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Original Research Paper

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BACTERIOLOGICAL PROFILE AND ANTIBIOGRAM OF LOWER RESPIRATORY TRACT INFECTIONS IN A TERTIARY CARE HOSPITAL.

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ABSTRACT

Aims: The present study was conducted to determine the bacterial aetiology and antimicrobial susceptibility pattern of lower respiratory tract infections so as to update the clinicians in various antimicrobial alternatives available in the treatment.

Methods: 177 sputum samples from patients with lower respiratory tract infections were collected in time span of 3months. Bacterial pathogens were isolated from sputum specimens and subjected to antibiotic susceptibility testing using standard bacteriologic techniques.

Results: Out of 177 cases only 46 (26%) had an established aetiology. Males 102 (57.6%) were more commonly affected than Females 75(42.4%) .The most prevalent bacterial pathogen was Klebsiella pneumoniae 37(80.4%) followed by Pseudomonas aeuroginosa 6(13%) and Acinetobacter spp. 3(6.6%).Klebsiella pneumoniae was most sensitive to Amikacin, Ciprofloxacin and Gentamycin and resistant to Doxycycline. Pseudomonas aeuroginosa was sensitive to Meropenem, Tobramycin and Ceftazidime. Acinetobacter spp. showed maximum sensitivity to Ciprofloxacin, Ofloxacin and Ceftriaxone and resistant to Cotrimoxazole and Doxycycline.

Conclusion: For the effective management of lower respiratory tract infections bacteriological diagnosis and antimicrobial susceptibility pattern is indispensable.

KEYWORDS : Lower respiratory tract infections, Klebsiella pneumoniae, Pseudomonas aeuroginosa, Acinetobacter spp

Introduction:

Respiratory tract infection is one of the most important infectious diseases worldwide. This infection is the leading cause of morbidity and mortality in critically ill patients in developing countries.[1]

In India acute lower respiratory tract infection is responsible for one million deaths [2] but there is inadequate information on various bacterial pathogens causing these infections. The emergence of resistance as a major problem has drawn attention to need for better diagnostic techniques and newer drugs to allow for more specific therapy.

Hence , the present study was undertaken to define the common bacterial profile in lower respiratory tract infection and to study their antibiotic susceptibility pattern.

Aims and Objectives:

1) To identify the bacterial pathogens causing lower respiratory tract infections.
2) To determine their antibiotic susceptibility pattern.

Materials and Methods:

This study, ˝ Bacteriological Profile and Antibiogram pattern of Lower Respiratory Tract Infections˝ was a prospective study conducted in the Department of Microbiology , in a tertiary care hospital in Coimbatore.

Study Period: August 2014 to October 2014.
Study group: Total number of cases studied :177

Specimen collection and processing:

The sputum samples were collected into a sterile wide mouthed container and transported to the laboratory according to standard protocols.[3] The sputum samples were then inoculated onto Blood agar plate, Mac Conkey agar plate and Chocolate agar plate. After 18-24 hrs of incubation, plates were examined for colony characteristics and further identification of bacterial isolates were done by biochemical tests.[4]

The antibiotic sensitivity was performed by Kirby Bauer disc diffusion method as recommended by CLSI guidelines.[5] The antibiotic discs used were Amikacin, Gentamycin, Ciprofloxacin, Ofloxacin, Ceftriaxone, Cotrimoxazole, Doxycycline, Meropenem, Tobramycin, Cefoperazone-Sulbactum, Piperacillin-Tazobactum, Ceftazidime. The antibiogram of each confirmed isolate was studied and the susceptibility results were compiled.

RESULTS:

Out of 177 patients presented clinically as LRTIs , aetiological diagnosis was possible only in 46 cases (26%).The maximum number of cases were males 102 (57.6%) and females constituted 75(42.4%).

Table 1: Prevalence of Culture positive cases of LRTI s

S.No.	Culture	No. of cases	Percentage
1.	Positive	46	(26%)
2.	Negative	131	(74%)
	Total	177	(100%)

The commonest organism isolated was Klebsiella pneumoniae 37(80.4%). The other organisms isolated were Pseudomonas aeroginosa 6(13%) and Acinetobacter spp. 3(6.6%)

Table 2: Distribution of Organisms in LRTI cases

S.No	Organism	No. of cases	Percentage
1.	Klebsiella pneumoniae	37	(80.4%)
2.	Pseudomonas aeruginosa	6	(13.0%)
3.	Acinetobacter spp.	3	(6.6%)
	Total	46	(100%)

The antibiotic sensitivity pattern of Klebsiella pneumoniae showed 100% sensitivity to Amikacin, 81.1% sensitivity to Ciprofloxacin, 78.4% sensitivity to Gentamycin, 62.2% sensitivity to Ofloxacin, 56.8% sensitivity to Ceftriaxone and 51.4% sensitive to Cotrimoxazole. Klebsiella pneumoniae showed maximum resistance to Doxycycline (59.5%).

