Evaluation of Drug Prescription Pattern among General Dental Practitioners in Rasht, Iran

Original Article

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Abstract

Introduction: Irrational drug prescription is a controversial issue around the world that interferes not only with the patient's life but also with the society and economy. Despite few studies, there is no enough data on the prescription habits of dental practitioners. So, we aimed at evaluating the same issue in Rasht, Iran.

Materials and Methods: This cross-sectional retrospective study; reviewing a convenience sample of 850 dental prescriptions selected randomly from social insurance prescriptions; assessed for two parameters: The first for WHO drug indicators such as the mean number of drugs per prescription, the percentage of durgs with generic name, the percentage of prescription with antibiotics and injectives, and the second for the prescription errors. Chi-sqaure test was used for analyzing the data.

Result: The average number of drugs per prescription was 2.64±0.85. Drugs with generic names constituted 82.9%. 93.8% of prescriptions had at least one antibiotic, whereas 26% had injectives. Combination of antibiotics and NSAIDS (Non-steroidal anti-inflammatory drugs) were the most common prescribed drugs. The mistakes related to drug form, name, quantity, dose, dose interval as well as route of administration were 18.4%, 22.5%, 16.5%, 14%, 39.6%, 94.9% respectively. Average number of drugs, percentage of antibiotics and injectives per prescriptions, mistakes in drug quantity, dose interval and route of administration were lower in prescriptions of female prescribers than in males.

Conclusion: Polypharmacy, overuse of antibiotics and prescription errors among the prescriptions of dental practitioners were common. Continuous training of dentists would be necessary to improve the quality of prescriptions.

Key words: • Dentists •Drug •Prescription

Introduction

Drug therapy is the most commonly used method of any disease treatment in general practice.[1] Rational drug prescription is defined as using the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost. Accurate diagnosis, proper prescription, correct dispensing, suitable packing and patient adherence are the five important criteria to achieve the rational drug use. Inappropriate drug prescription is a phenomenon around the world[2] Its consequences include ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher costs.[3] According to the National Coordinating Council for Errors in Medication Reporting and Prevention (NCCMERP), a medication error is defined as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in control of the health care".[4] In the last few years, medication errors have been reported to have caused significant patient harm in many different countries. In the USA, it is estimated that 1–2% of hospital admissions resulted from medication errors.[5] The incidence of prescribing errors in the United States has been reported to range from 3 to 99 errors per 1,000 in medication orders.[6] Although, a number of studies have been undertaken to study the drug prescription pattern of physicians, but the data is scarce on the dental practitioners'.[7] Since sound prescription is one of the important criteria in achieving rational drug use, in this study we aimed to evaluate the prescription pattern of general dental practitioners in Rasht, 1390.

Materials and Methods

This cross-sectional retrospective study was conducted by reviewing a randomly selected eight-hundred-fifty social insurance dental prescriptions in winter 1390. The data of each prescription such as, the patients' age, sex, the number of drugs per prescription, drug form, name, dose quantity, interval, route of administration, the group of drugs and the sex of the dental practitioners were recorded to a questioner. The prescriptions were assessed for two parameters: The first, for WHO drug indicators such as the mean number of drug per prescription and the percentage of drugs prescribed with generic name. Secondly, for prescription errors as follows: error in drug form (the form not written or written by mistake), error in drug name (the name written incorrectly), illegibility, error in drug dose, interval and quantity (the dose not written or written incorrectly according to "Comprehensive Dictionary of Clinical Drugs of Iran and the World"[8]), and finally error in route of administration. The data was analyzed by Statistical Package for Social Sciences (SPSS 19). Chi-squared test was used for any significant differences between the two groups of prescribers.

Results

The numbers of male patients were 348 (40.95%) and the remaining (50.05) was female. The mean age of patients was 35.26±14.76. The drug number per prescription was 2 in 43.05% and 3 in 35.76%. The average number of drugs per prescription was 2.64±0.85. There was a significant difference between the male and female prescribers in this study (P<0.001). There were errors in 97.2% of the studied prescriptions with significant differences between the two groups of dentists (p<0.012). The error in drug form was 18.48%. In this index, errors mostly had to do with gelofen, amoxicillin and co-amoxiclave. Errors in drug name constituted 22.5% which were mostly in the name of amoxicillin followed cefexim and drug quantity did 16.59%.

