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Prescribing Antibiotics by General and Specialist Physicians: A Pharmacist Administrated Survey

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This study was carried out to evaluate the pattern of antibiotics prescribed by either General Physician or specialist, mostly practiced medicine in the private sectors, in Gorgan, Located in south-east Caspian sea in the northern Iran. This research was a prospective study, using a pharmacist administrated questionnaires to record the prescribed antibiotics. The findings indicated amoxicillin, cephalexin, penicillin, with 31.4, 21 and 17.4% are among the most widely prescribed antibiotics, respectively. ENT specialist prescribed the highest rate of antibiotics (24.1%), although as whole General physicians are among high antibiotics prescribing doctors, with such rate of antibiotics prescription, an educational program, among the community health centers, especially for young physicians on the need for antibiotics therapy and risk factors associated with increase rate of antibiotic resistant organism are suggested.

Key words: Antibiotics, pharmacist, General physicians, specialist doctors, ENT

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INTRODUCTION

Antibiotics are among the medicines, which are widely used in either treatment or as a preventative measure to combat infections. Antibiotics are being used since the discovery of penicillin, the clinical consumption of antibiotic with production of synthetic and semi-synthetic are among the medication that widely are being practiced in clinical medicine and are among the drugs which are being used in many part of the world, from developed and developing countries (Calva and Bojalil, 1996; Bojalil *et al*., 1993; Bojalil and Calva, 1994). Some antibiotics are among the most prescribed classes of drugs in practicing medicine.

Knowledge of potential side effect, considered in the light of various patients, associated factors, underlying diseases, drug allergies and co-administered drugs, important in order to minimize the risk of adverse reaction of antibiotic (Cerny, 1996). Antibiotic overuse and particularly in children is wide spread and it is fuelled by public attitudes and expectation, therefore the knowledge, beliefs and the antibiotic practice is matter of importance in medicine. Antibiotics are used some time without the supervision of either health clinic or a physician (Hedin *et al*., 2006; Taylor *et al*., 2005). The other important issue is the antibiotic misuse, which is a common practice among some people around the world, without the understanding the side-effect correlated with the consumption of such a chemicals (Hem *et al*., 2005). In developing countries, antibiotic are the most common drugs sold and some data suggest that they are frequently misused (Huang *et al*., 2005), widespread overuse and in appropriate use of antibiotic are a major of public health concern, even in well developed countries (Mangione-Smith *et al*., 2004). On the basis of statistical report, antibiotics are among the most widely used drugs in Iran, various forms of antibiotic are being sold. Antibiotics constitute more than one fourth of all drugs used in this country. Their irrational use of antibiotics is incriminated for the escalating antimicrobial resistance problem world wide (Molstad *et al*., 1990; Parimi *et al*., 2004). The aim of this study was to investigate the pattern of antibiotics prescribed by the General and specialist doctors within the medical practice in Gorgan, the capital city of Golestan province in the north of Iran.

MATERIALS AND METHODS

This one-year study was a prospective research project and was conducted on 880 prescribed antibiotics in 2001, examining the pattern of antibiotic, prescribed by the either General physicians or specialist doctors. The specialty of specialist doctors participated in this study were as follow, Ear Nose Throat (ENT), Pediatrician, Internalist, Gynecologist, Surgeon, Dermatologist, Ophthalmologist, Orthopedist, Urologist, Cardiovascularist. For this purpose an observational, cross-sectional study was conducted in Gorgan the capital city of Golestan province in the south-east of Caspian sea in the north of Iran. The patterns of prescribed antibiotics by the physicians were surveyed, using a pharmacist administrated questionnaires in pharmacy departments in Gorgan, by careful examination of the prescriptions.

The main questions in the questionnaires were the type of antibiotics prescribed by the General physicians and specialist doctors and the number of prescribed antibiotics, whether they were one, two, three or four different types of antibiotics.

The data presented in this study, indicated the total amount of drug prescribed by the group of doctors of the same specialty. The numbers presented in the tables, are not the mean value and merely reflect either the number of physicians or the antibiotics of items prescribed in this study. In this investigation the data were considered to be significant when the antibiotic themselves were highly prescribed, regardless they were prescribed by General Physicians or specialist doctors.

