Original Research Article

Prescription pattern of antibiotics in respiratory disorders in a tertiary care teaching hospital in Eastern part of India

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ABSTRACT

Background: Respiratory infections are increasing globally with parallel increase in world population, pollution, urbanization, overcrowding, global warming and poverty. Multi drug resistant virulent bacteria are growing very rapidly. The objective of this study was to know the prescribing pattern of antibiotics in hospitalized patients suffering from different common respiratory disorders.
Methods: This was a retrospective and observational study. Data was captured from 1st January 2016 to 31st December 2016 at ICARE Institute of Medical Sciences and Research and Dr. B.C.Roy Hospital. Total 200 patients were taken for the study of age range from 10 to 50 years.
Results: COPD, bronchial asthma, pneumonia and ARIs were the most frequent respiratory illnesses among patients attended Medicine OPD. Most common antibiotics prescribed were co-amoxyclav, ceftriaxone, moxifloxacin, clarithromycin, azithromycin and aminoglycosides.
Conclusions: Injudicious use of antibiotics in trivial viral respiratory infections may give rise to antibiotic resistant strains in the community.

Keywords: Antibiotics, Antibiotic resistance, Prescription pattern, Respiratory diseases

INTRODUCTION

Respiratory infections are increasing globally with parallel increase in world population, pollution, urbanization, overcrowding, global warming and poverty. Multi drug resistant virulent bacteria are growing very rapidly. On the contrary to fight against them very few new antibiotics have come up in recent years. So there is a gross discrepancy between the problem and their solution. Among respiratory illnesses COPD is the third leading cause of death and affects more than 10 million persons in the United States. COPD is also a disease of increasing public health importance around the world.[1] .An estimated 2.2 million people worldwide die yearly because of acute respiratory infections.[2]

The preferred treatment for all patients with persistent asthma is daily inhaled corticosteroid therapy as monotherapy or in combination with adjunctive therapy.[3]

Sometimes antibiotics are required particularly in acute exacerbations. Majority of ARIs are of viral aetiology, but prescribing antimicrobials for these illnesses is a common phenomenon. Because of the commonness of the problem, antimicrobial therapy for ARIs is major predictor for the spread of resistant strains of microbes in the community.[4] Haldia is an industrial area where environmental pollution is high; so respiratory illnesses are more common here. Both rural and urban patients come to our hospital for treatment.

METHODS

A total of 200 cases were enrolled for the study of which 119 were male and 81 were female. Age range of the patients was 10 years to 50 years. This retrospective and observational study was conducted in patients at general medicine and paediatric medicine departments of ICARE Institute of Medical Sciences and Research and DR B.C. ROY Hospital, Haldia, Purba Medinipur, West Bengal, during the period from January 2016 to December 2016. Patients with respiratory disorders like chronic obstructive pulmonary disease (COPD), bronchial asthma, pneumonia and acute respiratory infections like common cold, pharyngitis, tonsillitis, bronchitis, otitis media etc. were included. Details of the demographic profiles like sex, age, socioeconomic status were encountered. Complete drug details like dosage, frequency and duration were noted and analyzed. Common symptoms of respiratory infection are fever, cough and cold, running nose, pain at the throat, ear pain and breathlessness.

Exclusion criteria

- Age below 10 years and above 50 years
- Prescription without any antibiotic
- Patient getting anti tubercular drugs.

RESULTS

In our present study the ratio of male:female was 59:40. Mean age was 26 years with the range from 10 years to 50 years. History of smoker 110 (55%), non-smoker 90 (45%). Patients were diagnosed as COPD in 80 (40%) cases, bronchial asthma in 55 (27.5%) cases, pneumonia in 20 (10%) cases and ARI in 45 (22.5%) cases (Table 1). Common co-morbid conditions were diabetes mellitus, systemic hypertension, ischemic heart disease and hypothyroidism.

From this table it is evident that in adolescent period bronchial asthma 8 cases 4% and acute respiratory infection like acute tonsillitis 9 cases (4.5%) are common. But as age advances COPD takes the upper hand with a maximum of 47 cases (23.5%) in male and 33 cases (16.5%) in female. Environmental factors and smoking are mainly related to this increase in COPD cases.
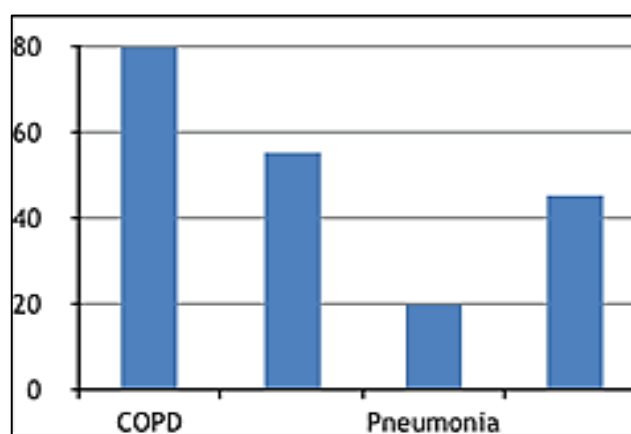

Figure 1: Patterns of different respiratory disease conditions in the study participants

Table 1: Age, sex and disease distribution of patients.

