ORIGINAL ARTICLE

Prescribing pattern and Drug indicators in Patients Visited by General Practitioners and Specialists in Ardabil City of Iran

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ABSTRACT

Drug is an important and strategic commodity and a basic need of the people in all countries. The aim of this study is to determine the drug use patterns and descriptive analysis of prescriptions of doctors in Ardabil city of Iran. A retrospective study was carried out on 2000 randomly-selected prescriptions. Data were obtained on demographics, prescribing indexes and analyzed by descriptive statistical methods by SPSS software. Of the 2000 prescriptions, 822 (41%) and 1178 (59%) were for men and women, respectively, by a female to male ratio of 1:0.69. The mean age of the patients was 31.6 ± 21.3 years, ranging from one to 91. 1306 (65.3%) of all prescriptions were for general practitioners and the rest for specialists. The average number of drugs per prescription was 3.58 ± 1.3, ranging from 1 to 9 drugs. Dexamethasone (219, 24.7%) was the most frequently-prescribed medicine. Results demonstrated that the average number of drugs per prescription and the rate of prescribing injectable drugs were more than world standards and it is necessary to reduce these indexes and irrational use of drugs through interfering with patients' belief and physicians' attitudes.

Drug utilization research was defined by WHO in 1977 as "the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic Consequences". Epidemiology is defined as "the study of the distribution and determinants of health-related states and events in the population, and the application of this study to control of health problems". Drug utilization research may also be divided into descriptive and analytical studies. Drug utilization research is thus an essential part of pharmaco-epidemiology as it describes the extent, Nature and determinants of drug exposure. Drug utilization research and pharmaco-epidemiology may provide insights into the following aspects of drug use and drug prescribing [1]. Medicine is an important and strategic commodity and a basic need of the people in all countries. Drug prescribing for older patients is one of the main challenges because they are three times more medications [2-3]. Medical and pharmaceutical services are one the main and expensive needs of people. These two specifications make them be so significant that creation of a rational pattern in utilizing medical and pharmaceutical resources is a national necessity. According to current estimations, more than 300 million prescriptions are annually dispensed in Iran. The average number of drugs per prescription, as obtained from statistical analysis, was 3.26 in 2010, showing a significant difference with world average (near 1.5) [4-6]. Of these prescriptions, antibiotics, injectable drugs, and corticosteroids, as the three most important drug categories, are ordered for 54%, 44%, and 32% of patients, respectively. Drug utilization pattern is an important factor determining the effectiveness of a health providing system. In Iran, most of prescribed drugs are antibiotics, analgesics, and anti-inflammatory drugs. Antibiotics are prescribed for 25%

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Table 1. Indexes of drugs by the insurance organization and specialty

Specialty	Mean		SD		No. of prescriptions	
	Ta'min Ejtemaei	Khadamat Darmani	Ta'min Ejtemaei	Khadamat Darmani	Ta'min Ejtemaei	Khadamat Darmani
G.P	3.75	3.8	1.2	1.3	652	654
Neurologist	2.88	3.5	0.8	1.6	16	16
Gynecologist	2.61	2.6	1.1	1	56	47
Orthopedist	3.85	3.66	0.9	1.6	41	29
Internist	3.65	4.1	1.3	1.1	17	19
Pediatrician	2.78	3.11	0.9	1	41	38
Ophthalmologist	2.82	2.8	0.9	1	11	21
Psychiatrist	3.8	3.83	1.4	1.2	15	23
Dentist	2.86	2.68	1.2	1	35	23
Midwife	4.24	3.62	1.6	1.5	25	16
Others	3.2	3.19	1.5	1.7	91	114
Total	3.55	3.6	1.3	1.4	1000	1000

and 30% of patients in Europe and the U.S., respectively, but this number is always more than 50 in Iran; nevertheless infectious diseases are not a major health problem in Iran. The irrational use of drugs and self-medication may result in many health problems for patients, such as increasing the risk of adverse drug reactions, late diagnosis and prolongation of illness, patients' dissatisfaction, affecting patient-physician relationship, and finally raising the cost of treatment [6-8]. According to WHO statistics, Iran is among the 20 most drug-utilizing countries with secondary rank in Asia after China. Annually, each Iranian person uses 339 drugs which is about twice the world standards, leading to spend a large part of health resources for procurement of drugs required. Antibiotics are the 4th or 5th most prescribed drugs in Iran. Adding non-prescription sold antibiotics will move this position higher. Official statistics published by Ministry of Health showed that the average number of medications per prescription was more than 3 and it is now nearly 3.6, compared to less than two drugs per prescription of world average. Drugs are the basis of nearly 75% of treatments; therefore it is necessary to improve general information about commonly-used medications, especially the importance and indications of antibiotics, corticosteroids, and injectable drugs [9]. Published statistics in Iran showed that the rate of drug use growth is higher than world and industrial countries such as the U.S., U.K., Germany, France and Japan. The aim of this study is to determine pattern of drug utilization in patients visited by general practitioners and specialist in Ardabil, Iran.

MATERIALS AND METHODS

This is a retrospective cross-sectional descriptive study that has been done on 2000 prescriptions, randomly selected from all archived prescriptions. The selection is done by season in each insurance organization. Information was analyzed by descriptive statistical methods in SPSS.

