



Assessment of Drug Usage Pattern of Antibiotics Used in ENT OPD of Tertiary Care Teaching Hospital

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ABSTRACT

Introduction: Diseases of the ear, nose and throat (ENT) affect the functioning of adults as well as children. The Objective of this study was to assess the antibiotic usage in ENT outpatient.

Material & Method: Total 200 prescriptions were randomly analyzed. The data was collected in customized Performa including patient's particulars, probable diagnosis, drug details and information regarding drugs, doses and dosage forms.

Result: Of total 200 cases, 110 patients were diagnosed of Ear disease ie(Chronic Supportive Otitis Media (CSOM) (60%), Acute Supportive Otitis Media (ASOM) (10%), Glue Ear (3%) and Otitis externa (2%) and remaining 90 patients were found to be suffering from either Nose & Throat disease ie UTI(33%), Sinusitis(25%), Tonsillitis (10%), Pharyngitis (5%), Laryngitis (2%), Epiglottis (1%), Tonsilo adenoiditis (10%), Posterior pharyngeal abscess (2%), Laryngo pharyngitis (5%) Furunculosis (5%) and oral cavity ulcer (2%). Out of the total 653 drugs prescribed, 338 were antibiotics. Average antibiotic prescribed were 1.69. A total of 248 antibiotics were prescribed by oral route while 90 antibiotics were prescribed by topical route. The commonly prescribed antibiotic via oral route were Amoxicillin + Clavulanic acid(55%), Cefotaxime(30%), and via topical route were Polymyxin B(80%), Ofloxacin(10%) & Ciprofloxacin(10%). 90 patients were prescribed antibiotics therapeutically after antibiotic sensitivity test (AST) as compared to 110 patients without AST. Most common bacteria isolated were Staphylococcus aureus (31%) followed by streptococcus pneumoniae (18%) from Ear infection and Pneumococcus (60%) followed by Pseudomonas (20%) from Nose & throat infection.

Conclusion: Most common prescribed antibiotics were Amoxicillin and Clavulanic acid. Antibiotic sensitivity was not done in majority cases before prescribing the antibiotic.

Key Words: Antibiotic, CSOM, ASOM, ENT, Drug Utilization.

INTRODUCTION

Disease of the ear, nose and throat (ENT) affect the functioning of adults as well as children, often with significant morbidity causing impairment of routine life of affected patients. It has been noted that with increase in global population, infection remain the most important causes of disease

with upper respiratory tract infections (URTIs) causing hearing loss especially in children. The World Health Organization (WHO 2004) estimated that respiratory infections generated 94.6 disability adjusted life years lost worldwide and were the fourth major cause of mortality, responsible for 4 million deaths or 6.9% of global number of

deaths in 2002. ^(1,2) Many infectious diseases have been controlled in 20th century by improving living conditions, public health measures and with the use of antimicrobial agents. There has been alarming concern over the injudicious use of antimicrobial worldwide. The practice of indiscriminate prescribing of antibiotic has lead to ineffective and unsafe treatment, prolongation of illness, distress and harm to the patients as well as additional burden of a medical cost. ⁽³⁾

Most cases of ENT Infection are viral and, therefore, resolve spontaneously without antimicrobial therapy. The majority of the antibiotics were prescribed for respiratory and ENT infections with a presumed viral etiology, such as rhinopharyngitis and acute bronchitis. ⁽⁴⁾ The results of the different surveys were in agreement showing that antibiotic prescriptions are made in approximately 40% of all consultations for rhinopharyngitis and in 80% of those for acute bronchitis. ⁽⁶⁾ The variability in antibiotic prescription is attributable to the infecting organisms and antimicrobial susceptibility that differ from country to country, or even from region to region, but other factors may also be involved including physician preference, local policy, costs and lack of local guidelines. ⁽⁴⁻⁶⁾

The Problem of overuse of antibiotic is a global phenomenon. In India, the prevalence of use of antimicrobial varies from 24% to 67%. According to recent study acute respiratory infection are the reasons for the 75% of the antibiotic prescribing each year and is the most frequent reason for seeking medical attention. This occurs despite the fact that in most cases of URIs, antibiotic confers little or no antibiotic. ⁽⁷⁻⁹⁾ The International Network for the Rational Use of Drugs (INRUD) was established in 1989 to promote the rational use of drugs in developing countries. Various indicators were developed by INRUD in collaboration

with WHO that provided objective indices to allow for assessment of drug use practices. Still, there is a need for data on both antibiotic use and determinants of use from all the regions of the world. ^(10,11)

