are common in worldwide. It has long been observed that the incidence of these infections increases in temperate climates during the colder months of the year (2). Common cold, pharyngitis, laryngitis, croup, otitis of viral etiology, sinusitis, acute bronchitis, viral exacerbations of chronic bronchitis, bronchiolitis and community acquired pneumonia all occur with peak incidence during low temperature(1). RTI can be caused by many kinds of microorganisms including bacteria, viruses, or fungi.

METHODS AND MATERIALS:

The present study was conducted in the Department of Microbiology DM WIMS Medical College, Meppadi, Wayanad, during three month period (May to July2019) to evaluate the etiology of respiratory tract infection in cold climatic regions of wayanad. A total of 125 clinical (sputum, bronchial wash, throat swab, and nasal swab) samples from patient of all age groups received in the microbiology lab for routine examination and culture.

All samples were processed by standard microbiological operating procedure for isolation and identification of microorganism following the manual of clinical microbiology (3). Samples were inoculated in routine culture media (blood agar, MacConkey agar, and chocolate agar) and subjected o microscopic examination as Gram's stained preparation and the growth from culture plates were tested in biochemical media for identification of bacteria (3).and the sample were also proceed to isolate fungus.

RESULT

A total of 125 clinical samples (sputum, bronchial wash, throat swab, and nasal swab) received during the study period out of which 68 (54.4%) samples showed the growth of significant bacterial isolates **(table1).** Among the total 68 bacterial isolates, 12 (17.64%) were *S. pnemoniae*, which is considered as a significant pathogen causing community Respiratory infections. The major bacterial isolate identified was pseudomonas aeruginosa, 15 (22.05%) isolates which was followed by 11 (16.7%) *K. pneumoniae*, 8 (11.8%) *E. coli*, 7 (10.3%) *S. aureus*, 6 Acinetobactor (8.82%) and 3 (4.4%) *H. influenzae.*

Bacterial Growth	No of isolates	%
Streptococcus pyogenes	6	8.82
Streptococcus pneumonia	12	17.64
Staphylococcus aureus	7	10.3
Klebsiella pneumoniae	11	16.17
Pseudomonas aeruginosa	15	22.05
E.Coli	8	11.8
Acinetobactor	6	8.82
Haemophilus influezae	3	4.4
Total	68	100

Table No. 2: The drug sensitive and resistant for S. pneumoniae

Antibiotic used	Sensitive (N=12) %	Resistant (N=12) %
Amikacin	25 (3)	64.3 (9)
Amoxicyclav	50(6)	50 (6)
Ampicilin	41.6 (5)	58.3 (7)
Cefotaxime	50(6)	50 (6)
Ceftazidime	91.66(11)	8.3 (1)
Cefuroxime	75 (9)	16.7 (2)
Ciprofloxacin	91.66 (11)	8.3 (1)
Co-trimoxazole	0.00	91.66 (11)
Erythromycin	91.6 (11)	8.3 (1)
Vancomicin	91.6 (11)	8.3 (1)
Gentamicin	8.3 (1)	91.6 (11)
Bacitracin	0.00	91.6(11)

In this study age group 56-75 years was more susceptible to RTIs, which may due to weakened immune system. There were 38(61.3%) males and 24 (38.7%) females among the infected population.

DISCUSSION

In this study, out of 125 respiratory samples 68 are showed growth on culture. Among the total 68 bacterial isolates, *S.pnemoniae was* found to be the most predominant organism causing respiratory infection in cold climate, followed by, *K.pneumoniae* (16.17%), *E. coli* (11.8%), *S. aureus*(10.3%), S. pyogenes (8.82%), Acinetobactor(8.82%) and *H. influenzae* (4.4%). Pseudomonas was a major isolate but it was identified as hospital acquired pathogen.

In our study there were intermixing of hospital acquired &community acquired RTI cases. Pneumonia and other RTIs were the frequent

complication in patient admitted in hospital, predominantly multidrug resistance GNB such as *Pseudomonas aeruginosa, Klebsiella pneumonia, E coli*. In this study observed that infection rate higher in male than female. Above 60 aged groups are more susceptible to RTIs. This observation is similar to the findings of study conducted by Akca et.al. (3) and Vijayanarayana et.al (4). Increasing incidence of RTIs in old age may be due to less effective immune system or underlying degenerative disease such as diabetes mellitus, emphysema, (5). Increasing resistance to antibiotic by respiratory pathogen has complicated the use of empirical treatment with traditional agents & a definitive bacteriological diagnosis & susceptibility testing would, therefore, be required for effective management of lower respiratory tract infection (6).

CONCLUSION:

This study was aimed to establishing the etiology of respiratory infection in people living in colder climate. It is clear that Respiratory infection increasing in colder climate compared to other season. According to our study Streptococcus pneumoniae was the most common organism isolated and *Pseudomonas aeruginosa* was anoher common organism isolated as hospital acquired strain because it was reported as secondary infection in many of the admissions. Another notable fact is Pseudomonas aeruginosa is acquiring the ability to adapt to hospital environments rapidly than other pathogen. RTIs are mainly affecting older age peoples because of low immunity. Male patients are more susceptible than female patients; the higher incidence in males may be due to alcoholism and smoking.

REFERENCES

1. Yu Liu,1,2,† Yong Guo,1,2,† Changbing Wang,3 Weidong Li,1,2 Jinhua Lu,1,2 Songying Shen,1Huimin Xia,1 Jianrong He,1,2 and Xiu Qiu1,2,* Association between Temperature Change and Outpatient Visits for Respiratory Tract Infections among Children in Guangzhou, China Int J Environ Res Public Health. 2015 Jan; 12(1): 439–454.
2. E. G. Mourtzoukou,* M. E. Falagas*† Exposure to cold and respiratory tract infections 200 Versalovic J, et.al. Manual of clinical microbiology. 10th ed. Washinon, DC: American Society of Microbiology;2011
3. Akça, O, Koltka, K, Uzel, S, Çakar, N, Pembeci, K, Sayan, MA, Tütüncü, AS, Karakas, SE,Çalangu, S & Özkan, T 2000, 'Risk factors for early-onset, ventilator-associated pneumonia in critical care patients: selected multiresistant versus nonresistant bacteria',Anesthesiology, vol. 93, no. 3, pp. 638-645.
4. Vijayanarayana K, Rau NR . Analysis of risk factor, antibiotic resissance & usage pattern in hospital acquired pneumonia-23-07-2014.
5. Macfarlane JT, Colville A, Guion A, Macfarlane RM, Rose DH.(1993). Prospective study of etiology & outcome of adult LRTIs in the community; 341:511-514.
6. Anderson H, Esmail A, Hollowell J, Littlejohns P, Strachen D.(1993). Epidemiologically based needs assessment: lower respiratory disease. DHA Project Research Programme: pp 6-12.