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Monitoring of Antibiotic in Children used for Acute Respiratory tract Infection

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ABSTRACT

Background

Respiratory tract infections are among the most frequently encountered clinical conditions and are one of the most common reasons for pediatric consultations in primary healthcare. The aim of the present study was to study the prescribing pattern of antibiotics in children with acute respiratory tract infections

Methods

A prospective observational study was conducted in pediatric department in a tertiary care teaching hospital for a period of 6 months. All the patients who were prescribed with any of antibiotic drug therapy were included in the study and reviewed.

Results

Among the 78 patients recruited for the study, 35 children were diagnosed with bronchopneumonia. In our study, 98.71% were prescribed with antibiotics; out of which, the most commonly prescribed antibiotics were i.v. cefotaxime (39.7%) and i.v. ceftriaxone (39.7%). The most commonly prescribed antibiotic in bronchitis, URTI, bronchiolitis plus aspiration pneumonia was cefotaxime. In bronchiolitis and bronchopneumonia, the commonly prescribed antibiotic was ceftriaxone.

Keywords: Antibiotic Drugs; Pediatric, Acute Respiratory tract infections

INTRODUCTION

Acute Respiratory Infections (ARIs) are the major cause of morbidity and mortality in children of developing countries. While the magnitude of the problem of ARIs and its implications were not recognized until recently, major developing countries have now realized the need to focus

attention on this problem. In our country too, ARIs constitute a serious health problem and are responsible for 20-30% of death amongst children under 5 years of age and constitutes nearly 47% of total mortality in India. These figures are as a result of complex interplay of socio-economic, educational nutritional and environmental factors [1, 2].

Antibiotics are one of the oldest discovered drugs that combat specific microorganisms like bacteria and fungi. These substances are produced by microorganisms, which at low concentration kill the other microorganisms [3]. In pediatrics; antibiotics are mostly prescribed as they have higher rates of infections and due to their immature immunity and susceptibility to bacterial infection [4].

Even though current evidence does not warrant the routine use of antibiotics in upper respiratory tract infections, their injudicious use in family practice in United States revealed 79% of prescriptions were unnecessary according to the Centre for Disease Control and Prevention (CDC) guidelines [5].

Infants and children are among the most vulnerable population groups to acute respiratory infections. The use of anti-microbial agents, especially antibiotics has become a routine practice for the treatment of pediatric illnesses. The key role of antibiotics for the treatment of infectious diseases that are prevalent everywhere in developing countries may not be denied. However, there are also reports of irrational use of antibiotics, which may even lead to infections that are worse than the originally diagnosed ones [6, 7].

Respiratory tract infections remain the major cause of morbidity from acute illness, and most likely represent the single most common reason patients seek medical attention [8]. The most common infections involving the lower respiratory tract infections include bronchitis, bronchiolitis and pneumonia. Lower respiratory tract infections (LRTIs) in children and adults are mostly common as a result of either viral or bacterial invasion of lung parenchyma. Otitis media, pharyngitis, sinusitis are the most common acute upper respiratory tract infections of early childhood [9, 10].

METHODS

The study was conducted at bedded tertiary care hospital equipped with modern diagnostic and treatment facilities. The present study was conducted at the Pediatric Department. Informed consent was obtained from all the care takers of patient by explaining them in their language about the process of work. The relevant data were collected in specially designed proforma, which contained patient demographics, diagnosis, investigations, drug details and information from the prescriber regarding the indication for prescribing antibiotic agent, suspecting organism underlying infection, duration of therapy.

Inclusion Criteria

- Pediatric Patients of age between 6 weeks to 12 years with acute respiratory tract infections.
- Patients prescribed with antibiotics on inpatient basis.
- Patients who consented to participate.
- Those patients who were referred for hematological tests.

Exclusion Criteria

- Patients above 12 years of age.
- Patients not willing to comply with the study procedure.
- Patients with immune-compromised diseases.

Data analyses

Computer software was used for the analysis of the data and Microsoft word and Excel will be used to generation of graphs, tables etc.

RESULTS

A total of 78 children with respiratory tract infection were identified during the study period. Out of which, 55 of them were male and 23 females. 14 male children (25.5%) were from the age group of 6-12 months and 7 (12.7%) male patients were from the age group of upto 6 months. 8 (34.8%) female patients were from the age group of upto 6 months and 4 (17.4%) were from the age group of 2-5 years.