It is very essential to analyze and monitor the patterns of drug used from time to time, to enable the basic modification in prescribing practices to enhance the therapeutic benefit and decrease the side effects. Drug use evaluation is an ongoing, authorized and systemic quality improvement process, which will give right feed back to the clinician. The usage of antibiotic is increasing nowadays in all types of patients, and there are very few studies available to help to physician to prescribe suitable antibiotic. The antibiotic resistance is emerging and it is big threat to the society. This type of study will help medical professionals to prescribe the antibiotic rationally and therefore are extreme needed. Hence the present study has been designed to assess the usage of antibiotic in ENT department of MGM Medical College & Hospital. Based on the study results appropriate interventions at the level of the Physician and the Institute can be planned to promote rational use of antibiotics in our set up.

Objective:

To assess the patterns of Antibiotic used in ENT OPD

MATERIALS AND METHODS

- I. Necessary approval from the Institutional Ethics Committee was obtained before initiating the study.
- II. **Study site:** This drug utilization study was conducted at the departments of ENT and Pharmacology, MGM Medical College & Hospital, Kamothe, Navi Mumbai, India.
- III. **Study period:** The study was an observational study completed over a period of 9 months, from

September 2013 to April 2014.

- IV. **Study design:** Prospective-open labeled, observational study
- V. **Sample size:** Total 200 patients were recruited for the study
- VI. **Patient selection;**
- **Inclusion criteria:** Patient attending ENT OPD and giving consent to participate in the study.
 - **Exclusion criteria:** Patient who were seriously sick (emergency) and IPD patients.
- VII. **Study material:** A specially designed data entry format was used to record patients' details like patients' name, age, sex, Drug regimen, Drug dose.
- VIII. **Statistical Analysis:** Data was entered and analyzed with Microsoft Excel 2007. Value is expressed in Percentage.

The following drug utilization indicators were assessed:

WHO Prescribing Indicators:

- a. Average number of drug prescribed per patient
- b. Percentage of encounters with an antibiotic prescribed
- c. Percentage of encounters Injection
- d. Percentage of drugs prescribed by generic name
- e. Percentage of drug from Essential drug list

RESULTS

The totals of 200 patients were analyzed for the antibiotic usage pattern in the ENT department. Maximum Patients belonged to the age group of 16-30 yrs (40%). Out of the total patients, 28 % were children. The proportion of Male (62%) patients was more as compared to female patients (38%).(Table 1)

Total 200 prescription of Patients who were visited our ENT OPD were analyzed. Of total 200 patients, 110 patients were diagnosed Ear disease and 90 patients

were diagnosed with Nose and Throat Infection. Total drug prescribed was 653 and total antibiotic prescribes was 337 in 200 prescription. Average drug per prescription was 3.26 and Average antibiotic per prescription was 1.68. Among total 337 antibiotic, 247 antibiotic prescribed by oral route and 90 were prescribed by Topical route. No injectable was prescribed in present study. 75% of Antibiotic Prescribed from Essential Drug List. Most commonly antibiotic prescribed was Combination of Amoxicillin plus Clavulanic acid. Ploy pharmacy was seen in 32% cases and almost all drugs were prescribed by Brand name. (Table 1)

Among total, 110 Patients diagnosed with Ear infection, 60 % had CSOM, 25% ASOM and Acute Otitis media (AOM), Glue Ear, Otitis Externa 10%, 3% and 2% respectively. (Fig 1)

Among 90 cases of Nose and Throat Infection, 33% diagnosed with Upper respiratory tract infection, 25% diagnosed with sinusitis, 10% Tonsillitis, and pharyngitis, Laryngitis, Epiglottis, Tonsilloadenoiditis, Posterior Pharyngeal Abscess, Laryngio pharyngitis, Furunculosis and Oral cavity ulcer were diagnosed in 5%, 2%, 1%, 10%, 2%, 5%, 5% and in 2% respectively. (Fig 2)