The antibiotic sensitivity pattern of Pseudomonas aeroginosa

showed 100% sensitive to Meropenem, Tobramycin and Ceftazidime and 83.3% sensitive to Cefoperazone-Sulbactum and Piperacillin-Tazobactum and 66.7% sensitivity to Amikacin, Gentamycin , Ciprofloxacin and Ofloxacin.

The antibiotic sensitivity pattern of Acinetobacter spp. showed 100% sensitivity to Ciprofloxacin, Ofloxacin and Ceftriaxone and 66.7% sensitivity to Amikacin and Gentamycin. It showed 100% resistance to Cotrimoxazole and Doxycycline.

DISCUSSION:

Among 177 patients with clinically diagnosed LRTI s, 46 cases showed positive growth (26%) . In this study , LRTI s was more common in males (57.6%) when compared to females (42.4%).This was similar to a study conducted by Preeti Srivatsava et al [2] in 2013 and Supriya Panda et al [7] in 2013.This is due to more prevalent associated risk factors (eg. Smoking, Chronic alcoholism, COPD) in males in India.

Klebsiella pneumoniae (80.4%) was most commonly isolated followed by Pseudomonas aeroginosa (13%) and Acinetobacter spp. (6.6%). The results were consistent with the studies conducted by K.V.Ramana et al [6] in 2013 and A.O. Okesola et al [8] in 2008.

Klebsiella pneumoniae was most sensitive to Amikacin (100%), Ciprofloxacin (81.1%) and Gentamycin (78.4%). The resistance was maximum to Doxycycline (59.5%).

Pseudomonas aeroginosa showed maximum sensitivity to Meropenem (100%), Tobramycin (100%) and Ceftazidime (100%) and 83.3% sensitive to Cefoperazone -Sulbactum.

Acinetobacter spp. showed maximum sensitivity to Ciprofloxacin (100%), Ofloxacin (100%) and Ceftriaxone (100%). It showed 100% resistance to Cotrimoxazole and Doxycycline.

CONCLUSION:

In the present study, the total growth obtained was 26% and males were more commonly affected than females. Klebsiella pneumoniae was the commonest organism isolated and was sensitive to Amikacin, Ciprofloxacin and Gentamycin and most resistant to Doxycycline. Pseudomonas aeroginosa was the next isolated organism and showed maximum sensitivity to Meropenem, Tobramycin and Ceftazidime. Acinetobacter spp. was the least isolated and was most sensitive to Ciprofloxacin, Ofloxacin, and Ceftriaxone and resistant to Cotrimoxazole and Doxycycline. For effective management of LRTI s, bacteriological diagnosis and antimicrobial susceptibility pattern is essential to prevent the emergence of resistant strains.

REFERENCES:

1) K.Kousalya, S.Thirumurugu ,D.C. Arumainayagam, R.Manavalan, J.Vasantha and C. Uma Maheswara Reddy, Antimicrobial resistance of bacterial agents of upper respiratory tract in South Indian population, J. Adv. Pharm Technolo. Resi 2010 April-June; 1(2),207-215.
2) Preeti Srivatsava, Pappu Kumar, P.S.Nirwan, Meeta Sharma, Bacteriological Profile and Antibiogram of Lower Respiratory tract infections in a tertiary care hospital in Northern India, International Journal of Pharmaceutical research and Bioscience,2013, Vol 2 (3): 225-233.
3) J.G. Collee, A.G.Fraser, B.P. Marmion and A.Simmons, Mackie and Mac Cartney Practical Medical Microbiology; 14 th Edition, Chapter-4; 62-66.
4) Betty A Forbes, Daniel F Sahm and Alice S. Weissfeld, Bailey and Scotts Diagnostic Microbioogy, 11 th edition, Chapter -18, 260-283.
5) Clinical and Laboratory Standard Institute Performance Standards for Antimicrobial susceptibility testing, 23 rd Informational supplement; M 100-23 ,Vol 33.
6) K.V.Ramana, Anand Kalaskar, Mohan Rao, Sanjeev D Rao, Aetiology and Antimicrobial susceptibility patterns of LRTI s in a tertiary care teaching Hospital at Karimnagar, South India, American Journal of Infectious Diseases and Microbiology,2013, Vol. 1, No. 5, 101-105.
7) Supriya Panda, B.Prema Nandini, T.V. Ramani, Lower Respiratory Tract Infection-Bacteriological profile and Antibiogram pattern, Int. Journal Curl Res. Rev, Nov. 2012.Vol 4(21). Page -149-155.
8) A.O.Okesola and OM Ige, Trends in Bacteriological pathogens of lower respiratory tract infections, Indian Journal of Chest Disease and allied Science, 2008, 50 , Page 269-72.