RESULTS

The antibiotics which were mainly prescribed by the doctors regardless of whether they are General physicians or specialist are presented in Table 1.

General physicians and specialists prescribed different types of antibiotics which is summarized in Table 2.

The specialist doctors according to their specialty prescribed some particular antibiotics (Table 3). The main

Table 1: The ratio of prescribed antibiotics by the General and specialist physicians

Antibiotic	Antibiotic No.	Antibiotic (%)
Amoxicillin	276	31.4
Cephalexin	185	21.0
Penicillin-G	153	17.4
Co-trimaxozole	111	12.6
Gentamycine	93	10.6
Erythromycine	73	8.3
Ampicillin	60	6.8
Co-amoxiclave	43	4.9
Tetracycline	29	3.3
Penicillin-V	15	1.7
Chloramphenicol	8	0.9
Others	181	20.6
Total	880	100.0

Table 2: The partial distribution of various prescribed antibiotics prescribed by the General and specialist physicians

Antibiotic	Specialist (%)	General physician (%)
Penicillin-G	47.8	52.2
Penicillin-V	85.7	14.3
Amoxycillin	44.1	27.6
Ampicillin	43.6	56.4
Cephalexin	49.3	50.7
Gentamycine	53.5	64.5
Co-trimaxozole	43.2	56.8
Co-amoxiclave	51.5	48.5
Tetracycline	51.5	48.5
Erythromycine	40.9	59.1
Chloramphenicol	40.9	59.1
Other antibiotics	41.9	50.9

Table 3: The percentage of antibiotics prescribed by different specialists

Specialist	Antibiotics (%)
ENT	24.1
Pediatrician	20.7
Internalist	12.7
Gynecologist	12.0
Surgeon	9.0
Dermatologist	6.7
Ophtalmologist	3.3
Orthopedist	0.7
Urologist	0.7
Cardiovascularist	0.3
Others	2.0

Table 4: The numbers of antibiotics items prescribed by physicians in each prescription

Antibiotic item	Antibiotic No.	Antibiotic (%)
1	554	63.0
2	306	35.7
3-4	20	2.3
Total	880	100.0

Table 5: The number of drug items prescribed by physicians in each prescription

Drug item	Prescription No.	Prescription (%)
1	25	3.7
2	108	16.2
3	178	27.0
4	173	26.0
5	101	15.2
6	57	8.5
7	16	2.4
8	4	0.6
9	3	0.4

observation from (Table 3) regardless of the type of antibiotic was the high rate of antibiotics prescribed by the ear, nose, throat (ENT) specialist, with 24.1% of all the prescribed antibiotics, the pediatrician with 20.7% and internal specialist with 12.7% are among the doctors which prescribing the highest rate of antibiotics. 88.3 and 11.7% of all antibiotics prescribed by male and female doctors, respectively, 98.2 and 1.8% of all antibiotics are prescribed by doctors within the town and the villages around Gorgan, respectively. The reasons for these observations can be due high number of male doctors and the presence of more physicians practicing medicine in the towns. The number of antibiotic items whether it was a prescription with one item (63%), two items (35.7%) and three to four items (2.3%) were presented in (Table 4). If three-four antibiotic items were prescribed. then the number of female patients whom taken the antibiotics were twice of male patients.

The number of prescriptions issued with one to nine drugs were also presented in (Table 5).

DISCUSSION

The results obtained out of this present investigation indicated that the antibiotics were highly prescribed by either the specialist doctors or General physicians and it seems that antibiotics prescribing is very common among the community based medical doctors in this region. Whether they are General physician or specialist. This findings some how are similar to the study in other part of the world such as Brazil (Molstad *et al*., 1990) and USA (Parimi *et al*., 2004).

In this study the amoxicillin, cephalexin and penicillin were among antibiotic, which were mainly prescribed by the specialist physicians. These finding are similar to a study in Norway, where it was seen that broad spectrum antibiotics are often prescribed for diagnoses where penicillin was recommended to be a the first choice. In this study we found the antibiotic Co-trimaxozole, was also highly prescribed by the specialist, but when we analyzed the antibiotic prescribed by the specialist and General physician we realized that, penicillin-V and gentamaycine were highly prescribed. Present findings indicated that the antibiotics are presents in the prescription ordered by the either physicians.