A total of 248 oral antibiotics were prescribed. 55% Amoxicillin plus Clavulanic acid combination, 30 % was Cefotaxime, 5% Ciprofloxacin, 3% Azithromycin, 4% Levofloxacin and 3% Metronidazole were prescribed. Amoxicillin plus Clavulanic acid combination was prescribed in dose of 625 mg BD for adult and 45 mg/kg Body weight for children under 15 yrs. Cefotaxime in dose of 200mg BD for adult and 8mg/kg Body weight for children was prescribed. Azithromycin, Levofloxacin and metronidazole were prescribed in dose of 500 mg OD, 500mg OD and 400mg TDS for adult respectively. Ciprofloxacin, Azithromycin, Levofloxacin

and Metronidazole were not prescribed in children in present study. (Fig 3)

Among the total 90 topical antibiotics prescribed, Polymyxin B was prescribed in 80% cases (3 drops TDS), 10% Ofloxacin (3 drops TDS) and 10% Ciprofloxacin (3 drops TDS) for both adult as well as children (Fig 4)

Polypharmacy was also encountered in the present study. Single antibiotic FDC were seen in 39.5% prescriptions, 2 antibiotics combinations were encountered in 52.5% prescriptions and 3 antibiotic combinations were encountered in 8% of the prescriptions. (Table 2)

Among a total of 653 drugs, other concomitant drugs prescribed were 315: combination of Phenylephrine+ paracetamol +levocetirizine (57%), Mucolite (6.98%)

Multivitamin (14.28%), Xylometazoline (13.33%), Oxymetazoline (2.55% and Diclofenac (5.71%) (Table 1)

Among the 200 patients studied, only 90 patients were sent for Antibiotic Sensitivity Test (AST): 50 patients of Ear disease and 40 patients with Nose & Throat infection were sent for AST. The most common organism isolated from Ear infection patients were Staph aureus (31%) followed by Haemophilus influenzae (8%), Streptococcus (18%), Moraxella Catarrhalis (7%), Streptococcus pyogenes (24%) and Pseudomonas aeruginosa (12%).(Fig 5) Most common organism isolated from Nose and throat infection were Pneumococcus (60%), Pseudomonas aeruginosa (20%) and Staph aureus (20%). (Fig 6)

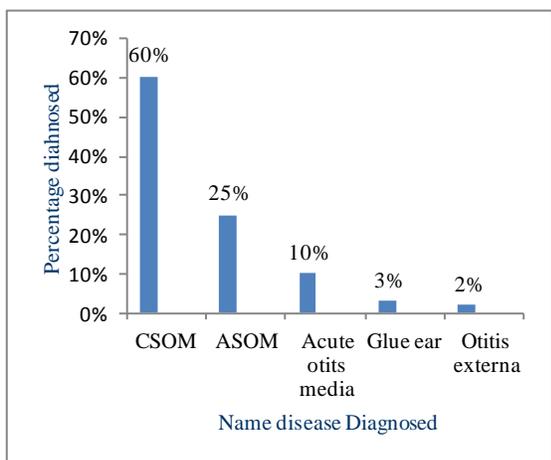


Fig 1 shows: Diagnosis of Ear disease

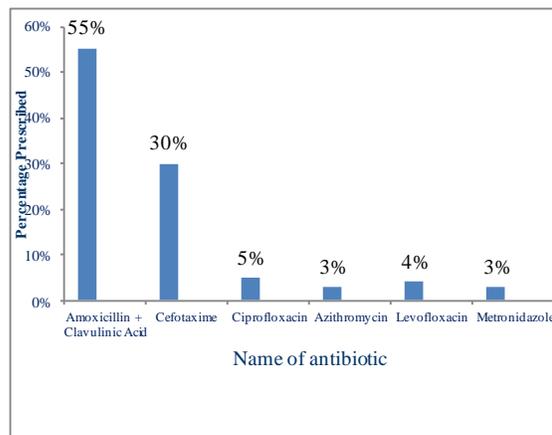


Fig 3 shows: Pattern of Antibiotics prescribed.