Age	Sex	COPD		Bronchial asthma		Pneumonia		ARI	
		cases	%	cases	%	cases	%	cases	%
Adolescent (10 to 18 Years)	Male	0	0	8	4	2	1	9	4.5
	Female	0	0	6	3	3	1.5	7	3.5
Adult (19 to 50 Years)	Male	47	23.5	28	14	9	4.5	16	8
	Female	33	16.5	13	6.5	6	3	13	6.5
Total		80		55		20		45	

Table 2: Prescriptions of antibiotics in the study participants.

Antibiotics	COPD		Bronchial asthma		Pneumonia		ARI		Total
	Cases	%	Cases	%	Cases	%	Cases	%	
Co-amoxyclav	30	37.5	15	27.20	5	25.00	18	40.00	68
Cephalosporin	11	13.75	12	21.80	5	25.00	10	22.22	38
Moxifloxacin	10	12.50	10	18.18	4	20.00	3	6.66	27
Clarithromycin	10	12.55	6	10.90	3	15.00	7	15.55	26
Azithromycin	14	17.5	5	9.09	2	10.00	5	11.11	26
Aminoglycosides	5	6.25	7	12.72	1	5.00	2	4.44	15

In present study most frequently used antibiotic was co-amoxyclav (68) followed by cephalosporin (38) Fluoroquinolones like moxifloxacin were used in 27 cases, clarithromycin in 26, azithromycin in 26 and aminoglycosides in 15 cases. Common side effects of antibiotic therapy were nausea, vomiting, loose motions, pain abdomen, oral ulcer, skin rashes and vertigo.
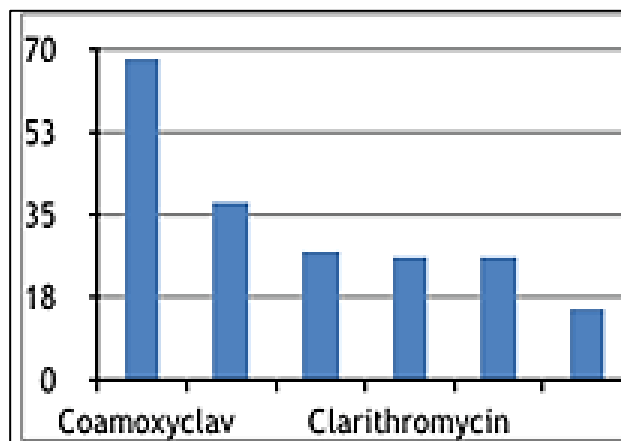

Figure 2: Patterns of different antibiotics usages in the study participants.

DISCUSSION

In our study the commonest diagnosis was COPD. Lower socioeconomic classes from both urban and rural areas are the sufferers. Industrial pollution is very high in and around Haldia. Upto 25% of exacerbations in COPD are produced by viruses. Major bacterial organisms associated with exacerbations include streptococcus pneumoniae, moraxella catarrhalis and haemophilus influenzae, mycoplasma pneumoniae or Chlamydia pneumonie.[5] Bronchial asthma is also very common. Awinash pandey et al in Gorakhpur district of India observed use of multiple drug therapy (81%) in significant number of patients as compared to single drug therapy (19%) and use of oral dosage from (56.3%) more commonly in comparison to inhalation from in the management of bronchial asthma (33.8).[6] Shimpi et al concluded that 76% asthma cases were treated with combination therapy and in all therapies methylxanthines were the drug of choice for asthmatic patients due to their lower cost.[7] The most commonly prescribed combination therapy was budesonide and formetorol followed by ipratromium bromide and salbutamol and salmetorol and fluticasone in their study.[8] Montelukast and pantoprazole are used commonly. For the treatment of co-morbid conditions anti diabetics, diuretics, antiplatelet drugs and statins were used in the present study. Higher rate of antimicrobial prescription was observed in adolescent period. Socio economic status of the parents significantly influenced the antimicrobial prescribing of physicians. Patients of the high income group and using their own conveyance received higher rate of antimicrobial prescriptions compared to those who depended on free medications. Surveillance of antibiotic use in New Delhi has shown a high use of fluoroquinolones and markedly increasing use of cephalosporins.[9] The use of fluoroquinolones brings to the fact that although concerns remain regarding the adverse musculoskeletal effects of fluoroquinolones in children, their use in the pediatric population has increased in many circumstances. Pediatricians should be aware of the indications and adverse effects of fluoroquinolones. In addition, fluoroquinolones may be particularly helpful in treating multidrug-resistant infections that have not responded to standard antibiotic therapy in immuno-compromised patients. Ciprofloxacin, as one of the frequently prescribed fluoroquinolones, deserves continued monitoring. Moreover, a habit of recording adverse drug reaction must be also encouraged at all level of health care institution.[10]