Table 1: Age and sex distribution

Age in years	Male		Female		Overall	
	No	%	No	%	No	%
Upto 6 months	7	12.7	8	34.8	15	19.2
6 - 12 months	14	25.5	5	21.7	19	24.4
1 - 2 years	9	16.4	6	26.1	15	19.2
2 - 5 years	13	23.6	4	17.4	17	21.7
5 - 12 years	12	21.8	-	-	12	15.4
Total	55	100.0	23	100.0	78	100.0

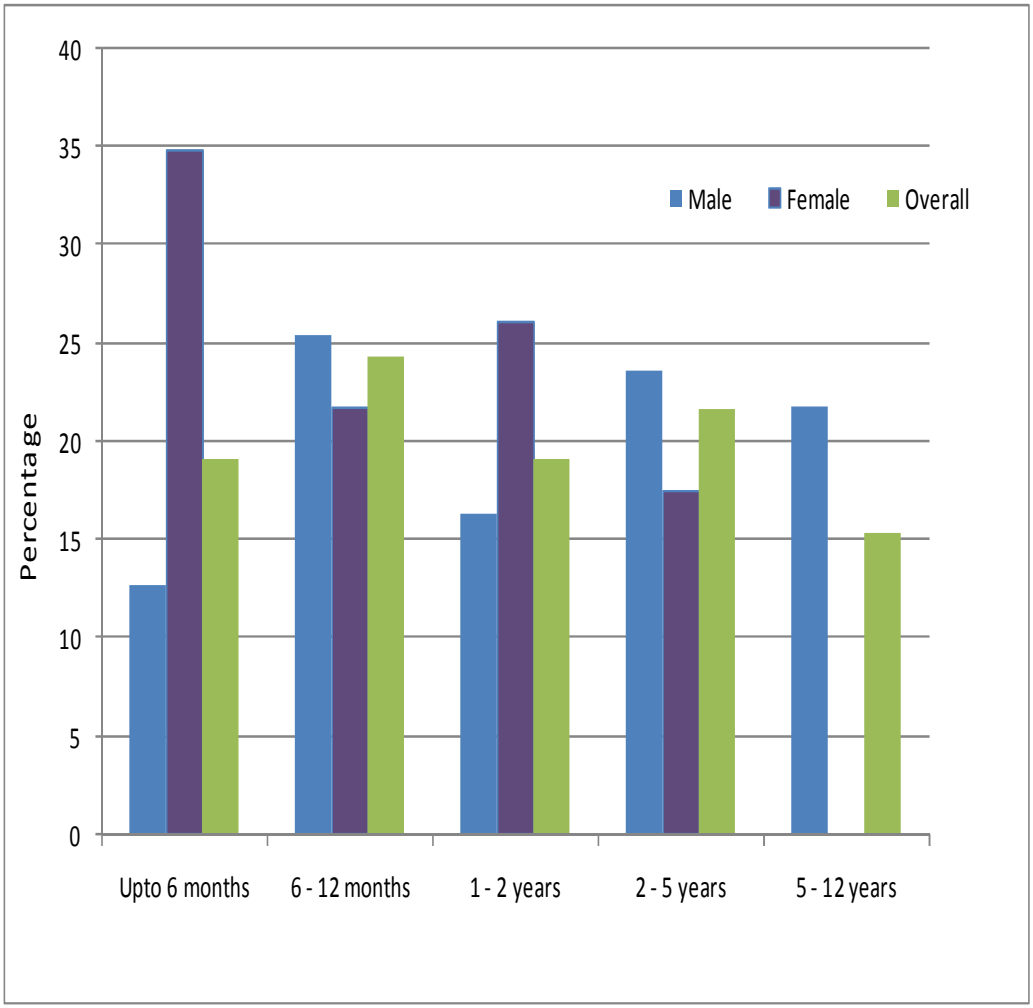

Figure 1: Bar diagram showing age and sex distribution

Among the 78 patients with respiratory tract infections, the most common symptoms present were cough, cold and fever. 76 (97.4%) children presented with cough, 50 (64.1%) presented with fever and 24 (30.7%) suffered from cold. 2 (2.6%) patients each were presented with breathlessness and chest in drawing.