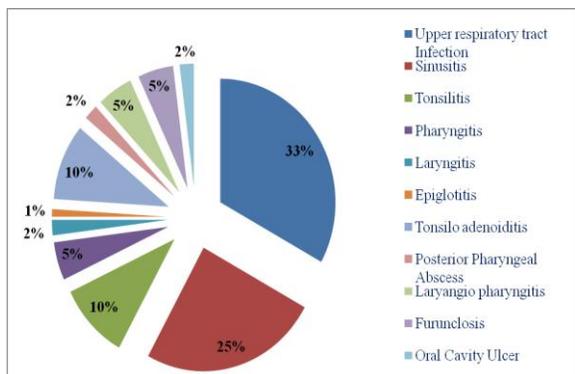


Fig 2 Shows: Diagnosis of nose and throat Infections

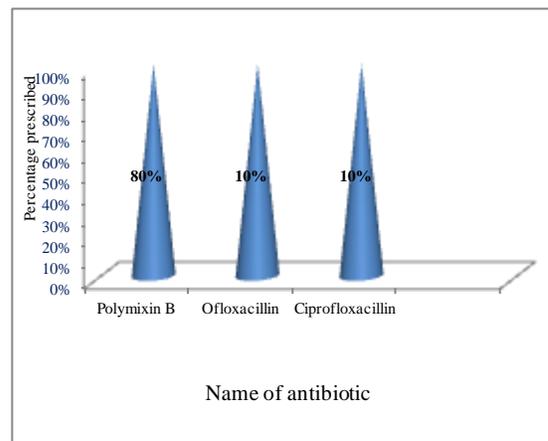


Fig 4 shows: Prescribing pattern of topical antibiotic.

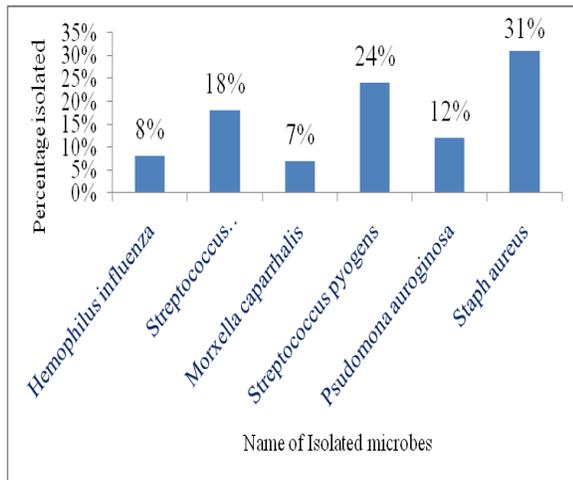


Fig 5 shows: Isolated organism in Ear infection Patients

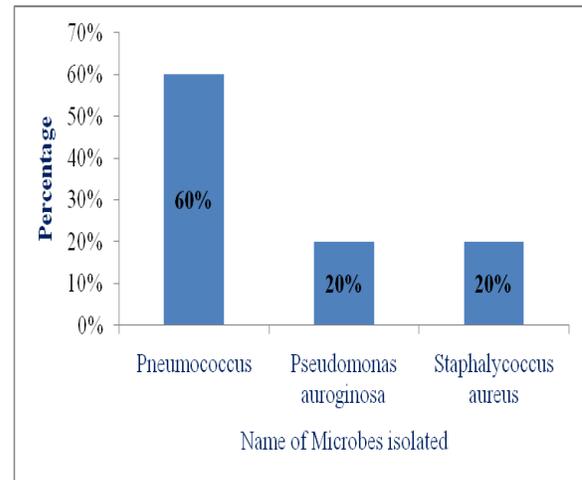


Fig 6 shows: Organism isolated from Nose and throat infection Patients

Table 1 shows: Pattern of Data of ENT Patients

S.NO	PARAMETERS	RESULTS
1	Total no. of sample	200
2	Opd sample	200
3	Max age group	20-30 yr (40%)
3	Gender Distribution	
	Male	62%
	Female	38%
4	Diagnosis	
	Ear disease	110
	Nose and Throat Disease	90
	Total drug prescribed	653
5	Average Drugs/prescription	3.26
6	Total antibiotic prescribed	337
7	No of Oral antibiotic prescribed	247
	Average antibiotic /Prescription	1.68
8	No Of Topical antibiotic prescribed	90
9	Poly-pharmacy practice	32%
10	Injectable prescribed	0%
11	Most commonly prescribed antibiotic	Amoxicillin + Clavulinic Acid
12	Percentage of Antibiotic prescribed from Essential Drug List	75%
13	Encounters with brand names	100%
14	No of Other Concomitant medication Prescribed	315
15	Concomitant medication prescribed(Other than antibiotic)	Phenylpherine+Paracetamol+LevocettrizineCombination, Mucolyte, Xylometazoline, Diclofenac, Multivitamin

Table 2 shows: Pattern of Prescribed antibiotic

SN	Prescribing form	No. of prescriptions (%) (N=200)
1	FDC	79(39.5%)
2	Two antibiotic	105(52.5%)
3	Three antibiotic	16(8%)

DISCUSSION

The Drug prescription by doctor reveals important data regarding rational drug usage. In general practice, the therapeutic approach for ENT infections is nearly empirical and the main aim of physicians is to treat as specifically as

possible, while covering the most likely pathogens. The present descriptive study indicates general trends of prescribing antibiotic in the OPD of ENT department.

