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Research Paper

A study on prescribing patterns of antibiotics for upper respiratory tract infections by general practitioners in rural areas of Assam.

Medical Science

KEYWORDS : URTI, Antibiotic, Prescription, Rural area

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ABSTRACT

Aim: To understand the prescribing pattern of antibiotics as well other drugs in the treatment of Upper respiratory tract infections (URTIs) by the general practitioners. Materials and method: This was an observational study conducted in community level i.e. in the rural areas around Guwahati city of Assam for a period of two months. A total of 50 prescriptions fulfilling the inclusion criteria were included. Results: Total number of drugs prescribed was 346; average number of drugs per prescription was 6.92. Total number of antibiotics prescribed was 50(100%). The most common URTI was acute nasopharyngitis (36%) followed by acute sinusitis (20%).The most commonly prescribed antibiotic was amoxicillin+ clavulanic acid (36%). All (100%) the drugs were prescribed by brand names. The average cost per prescription was Rs. 150.Conclusion: The present study shows high rate of antibiotic prescription in URTI which can be considered quite inappropriate as well as this signifies overuse of antibiotics.

Introduction:

The problem of overuse of antimicrobials is a global phenomenon. In India, the prevalence of use of antimicrobials varies from 24% to 67%.[1] According to a recent study, acute respiratory infections are the reason for 75% of the antibiotic prescriptions each year and are the most frequent reason for seeking medical attention. This occurs despite the fact that in most cases of URTIs (Upper Respiratory Tract infections), antibiotics confer little or no benefit.[2]

Respiratory tract infection (RTI) is defined as any infectious disease of the upper or lower respiratory tract. Upper respiratory tract infections (URTIs) include common cold, laryngitis, pharyngitis/tonsillitis, acute rhinitis, acute rhinosinusitis and acute otitis media. Viruses cause most URTIs, with rhinovirus, parainfluenza virus, coronavirus, adenovirus, respiratory syncytial virus, Coxsackie virus, human metapneumovirus, and influenza virus accounting for most cases.[3] Group A beta-hemolytic streptococci (GABHS) causes 5% to 10% of cases of pharyngitis in adults.[4] Other less common causes of bacterial pharyngitis include group C beta-hemolytic streptococci, *Corynebacterium diphtheriae*, *Neisseria Gonorrhoea*, *Arcanobacterium haemolyticum*, *Chlamydophila* (formerly Chlamydia) *pneumoniae*, *Mycoplasma pneumoniae*, and herpes simplex virus. *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* are the most common organisms that cause the bacterial superinfection of viral acute rhinosinusitis. [5]

There is evidence that antibiotics are often used inappropriately to treat URTIs. Some concerns about overuse of antibiotics are that it leads to unnecessary cost and the potential of adverse effects for the individual taking the antibiotic. But even more important concern is the adverse effect on public health due to the development of antibiotic resistant bacteria.[6]

Hence the present study was conducted to understand the prescribing pattern of antibiotics as well other drugs in the treatment of Upper respiratory tract infections by the general practitioners of rural areas around Guwahati city of Assam.

Materials and Methods:

Study Design:

Community based observational, cross sectional study

Sample Size:

A total of 138 prescriptions collected from patients attending general practitioners in the rural areas around Guwahati city with the complaints related to infection of respiratory tract and after applying inclusion and exclusion criteria, 50 prescriptions were included for the study.

Duration of Study:

Two month (January – February 2015)

Data Collection Method:

Prescriptions of all patients were collected, relevant information entered in a preformed proforma and analyzed. Patient details such as age, sex, diagnosis and drugs prescribed were recorded.

Inclusion Criteria:

1. All patients treated on ambulatory basis.

2. Patients diagnosed to have upper respiratory tract infections like acute nasopharyngitis (Common cold), acute sinusitis, acute pharyngitis, acute tonsillitis, acute rhinitis, Acute suppurative otitis media (ASOM).

Exclusion Criteria:

1. Patients not willing to give consent

2. Patients diagnosed to have lower respiratory tract infections.

Data was analyzed for the prescribing pattern using WHO drug indicators.[7]

1) Average number of drugs per encounter.
2) Average drug cost per encounter.
3) Percentage of drugs prescribed by generic name.
4) Percentage of antibiotic prescribed.
5) Percentage of antihistaminic prescribed.
6) Percentage of topical route of drug administration.
7) Percentage of other concomitant drugs used.