Table 2: Common symptoms (n=78)

Common symptoms	Number	Percentage
Cough	76	97.4
Cold	24	30.7
Fever	50	64.1
Chest in drawing	2	2.6
Breathlessness	2	2.6
Noisy breathing	11	14.1
Hurried breathing	11	14.1
Running nose	9	11.5
Loose stool	10	12.8
Vomiting	11	14.1

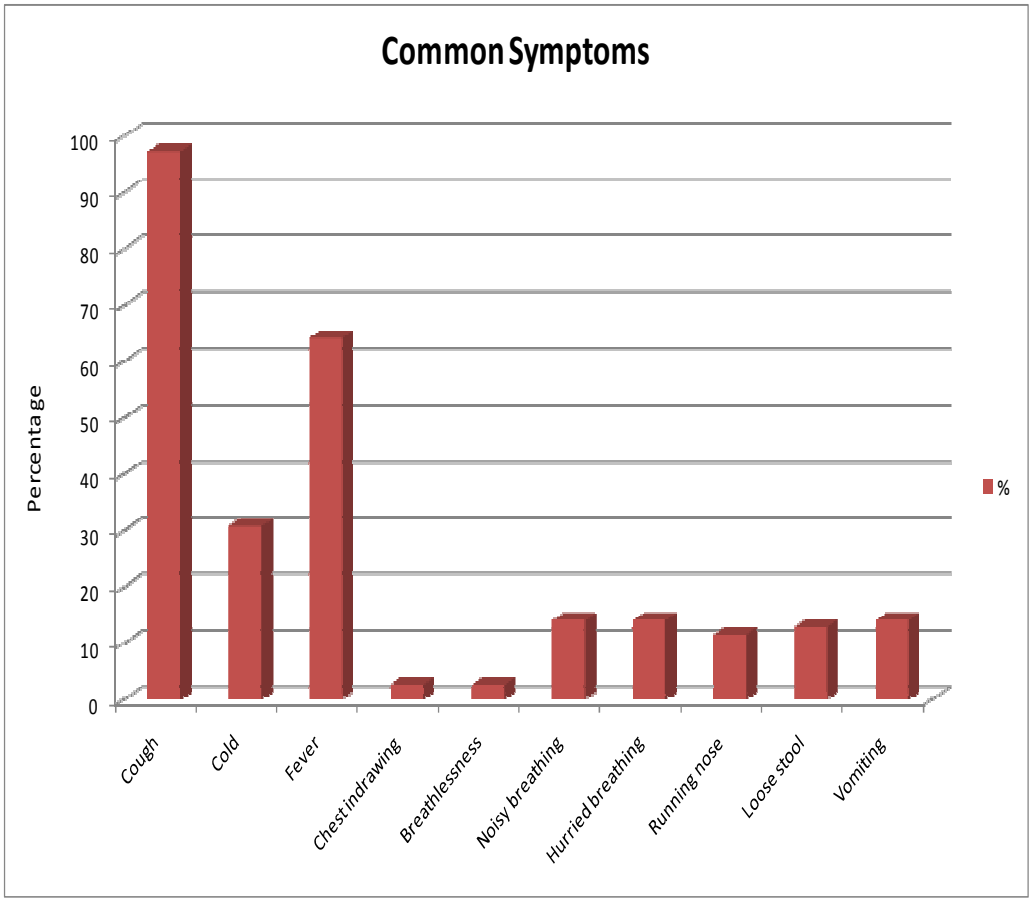

Figure 2: Bar diagram showing the common symptoms

Out of 78 patients with respiratory tract infection, 35 (44.9%) patients were diagnosed with bronchopneumonia; out of which 24 (68.6%) were incompletely immunized and 11 (31.4%) were completely immunized. 24 (30.8%) patients were diagnosed with lower respiratory tract infections; out of which 23 (95.8%) were incompletely immunized and 1 (4.2%) was completely immunized.