A total of 200 prescriptions were analyzed and the demographic data showed that percentage of males suffering from ENT infections was more than females. Similar findings were also reported by P. Sivakumar *et al.*, Das *et al* and Ain *et al*, showing higher percentage of males suffering from ENT infections. ^(12,3,4) In the present study, Male patients were encountered more

frequently than female patients. In contrast according to the study conducted by Harish *et al*, female patients enrolled in the study and suffering from ENT infection were more than their male counterparts. (13)

In present study, it was found that maximum patients belonged to the age group of 16–30 years. It indicates that ENT infections are more prevalent in young adults. Similar finding were reported in previous studies. (4,10)

In the present study out of the 200 prescriptions studied, total drugs prescribed were 653 and total antibiotic encountered was 337. Average number of drugs per prescription was 3.26 and average antibiotic prescribed per prescription was 1.68. Among the total 337 antibiotics encountered, 247 antibiotics were prescribed by oral route and 90 were prescribed by topical route. In a similar study reported by Das *et al*. and Ain *et al*, 1.5 and 1.4 antimicrobial agents per patient were prescribed in outpatient services of ENT department. (3,4) This is comparatively lower than the present study.

Of total 200 patients, 110 patients were diagnosed Ear disease and 90 patients were diagnosed with Nose and Throat Infection. The Patients diagnosed with Ear infection was suffering from different types of common infection like CSOM (60 %), ASOM (25%) and acute Otitis media (AOM, 10%), Glue Ear (3%), Otitis Externa (2%) respectively. Among 90 cases of Nose and Throat Infections, 33% cases were diagnosed with Upper respiratory tract infection, 25% diagnosed with sinusitis, 10% with Tonsillitis. Pharyngitis, Laryngitis, Epiglottis, Tonsillo adenoiditis, Posterior Pharyngeal Abscess, Laryngio pharyngitis, Furunculosis and Oral cavity ulcer were diagnosed in 5%, 2%, 1%, 10%, 2%, 5%, 5% and in 2% cases respectively. CSOM was the common infection in Ear disease and Upper respiratory was common

in Nose & throat disease. The previous studies also reveals similar finding. (3,4)

Patients suffering from various acute and chronic ENT infections were treated with different antibacterial agents. A total of 248 oral antibiotic were prescribed: 55% Amoxicillin plus Clavulanic Acid combination, 30 % was Cefotaxime, 5% Ciprofloxacin, 3% Azithromycin, 4% Levofloxacin and 3% Metronidazole. Amoxicillin plus Clavulanic acid combination was prescribed in dose of 625 mg BD for adult and 45mg/kg body weight for children under 15 yrs. Cefotaxime in dose of 200mg BD for adult and 8 mg/kg body weight for children was prescribed. Azithromycin, Levofloxacin and metronidazole were prescribed in dose of 500 mg OD, 500mg OD and 400mg TDS for adults respectively. Ciprofloxacin, Azithromycin, Levofloxacin and Metronidazole were not prescribed in children in the present study. Among a total of 90 topical antibiotics prescribed, Polymyxin B was prescribed in 80% (3 drop TDS), 10% was Ofloxacin (3 drop TDS) and 10% was Ciprofloxacin (3 drop TDS) for both adult as well as children. No injectable was prescribed in present study. Most commonly prescribed antibiotic was combination of Amoxicillin plus Clavulanic acid. Lishaet al [1144] showed similar pattern of antibiotic prescription as observed in the present study, but they encountered predominantly injectables being prescribed. This result is in contrast to our results. Study by Das *et al*, MR Ain *et al* and others showed wide variety of antibiotic prescription, larger than present study. (3, 4,12,13)

Single antibiotic fixed dose combination was encountered in 79(39.5%) prescriptions, 2 antibiotics were prescribed in 105(52.5%) prescriptions and three antibiotics combination were prescribed in 16(8%) prescriptions. Das *et al*. have reported that monotherapy were prescribed

the maximum cases. ⁽³⁾ 2 antibiotic combinations prescribed included oral as well as topical. All the drugs were prescribed by brand names, similar to the reported previous study. ⁽⁴⁾ This is a major area of concern as according to the guidelines all drugs should be prescribed by generic names as generic prescribing is considered as rationale. Generic prescribing is more cost effective, associated with less potential for errors and is therefore encouraged by all prescribers.