Among the specialist physicians, the ENT specialist, Paediatrician, Internalist and Gynecologist, prescribed the highest level of antibiotics, respectively. Other specialists also prescribed the antibiotic but in smaller scale.

In this study it has been noticed that the Pediatrician were the second in prescribing the high level of antibiotics (20.7%). In a study in Norway on drug prescribing for children age up to 12 years in General practice, it was shown that drug prescribing pattern for children, was a subject for investigation, it was found that various antibiotic were prescribed in different illneses among children, it was reported that antibiotic were prescribed in more than 80% contacts for tonsillitis, sinusitis, acute bronchitis and pneumonia and in two-thirds of all contacts for urinary tract infections (Parimi *et al*., 2004), phenoxymethyl penicillin, was the most frequency prescribed antibiotic in children, the other antibiotics which were used in the above study were erthromycine and co-trimoxazole, but in this study although the penicillin was one of the most widely used antibiotic, the other antibiotics mostly prescribed were

amoxicillin, Cephalexine, co-trimoxazole. Amoxicillin was also an antibiotics with no reduction in its use even after intervention, in south Australia (Dollman *et al*., 2005). Control of antibiotic therapy in pediatric patients was assessed in a study in Italy, it was shown that out of 314 prescription, 56.1% were assessed as adequate, 4.1% as justifiable and in 39.8% as not justified (Principi *et al*., 1981).

The efficacy of antibiotic therapy for nasopharyngitis, upper respiratory infections and bronchitis, are also a matter for investigating (Straand *et al*., 1998a, b). In this study also the ENT specialist were among the physicians with highly antibiotic prescribing doctors, which are partly similar to the above studies.

In a similar study to this research project which was carried out in Sweden, all prescriptions for antibiotics dispensed in half of the pharmacist in the Malmohus county, which accounted for the highest prescription rate, the amount and proportion of erythromycine and tetracycline prescribed were particularly large (Stone *et al*., 2000), but in this study, amoxicillin, cephalexine and penicillin-G were among the highly prescribed antibiotics. It seems logical that other specialist such as Gyneocologist, Internalists, Surgeons prescribe either for treatment or preventing the infections (Chamany *et al*., 2005), but what important is the rational use and the real need for a such treatment, which is the main questions in the minds of many researchers working in these field of studies. The other findings from this study explained that among the 880 prescribed antibiotics, broad spectrum antibiotic were more frequent in urban (98.2%) than in rural (1.8%) area and were most often prescribed by private practionairs. These findings partly were similar to a study in Sweden (Stone *et al*., 2000; Davey *et al*., 2005). In this study we assumed the reason for this big difference can be due to large number of urban physicians than the rural area. The other findings in this study indicated that the male and female physicians in this study prescribed 88.3 and 11.7% of all antibiotics, respectively, the reason for this observation may also be due to the higher number of male physicians in this region. In this study the number of male and female patients referred to the physicians almost were equal, but it should be mentioned that this equality were in prescription with, one drug item (63.9%), two items (35.7%), but in female patients with three to four drugs prescribed drug items. Then the female patients had taken twice antibiotic than male subjects.

From 880 antibiotics examined in this study, the scale of antibiotics prescribed by the General physician, were equal to specialist which is a matter for further investigations. These finding, are similar to a study in Oslo which concentrated, on the self-prescribing among young Norwegian doctors which showed that the level of self-prescribing by young Norwegian physicians was relatively high and this behavior is established early in their professional lives (Zhang *et al*., 2005).

The conclusions out of this present study can be summarized as follow:

- An educational program on the use of antibiotic, should be initiated among district physician at the community heath centers.
- Although self prescribing is acceptable in some situations, by young physicians more rational help-seeking behavior should probably start in medical school. It should be added that a reduction in antibiotic usage for infections, can be achieved without changing the indications for antibiotic treatment.
- Antibiotic use is associated with increase rate of antibiotic resistant organisms, therefore inadequate knowledge, misconceptions on antibiotic use and unnecessary antibiotic prescription pave the way for microbial resistance in the community, which should be avoided by a proper guildlines for antibiotic prescription and consumption in the society.

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