Table 3: Immunization pattern with respiratory tract infection

Respiratory tract infection	Immunization pattern		Total (n=78)	%
	Complete (n=20)	Incomplete (n=58)		
1.LRTI	1 (4.2%)	23 (95.8%)	24	30.8
2.LRTI with wheeze	2 (100.0%)	-	2	2.6
3.Bronchitis	3 (60.0%)	2 (40.0%)	5	6.4
4.Bronchopneumonia	11 (31.4%)	24 (68.6%)	35	44.9
5.Bronchiolitis	2 (20.0%)	8 (80.0%)	10	12.8
6.URTI	1 (50.0%)	1 (50.0%)	2	2.6
7.Aspiration pneumonia	-	3 (100.0%)	3	3.8

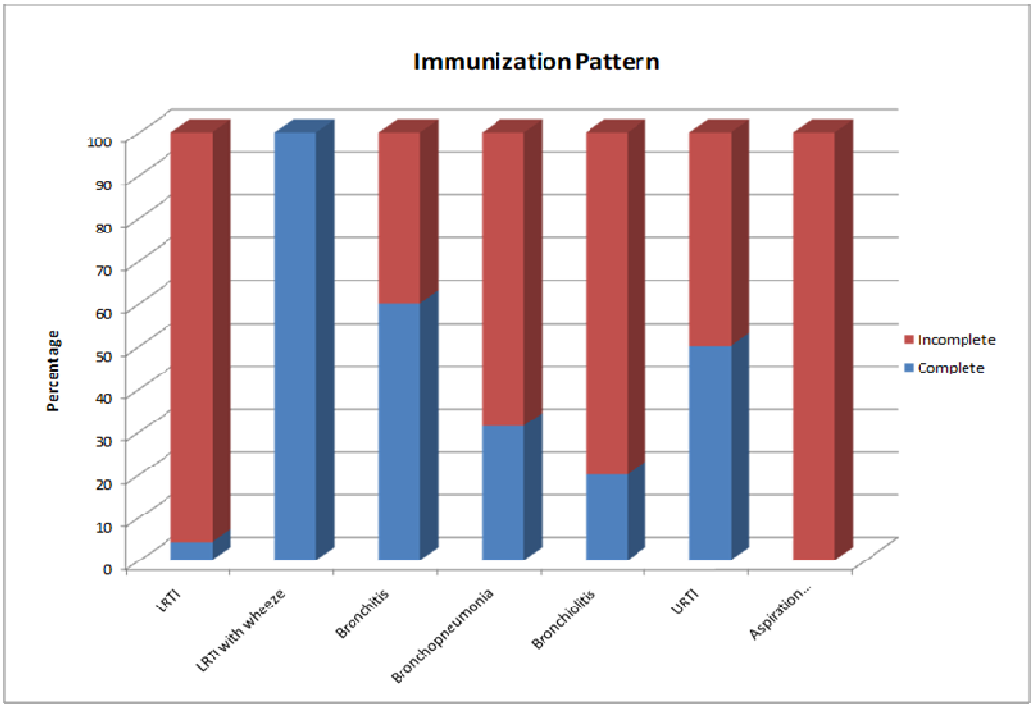

Figure 3: Bar diagram showing immunization pattern with respiratory tract infections

Among the 78 patients with respiratory tract infections, 31 (39.7%) patients were prescribed with intravenous ceftriaxone, 31 (39.7%) patients were prescribed with cefotaxime followed by 11 (14.1%) patients each were prescribed with ampicillin plus cloxacillin combination and amikacin.

Table 4: Prescribing pattern of antibiotics

Prescribing pattern (n=78)	IV	Oral
Ceftriaxone (t1)	31 (39.7%)	-
Erythromycin (t2)	-	3 (3.8%)
Gentamicin (t3)	8 (10.3%)	-
Cloxacillin (t4)	2 (2.6%)	-
Ampicillin plus cloxacillin (t5)	11(14.1%)	-
Amikacin (t6)	11(14.1%)	-
Cefotaxime (t7)	31(39.7%)	-
Cefodem (t8)	-	4 (5.1%)