When treating infections, healthcare providers realize the importance of initiating antibiotic therapy as soon as possible. It is also recognized that tailoring pharmacologic therapy to the organism(s) responsible for the infection is equally important. When initiating therapy, standard of care calls for the use of broad-spectrum antibiotics to cover the organisms usually associated with the infection being treated. Therapy is streamlined after cultures and sensitivities are available. Delaying therapy when infectious processes are suspected is not an option, but similarly, obtaining adequate cultures before administering antibiotics is equally important. In these situations, timing is a key. Obtaining appropriate cultures before initiating antimicrobial therapy plays an important role in patient care.[10]

The foremost challenges in prescription of antibiotics are thus to achieve a rational choice and appropriate use of antibiotics and to recognize their potential problems. Physicians must also keep a clear understanding of need for microbiological diagnosis, use of antibiotics and make good judgment in clinical situations.[11] Irrational use of antimicrobials is a key factor behind rapidly spreading antimicrobial resistance in microorganisms.[12]

Limitations of present study and implications was study had certain limitations. It was a small sample sized cross sectional study. Study was conducted only for a short period at a single centre with a small sample size. Thus the results cannot be a representative of national data. Further studies should try to overcome these limitations. Antibiotic policy in these government tertiary care set-ups also depends upon the availability of drugs from the government supply.

CONCLUSION

Study clearly shows overuse and inappropriate choice of antibiotics for the treatment of acute, uncomplicated RTIs which are mainly due to virus and do not require antibiotic treatment. Results of the study warrant interventional strategies to promote rational use of antibiotics to decrease the overgrowing threat of

antibiotic resistance. Minimizing inappropriate antibiotic use is thus the best way to control resistance. Monitoring and control of antibiotic use is of growing concern and strict antibiotic policies are warranted. Furthermore, hospitals should implement uniform antibiotic prescription policies based on antibiotic sensitivity pattern.

REFERENCES

1. Kasper, Fauci, Hauser, Longo, Jameson, Loscalzo. Harrison's principles of internal medicine, 19th Edn, Ch 314; 2015:1700.
2. Dawadi S, Rao BS, Khan GM. Pattern of antimicrobial prescription and its cost analysis in respiratory tract infections. Kathmandu university. J Sci, Eng Tech. 2005;1(1):1-9.
3. Kleigman, Stanton, St. Geme. Schor. Nelson text book of pediatrics, Elsevier. 2015;Vol-1:1107.
4. S KI, Chandy SJ, Jeyaseelan L, Kumar R, Suresh S. Antimicrobial prescription patterns for common acute infections in some rural and urban health facilities of India. Indian J Med Res. 2008;128(2):165-71.
5. Munjal YP. API Textbook of Medicine, 9th Edn, Jaypee Brothers Medical Publishers (P) Ltd. Vol-2; 2012:1717.
6. Pandey A, Tripathi P, Pandey RD. Prescription pattern in asthma therapy at Gorakhpur hospitals. Lung India. 2010;27(1):8-10.
7. Shimpi RD, Salunkhe PS, Bavaskar SR, Laddha GP, Kalam AA, Patel K, et al. Drug utilization evaluation and prescription monitoring in asthmatic patients. Internat J Pharma Biol Sci. 2012;2(1):117-22.
8. Thamby SA, JulingP, Wan Xim BT, Chooi Jing N. Retrospective studies on drug utilisation patterns of asthmatics in a government hospital in Kedan, Malaysia. Internat Curr Pharma J. 2012;1(11):353-60.
9. Kotwani A, Holloway K. Antibiotic prescribing practice for acute, uncomplicated respiratory tract infections in primary care settings in New Delhi, India. Trop Med Int Health. 2014;19(7):761-8.
10. Mukherjee S, Sen S, Era N, Biswas A, Datta K, Tripathi SK. Antibiotic usage pattern among inpatients of a paediatric ward in a tertiary care hospital in Eastern India. Int J Res Med Sci. 2015;3:3681-6.
11. Straand J, Rokstad K, Heggedal U. Drug prescribing for children in general practice. A report from the More and Romsdal Study. Acta Paediatr. 1998;87:218-24.
12. Sharma R, Chopra VS, Kour G. Use of antibiotics for respiratory illness in rural India. J Clin Diagn Res. 2009;3:1157-61.