90 patients were prescribed antibiotics after antibiotic sensitivity test (AST) as compared to 110 patients without AST. Most common bacteria isolated were Staphylococcus aureus (31%) followed by streptococcus pneumoniae (18%) isolated from Ear infection and Pneumococcus (60%) followed by Pseudomonas (20%) isolated from Nose & throat infection. Das et al have reported common microorganisms like staphylococcus aureus ⁽³⁾ and pseudomonas isolated in their study.

CONCLUSION

Prescription by brand name is an issue that needs to be addressed. Most commonly prescribed antibiotics for various acute and chronic ENT infections were Amoxicillin and Clavulanic acid. Antibiotic sensitivity was not done in majority cases before prescribing the antibiotic.

REFERENCES

1. Farhan Ahmad Khan, Sheikh Nizamuddin, Mohammad Taria Salman. Patterns of Prescriptions of the antimicrobial agents in the Department of otorhinolaryngology in a tertiary care teaching Hospital. African J Pharmacy & Pharmacology (2011);5(14):1732-1738.
2. Grace NN, Bussmann RW (2006). Traditional management of ear, nose and throat (ENT) diseases in Central Kenya. J. Ethnobiol. Ethnomed.2:54.

3. Das BP, Seth A, Rauniyar Gp, Sharma Sk. Antimicrobial Utilization Pattern in outpatient Services of ENT Department of Tertiary care Hospital Of Eastern Nepal. Kathmandu University Medical Journal (2005);3(12):370-375.
4. MR.Ain, N.Shazad, M.Aqil, M.S Alam, R.Khanam. Drug Utilization pattern of antibacterial used in ear, nose & throat outpatients Department of University Hospital at New Delhi. J. Pharm&Bioallied Sci.2010;2(1):8-12.
5. Jain N, Lodha R, Kabra SK. Upper respiratory tract infections. Indian J Pediatr. 2001; 68:1135-8.
6. Needham A, Brown M, Freeborn S. Introduction and audit of general practice antibiotic formulary. J R Coll Gen Pract. 1988;38:166-7.
7. K.Ramchandra, NarendranathSanji, H.S Somashekar, Abhishek Acharya, Keerthisagar J, SusheelaSomappa, Halemani. Trends in Prescribing antimicrobial in an ENT Outpatients Department of tertiary care Hospital for upper respiratory Tract Infection. Int. J. pharmacol&clinSci (2012);1: 15-18.
8. Cheong LT, Kwok CL, Syed MA, Molly C. Antibiotic Prescription in upper respiratory Tract infection. Asia pacific family medicine 2004;3:38-45.
9. Hirschmann JV. Antibiotic for common respiratory tract infection in adults. Arch intern med 2002;162: 256-64.
10. Farhan Ahmad Khan, Sheikh Nizamuddin. Drug utilization patterns of Antimicrobial Agents in the Outpatients Department Of ENT in a tertiary care teaching Hospital of North India. JAPHR (2011);1(2):22-30.

11. LaporteJR, PortaM, CapellaD. Drug utilization studies: A tool for determining the effectiveness of druguse. Br J Clin Pharmacol 1983; 16:301-4.
12. P. Sivakumar, T. Abdu Razak, P. Perumal. Drug Utilization of antimicrobial in ENT Patients. Asian J Pharmaceutical & Clin Research (2011);4(1):22-23.
13. Harish GovindNaik, Chitra C. Khanwelkar, AshwiniKolur, Rohit Desai, Sunil Gidamudi. Drug Utilization Study on Antibiotics Use in the Upper Respiratory Tract Infection. International Journal of Recent Trends in Science And Technology,(2014);10(2):299-302.
14. Lisha J. John, Meenu Cherian, Jayadevan Sreedharan, Tambi Cherian. Patterns of Antimicrobial therapy in acute tonsillitis: A cross-sectional Hospital-based study from UAE. An Acad Bras Cienc(2014); 86(1):451-457.

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