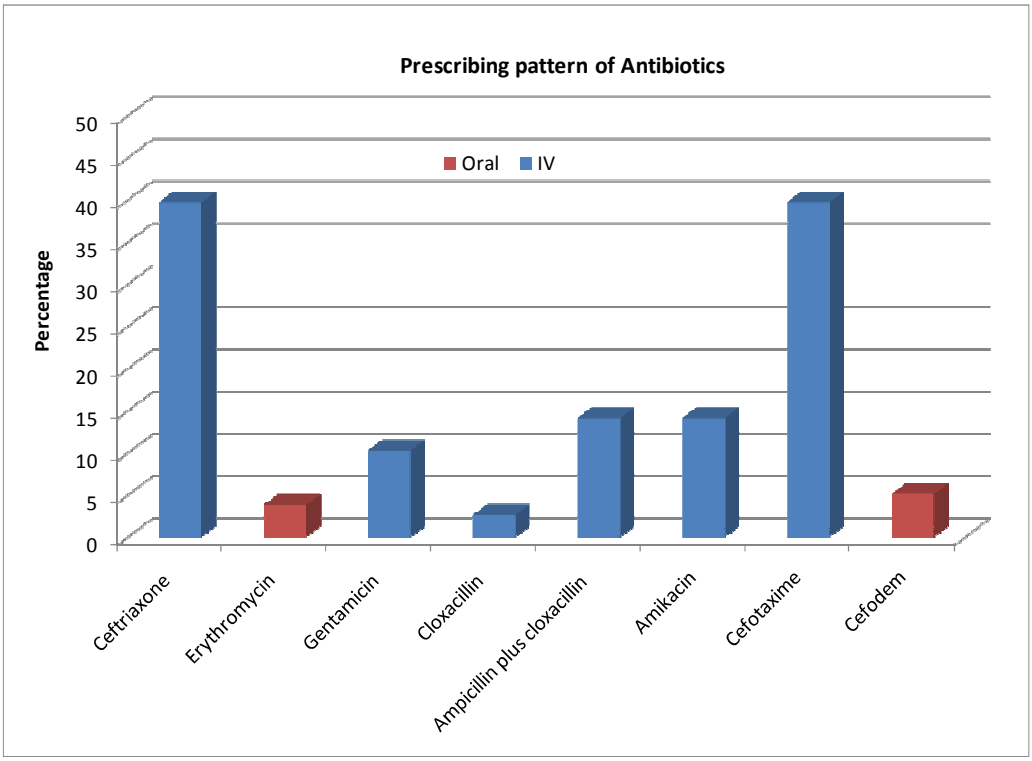

Figure 4: Bar diagram showing prescribing pattern of antibiotics

A total of 24 (30.8%) patients were admitted for lower respiratory tract infections with age ranging from 3 months to 12 years, and the commonly prescribed antibiotic was cefotaxime in 10 (41.66%) patients followed by ampicillin plus cloxacillin combination in 5 (20.83%) patients.

Out of 78 children with respiratory tract infections, 2 (2.6%) patients were admitted with lower respiratory tract infection with wheeze, the prescribed antibiotic was cefotaxime and ampicillin plus cloxacillin combination in both cases.

A total of 5 (6.4%) patients were admitted with bronchitis, with age ranging from 3.9 years – 4.6 years, and the most commonly prescribed antibiotic was cefotaxime in 4 (80%) patients.

A total of 35 (44.9%) patients were admitted with bronchopneumonia, with age ranging from 2 months-10 years, and the commonly prescribed antibiotic was ceftriaxone in 19 (54.3%) patients followed by cefotaxime in 10 (28.59%) patients.

A total of 7 (8.97%) patients were admitted with Bronchiolitis, with age ranging from 2 months to 2 years, and all the 7 (100%) patients were prescribed with ceftriaxone followed by amikacin 2 (28.6%) patients.

Among the 78 patients with ARIs, 3 (3.8%) children were admitted with bronchiolitis plus aspiration pneumonia, with age ranging from 6 weeks to 3 months. All the 3 patients were prescribed with both amikacin and cefotaxime.

A total of 2 (2.5%) patients were admitted with URTI, and only one (50%) patient was prescribed with cefotaxime.

DISCUSSION

In our study, the numbers of male patients were comparatively more than the number of females. Male patients seem to have greater susceptibility to ARIs as compared to females, which was observed in our study.

In this series, out of 78 patients with respiratory tract infections, most patients were suffering from cough followed by fever, cold and with breathlessness and chest indrawing etc.

Immunization pattern clearly indicates that the incidence of ARIs was more in non-immunized and partially immunized children when compared to immunized children.

In our study, 98.71% of the patients with acute respiratory infection were prescribed with different antibiotics, out of which the most commonly prescribed antibiotics were ceftraixone (39.7%) and cefotaxime (39.7%), followed by amikacin

(14.12%), ampicillin plus cloxacillin combination (14.1%). The antibiotics prescribed were generally administered intravenously in majority of the patients, except erythromycin and cefodem by oral route.