Results:

Out of 50 patients 36(75%) were male and 12(25%) were female. Most (50%) of the patients belonged to the age group of 15-35 yrs. The most common URTI was found to be acute nasopharyngitis (36%) followed by acute sinusitis (20%) and acute pharyngitis (18%). The antibiotic that is most commonly prescribed to the patients was amoxicillin+ clavulanic acid (36%) followed by amoxicillin (22%) and cefixime (18%). Out of 50 patients with URTI 35(70%) patients were prescribed topical preparation. The most commonly used topical preparation was xylomethazoline (34%) followed by providone iodine (22%). All the patients were prescribed with any one of the antihistaminic drug. Most commonly used drug was the combination of Paracetamol+caffine +Phenylepherine+Chlorpheneramine Maleate (58.7%) followed by Cetrizine (24%). All the patients (n=50) had combination of Diclofenac+Paracetamol +serratiopeptidase as analgesic. Most commonly used drug for prevention of peptic ulcer disease due to use of analgesic is pantoprazole (34%) followed by ranitidine

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(10.7%). The total number of drugs prescribed (including topical preparations, antihistaminics and analgesics along with antibiotics) was 346 and the mean number of drugs per prescription was found to be 6.92. The average cost of treatment was found to be Rs 150. All the drugs were prescribed in their brand names and not a single drug was prescribed in the generic name. The quality indicators of drug use are described in Table 1.

Table 1: Quality indicators of drug use

Parameter	No. & percentage
Total no. of prescriptions	50
Total no. of drugs prescribed	346
Mean no. of drugs per prescriptions	6.92
Antibiotic prescription rate	50(100%)
No. of drugs prescribed by generic name	0(0%)
No. of drugs prescribed by brand name	346(100%)
Average cost per prescription	Rs. 150

Discussion:

A prescription by a doctor may be taken as an indication of the doctor's attitude towards the disease and the role of drugs in its treatment. The mean number of drugs per prescription in our study was 6.92. A similar study done by Thandu SKG et al [8] in Mumbai India found the mean number of drugs per prescription to be 3.55. This study was a Hospital Outpatient Department (OPD) based study. The higher rate of mean number of drugs prescribed in our study may be due to the fact that it is a community based study in a rural area where the physicians may not be following a proper guideline while prescribing drugs in URTI. The average number of drugs per prescription is an important parameter while doing a prescription audit. A hospital based study in India had reported a mean number of two drugs.[9] The mean number of drugs prescribed in this study is more than other studies reported in the literature.[10, 11] Each prescription contains an antibiotic, an antihistamine, analgesics and nasal decongestant on an average.

In the present study, an overall antibiotic prescription rate for patients with URTI was 100% i.e. every prescription had one antibiotic prescribed in it which is very high for treating diseases with an overwhelmingly viral etiology (>85% in some studies). A study in 2001 at Siriraj Hospital, Thailand[12] showed that the antibiotic prescription for adults with URI was 86.0% which is also quite high. Similar study in Japan found 60% prescription rate of antibiotics for URTI.[13]A low rate (18%) of antibiotic prescription for URTI was shown in one study conducted by Gjelstad S et al in Norway.[14] Study by Bjerrum L et al in Denmark reported that prescription rates were 57% and 38%, for acute sinusitis, tonsillitis respectively by general medical practitioners.[15] In contrast, in Spain the antibiotics were prescribed in 65% and 62%, of the patients with acute sinusitis and tonsillitis respectively.[15] In the United States, the antibiotic prescription rates varied depending on the institute and the year studied. A chart review from 2003 to 2004 in the United States showed the prescription rate for URTI to be 38%.[16] These studies show that antibiotic prescription rate for URTI is high in both developing and developed countries in Asia as well as in South Europe, compared with low rates in Scandinavian countries and most hospitals in the United States.