RESULTS

The average number of drugs prescribed for males was 3.57 (SD = 1.3) and females 3.58 (SD = 1.3). In all prescriptions, 822 (41%) and 1178 (59%) were for males and females, respectively. Mean of the patients' age was 31.6 (SD = 21.3) ranging from 1 to 91 years. The average number of drugs per prescription, separated by the insurance organization and specialty is presented in Table 1. Number of drugs per prescription was ranging from 1 to 9. In Ta'min Ejtemaei organization prescriptions, midwifes and gynecologists had the maximum and minimum number of drugs per prescription, respectively. Also, in Khadamat Darmani organization prescriptions, internists and gynecologists had the maximum and minimum number of drugs per prescription, respectively. Of all 7158 prescribed drugs, 894 (12.5%) drugs were injectable and the rest were other drug forms. Of all prescriptions, 890 had at least one injectable drug, indicating that 44.7% of the patients had received injectable drugs (Table 2). Of all prescriptions, 544 (60.9%) have one injectable drug, 271 (30.3%) have two injectable drugs and 79 (8.8%) have more than two injectable drugs. Between general practitioners and orthopedists, injectable drugs were more than others, with 59% and 4.9%, respectively. Antibiotics, CNS and immune system drugs were the most frequently-prescribed categories in patients; 52.8%, 33.1% and 30.4%, respectively (Table 3).

DISCUSSION

Studying Iran's drug utilization in recent ten years showed that the mean growth of drug costs is annually more than 25%. Ninety percent of subsidization of drugs is allocated for imported drugs. In other words, the mean growth of drug costs for the imported drugs is more than 70%. In Iran, the cost of prescribed antibiotics is more than 41% of first thirty commonly-prescribed drugs. In this study, antibiotics and injectable

Table 2. Top 10 prescribed injectable drugs by specialty

Specialty	Injectable Drug										
	Dexamethasone	Penicillin 6.3.3	Dexame-thasone	Betame-thasone	Metoclo-pramide	Hyoscine	Ceftriaxone	Penicilliin 800,000 IU	Combinatio n	Normal Saline	Total
G.P.	187 (85.4%)	157 (94%)	79 (98%)	51 (65.4%)	75 (96.2%)	46 (74.2%)	55 (95%)	44 (78.6%)	44 (93.6%)	39 (91%)	777 (87.3%)
Neurologist	2 (1%)	-	-	1 (1.3%)	-	1 (1.6%)	-	-	1 (2.1%)	-	6 (0.7%)
Gynecologist	2 (1.9%)	1 (1%)	-	1 (1%)	1 (1%)	-	-	-	-	-	5 (0.6%)
Orthopedist	-	1 (0.6%)	-	18 (23.1%)	-	-	-	-	-	-	19 (2.1%)
Dentist	16 (7.3%)	3 (1.8%)	-	-	-	-	-	8 (14.3%)	-	-	27 (3%)
Pediatrician	-	2 (1.2%)	2 (2.5%)	1 (1.3%)	1 (1.3%)	-	-	1 (1.8%)	-	1 (2.3%)	8 (0.9%)
Internist	2 (1%)	-	-	-	-	-	-	1 (1.8%)	-	1 (2.3%)	4 (0.5%)
Midwife	5 (2.3%)	-	-	-	-	8 (13%)	1 (1.7%)	-	1 (2.1%)	-	15 (1.7%)
Others	5 (2.3%)	3 (1.8%)	-	6 (7.7%)	-	7 (11.3%)	2 (3.3%)	2 (3.6%)	1 (2.1%)	2 (4.6%)	28 (3.1%)
Total	219 (24.7%)	167 (18.8%)	81 (9%)	78 (8.8%)	78 (8.8%)	62 (7%)	58 (6.5%)	56 (6.3%)	47 (5.3%)	43 (4.8%)	888 (100%)

drugs were prescribed for 52.8% and 44.7% of patients which are more than a study in Tehran (1999) with 43% and 39%, respectively. The average number of drugs per prescription was 3.6 which is more than a study in Tehran with 2.58 [10]. These numbers indicate the irrational pattern of drug use for outpatients. Considering the increasing number of drug-resistant organisms, this high rate of irrational use of antibiotics will burden higher costs of new generations of antibiotics and may disarm health professionals in treating infectious diseases. The rational use of drugs, especially antibiotics, should be initiated by physicians, as the authorized group of drug prescribers. It may need much more time to change the patients' attitude, as the drug consumers [11].

Lack of the community awareness about the effects and side effects of medications can be the cause of many health problems for patients and also high health care costs for families and society. There are many medical conditions which basically are not considered as disorder and do not need any drug. Expecting a drug prescription is one of the patients' most important problems, especially when the patient is a child. Health recommendations are hardly accepted by patients and parents. Some patients believe that pain and/or fever always are the symptoms of an infection and always misuse antibiotics to relieve these symptoms. They may obtain the antibiotics directly from pharmacies (self medication) or insist on their physicians to prescribe it. There is not an exact estimation of what percent of the requests are accepted by physicians.

The results represent the irrational use of drugs among patients in Ardabil. There are many factors which directly or indirectly have an effect on drug utilization. Lack of the community awareness is the basis of the problem. As a matter of fact, until the patients' knowledge of drugs are not improved and drugs are not considered as potentially-harmful substances which always need a careful prescription only by a physician, the incorrect cycle of irrational drug use will not cease. Patient-physician monetary relationship, non-perceptional drug sale, absence of a smart system of controlling drug sale and utilization are secondary effective factors in irrational drug utilization in Iran.

Table 3. Distribution category of prescribed drugs

Category	Number	Percent
Antibiotics	1055	52.8
CNS Drugs	662	33.1
Immune System Drugs	609	30.4
Herbal Drugs	559	28
Corticosteroids	529	26.4
GI Drugs	411	20.6
Respiratory Drugs	401	20
Antihistamines	381	19
Topical Drugs (eye/ear)	219	11
CVS Drugs	128	6.4
Dermatology Drugs	112	5.6
Genitourinary Drugs	86	4.3
Modifiers	83	4.2
Food Supplements	33	1.6
NSAIDs	17	0.8
Others	219	11

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