Out of 78 patients with ARIs, (30.8%) were diagnosed as LRTIs; (2.6%) were diagnosed as LRTI with wheeze, (6.4%) were admitted with bronchitis, (44.9%) were admitted with bronchopneumonia, (8.9%) patients were admitted with bronchiolitis, (3.8%) were diagnosed as bronchiolitis plus aspiration pneumonia and (2.5%) were admitted with URTIs. This data showed that, bronchopneumonia was the most common ARIs in children reported in our hospital.

In LRTIs, the most commonly prescribed antibiotics were cefotaxime (41.6%) and ampicillin plus cloxacillin combination (20.83%). The average cost of antibiotics prescribed in LRTI was found to be Rs. 287.35.

In LRTIs with wheeze, both the patients were prescribed with cefotaxime and combination of ampicillin plus cloxacillin. The average cost of the antibiotic therapy was found to be Rs. 431.90.

In patients with bronchitis, the commonly prescribed antibiotic was cefotaxime (80%). The average cost of antibiotic prescribed was found to be Rs. 491.

In patients with bronchopneumonia, the commonly prescribed antibiotic was ceftriaxone (54.28%) followed by cefotaxime (28.57%). The average cost of therapy was found to be Rs. 360.50.

In patients with bronchiolitis, the commonly prescribed antibiotic was ceftriaxone (100%). The average cost of therapy was found to be Rs. 470.50.

In URTI, out of 2 patients, only one was prescribed with cefotaxime (50%). The average cost of therapy was found to be Rs. 433.40. All patients with bronchiolitis plus aspiration pneumonia were prescribed with both amikacin and cefotaxime. The average cost of therapy was found to be Rs. 433.40.

These results show that the most commonly prescribed antibiotics in ARIs were parenteral ceftriaxone and cefotaxime. Among ARIs, it was found that average cost of therapy was more in bronchitis followed by bronchiolitis.

CONCLUSION

Most of the children with ARIs were found to be under the age of one-year and it was also observed that more male children suffered from ARIs than females. ARIs were most commonly seen in children belonging to the incompletely immunized patients. There is an increased susceptibility of ARIs in malnourished as well as in anemic patients. The common symptoms present were cough, cold and fever. The most commonly diagnosed ARIs were bronchopneumonia and the commonly prescribed antibiotics were cephalosporins.

REFERENCES

[1]. Shaun Mohan, Kavita Dharamraj, Ria Dindial, Deepti Mathur, Vishala Parmasad, et al. Physician. Behavior for anti-microbial prescribing for pediatric upper respiratory tract infections: Annals of Clinical Microbiology and Antimicrobials, 3(11), 2004.

[2]. Schaad UB. Prevention of paediatric respiratory tract infections: emphasis on the role of OM-85. Eur Respir Rev., 14, 2015, 74–77.

[3]. Paul S, O'Callaghan C, McKee N. Effective management of lower respiratory tract infections in childhood. Nurs Child Young People, 23, 2017, 27–34.

[4]. Gill D, O'Brien N, editors. Paediatric Clinical Examination Made Easy. London, UK: Churchill Livingston, 12, 2017.

[5]. Asscher A.W, Parr G.D, Whitmarsh V.B. Towards the safer use of medicines BMJ 1995, 1003-05

[6]. Gidal BE, Garnett WR, Graves N. Pharmacotherapy- A Pathophysiologic Approach- 5th edition The McGraw Hill Companies Inc, 5, 2002, 1031- 59.

[7]. Clark JE, Hammal D, Hampton F, Spencer D, Parker L. Epidemiology of community-acquired pneumonia in children seen in hospital. Epidemiol Infect. 135, 2017, 262–269.

[8]. Thomson A, Harris M. Community-acquired pneumonia in children: what's new? Thorax, 66, 2015, 927–928.

[9]. Dosh SA, Hickner JM, Masnous AG, Ebell MH. Predictors of antibiotic prescribing for non-specific upper respiratory infections. J Fam Pract, 49, 2000, 407-14.

[10]. Goossens H, Ferech M, Vander Stichele R, Elseviers M; ESAC Project Group. Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. Lancet. 365, 2015, 579–587.

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