Amoxicillin clavulanic acid combination was the most commonly prescribed antibiotic in the present study i.e. 36%. In Thandu SKG et al [8] study the most common antibiotic was also same as present study i.e. Amoxicillin + Clavulanic acid 12.39%. The present study is again in accordance with another study from India conducted by Sridevi SA et al.[17] where amoxicillin + clavulanic acid use was 27% which is the most commonly used antibiotic. A study by Mungrue K et al in the year of 2005 showed that amoxicillin (70.3%) was the most frequent antibiotic prescribed. Erythromycin (10.4%), amoxicillin+calvulanic acid (9.1%) and cefixime (8.0%) were the other antibiotics used.[18] Although clavulanic acid is not an antibiotic, it protects amoxicillin from enzymatic destruction by binding to them resulting in potentiating or synergistic effect.

Another study in India showed that the most commonly prescribed antibiotic was penicillin (28.6%), followed by a fluoroquinolone (19.5%).[19] In Japan, third generation cephalosporin was the most commonly prescribed antibiotic (46%), followed by a macrolide (27%) and a quinolone (16%).[13] In Norway, 37% of the patients treated for URI were prescribed penicillin V and 28% a macrolide.[14] In Denmark, a narrow-spectrum penicillin was the most commonly prescribed drug (58%), followed by a macrolide (29.0%) and a broad-spectrum penicillin.[15] In Spain, the most commonly prescribed antibiotic was a broad-spectrum penicillin (62.3%), followed by a macrolide (22.3%) and a quinolone 96.7%.[15]. A study in the United States from 1998 to 2003 showed that broad-spectrum antibiotics (cephalosporins, new generation macrolides, and respiratory quinolones) were the most frequently prescribed (56%).[20] In conclusion, narrow spectrum penicillin is the most frequently prescribed antibiotic in present study, India, and Scandinavian countries, compared with a broad-spectrum penicillin/ cephalosporin commonly prescribed in Japan, South Europe, and the United States. The difference in the type of antibiotic prescribed among different countries may be due to several factors including knowledge of the care provider, local data regarding etiologic agent and susceptibility pattern, availability and cost of the antibiotic.

In topical preparation, Xylometazolline 17(34%) was the highest prescribed (a nasal antihistamines, block the action of histamine, which is released on exposure to allergens). They are used to relieve hay fever symptoms such as sneezing, runny nose and other nasal symptoms in URTI. The other oral antihistamine commonly prescribed were Chlorpheneramine Maleate 27(58.7%) which was used in combination with analgesic drugs and Cetrizine 11(24%). The literature offers very little support for the use of antihistamines for the common cold.[21]

In the present study, it was found that all the drugs were prescribed by their brand names only, which could be due to the influence of medicinal drug promotional activities. Prescribing the brand name may undermine some of the goals of essential drug concept. On the other hand, prescribing by generic names may reduce overall expenditure on drugs, especially on newer antibiotics.

The present study has some limitations.

1. Short data collection period (2 months) 2.Small sample size, 3. Seasonal variation which can affect the severity of URTI's. 4. Lack of information about definite bacterial etiology and also prevalent organisms. Furthermore this study did not explore the adverse effects of drugs prescribed. Also some important data including pertinent symptoms and physical signs, the attitude and knowledge of caring physicians regarding management of URTI and the request for antibiotics by patients were not available.

Conclusion:

The present study shows a very high rate of prescription of antibiotics in URTIs i.e. every prescription had an antibiotic prescribed in it. Considering the viral etiology of most of the URTIs, this high rate of antibiotic prescription can be considered quite inappropriate as well as this signifies overuse of antibiotics. In the present era of emerging antibiotic resistance, this overuse of antibiotics by the rural physicians for URTIs is of major concern. Reducing antibiotic use may require a major change in the

mindset for both general practitioners and the patients. Rational prescribing in URTI is consistent with the doctors' professional role and may not lead to a disruption of doctor-patient relationship. This study puts light on the urgent need of extensive studies regarding the reasons for over prescription of antibiotics along with a Government supported program, mainly focusing rural medical practitioners to educate & update them regarding the indications for antibiotic use in the cases of upper respiratory infections.

REFERENCE

1. K.Ramachandra, Narendranath Sanji, H.S. Somashekar et al. Trends In Prescribing Antimicrobials In An Ent Outpatient Department Of A Tertiary Care Hospital For Upper Respiratory Tract Infections: International Journal Of Pharmacology And Clinical Sciences April 2012 Vol.1 Issue 1: 15-18. | 2. Hirschmann JV. Antibiotics for common respiratory tract infections in adults. Arch Intern Med 2002; 162:256-64 | 3. Kistler A, Avila Pc, Rouskin S, et al. Pan-Viral Screening Of Respiratory Tract Infections In Adults With And Without Asthma Reveals Unexpected Human Coronavirus And Human Rhinovirus Diversity :J Infect Dis 2007; 196:817–825. | 4. Wessels Mr. Clinical Practice: Streptococcal Pharyngitis. N Engl J Med 2011; 364:648–655. | 5. Wilson Jf. In The Clinic: Acute Sinusitis. Ann Intern Med 2010; 153 | 6. Dowell S, Schwartz B. Resistant pneumococci: protecting patients through judicious use of antibiotics. Am Fam Physician 1997; 55:1647-54. | 7. Cheong LT, Kwok CL, Syed MA, Molly C. Antibiotic Prescription in Upper Respiratory Tract Infections. Asia Pacific Family Medicine, 2004; 3: 38-45 | 8. Thandu SKG et al. Drug Utilization Pattern in Upper Respiratory Tract Infections in ENT Outpatient Department of Tertiary Care Hospital. Indian Journal Of Applied Research. X Indian Journal Of Applied Research. 2014: 4 (5). | 9. Hartzema Ag, Porta M, Tilson Hh. Pharmacoepidemiology: An Introduction, 3rd Edition. 1998.Cincinnati: Harvey Whitney Books. | 10. Srishyla Mv, Krishnamurthy M, Nagarani Ma et al. Prescription Audit in an Indian Hospital Setting Using The Ddd(Defined Daily Dose) Concept. Indian J pharmacol 1994; 26: 23-28. | 11. Rishi Rk, Sangeeta S, Surendra K et al. Prescription Audit: Experience in Garhwal (Uttaranchal), India. Trop Doct 2003; 33: 76-79. | 12. Thamlikitkul V, Apisitwittaya W. Implementation of clinical practice guidelines for upper respiratory infection in Thailand. Intern J Infect Dis. 2004; 8: 47-51. | 13. Higashi T, Fukuhara S. Antibiotic prescriptions for upper respiratory tract infection in Japan. Inter Med. 2009; 48:1369-75. | 14. Gjelstad S, Dalen I, Lindbaek M. GPs' antibiotic prescription patterns for respiratory tract infections still room for improvement. Scand J Prim Health Care. 2009; 27:208-15. | 15. Bjerrum L, Boada A, Cots JM et al. Respiratory tract infections in general practice: considerable differences in prescribing habits between general practitioners in Denmark and Spain. Eur J Clin Pharmacol. 2004; 60: 23-8. | 16. Gonzales R, Camargo CA Jr, MacKenzie T et al. Antibiotic treatment of acute respiratory infections in acute care settings. Acad Emerg Med. 2006; 13:288-94. | 17. S. A. Sridevi, T. Janagan, P. Rathnasamy et al. Drug Utilization Study In The Otorhinolaryngology Department In A Tertiary Care Hospital :Int J Basic Clin Pharmacol. 2013 Jun;2(3):306-310. | 18. Mungrue K, Brown T, Hayes I et al. Drugs in upper respiratory tract infections in paediatric patients in North Trinidad. Pharmacy Practice 2009;7(1):29-33 | 19. Kumar R, Indira K, Rizvi A et al. Antibiotic prescribing practices in primary and secondary health care facilities in Uttar Pradesh, India. J Clin Pharm Ther. 2008; 33:625-34. | 20. Gill JM, Fleischut P, Haas S et al. Use of antibiotics for adult upper respiratory infections in outpatient settings: a national ambulatory network study. Fam Med. 2006; 38:349-54. | 21. Atanasova I, Terziivanov D. Investigations On Antibiotics In A Hospital For 1 Year Period. Int J Clin pharmacol Ther. 1995; 33: 32-33. |