The prescribers made more mistakes in the number of amoxicillin, metronidazole, penicillin V, co-amoxiclave and chlorhexidine. Regarding the drug dosage, the results showed that the error in dose of chlorhexidine, acetaminophen, and acetaminophen-codein was 14%, more than others. The prescribers had errors in dose interval in 39.6% of prescriptions. There were more errors in dose interval of gelofen, acetaminophen, and with lower percentage in acetaminophen-codein. The most errors were seen in the route of administration of oral drugs which was 94.9%. There were significant differences in

errors in drug quantity, dose interval and route of administration between the two groups of prescribers.

The most drugs prescribed by general dental practitioner were antibiotics(54.1%), analgesics(33.7%), mouthwashes(7.1%), corticosteriodis(4.1%) and other drugs(1%).

Amoxicillin followed by metronidazol, penicillin 800000, penicillin v, and co-amoxiclave were the most common prescribed antibiotics.

Analgesics were classified in four groups including NSAIDs, narcotics, non-narcotics and combinations. Gelofen and ibuprofen in NSAIDS, acetaminophen-codein in narcotics, acetaminophen in non-narcotics, and novafen in combination groups were prescribed more than the others. Chlorhexidine was the most prescribed drug in mouthwashes, and dexametazone in corticosteroids.

Table1. The frequency of the number of drugs per prescriptions of general dental practitioners

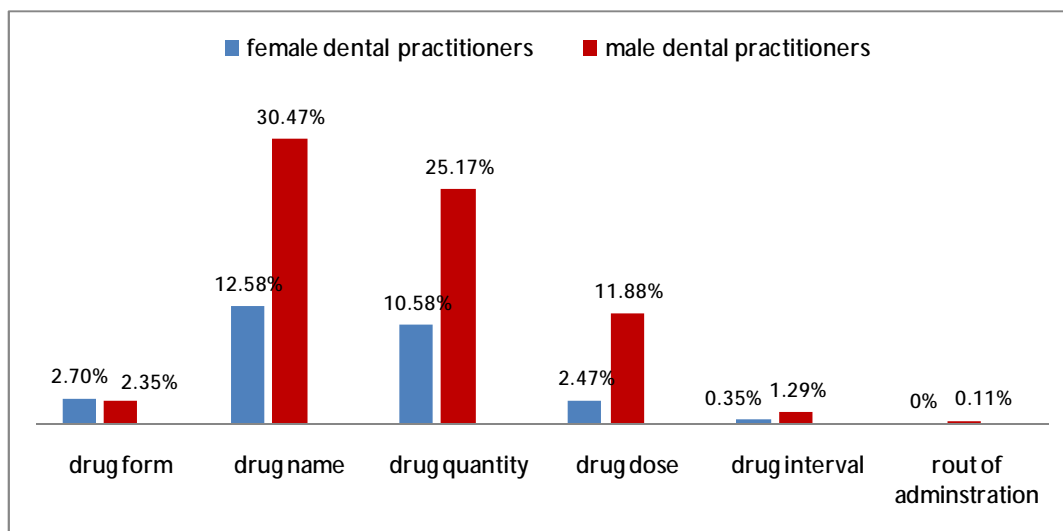| Number of drugs \ Dental	1	2	3	4	5	6
Female dental practitioners	23 2.7%	107 12.58%	90 10.58%	21 2.47%	3 0.35%	0 0%
Male dental practitioners	20 2.35%	259 30.47%	214 25.17%	101 11.88%	11 1.29%	1 0.11%
Total	43 5.05%	366 43.05%	304 35.76%	122 14.35%	14 1.64%	1 0.11%

Figure 1. The frequency of different error types in prescriptions of general dental practitioners

Table 2. The frequency of three WHO drug indicators in prescriptions of general dental practitioners (DPs) in Rasht

Index	Dental practitioners (DPs) F%	Male (DPs) F%	Female (DPs) F%	P value
The percentage of prescriptions with antibiotics	93.8	67.4	26.4	0.000
The percentage of prescriptions with injections	26	19.2	6.8	0.000
The percentage of drugs with generic name	82.8	66.6	16.2	0.560

Discussion

Rational drug prescription is considered as a crucial aspect of healthcare policies in each country, because of its influence on patients, society and its economy. The results of this study revealed that most of the dentists prescribed 2 and 3 drugs per prescription. The mean number of drugs per prescription was 2.64+0.85. There was a significant difference in the mean number of drugs between the male and female prescribers. It was found that males prescribe more drugs than females. The result of our study was higher than the results of 0thers [9,10], and lower than salman et al.[7] Nezafati et al.[11] reported that dentists in Tabriz prescribed 2 and 3 drugs in 76.2%, which was similar to our finding. While the WHO guidelines on rational use of drugs had reference values of 1.6-1.8 per encounter[3], the average of 2.64 drugs per prescription, in this study, is comparatively high (polypharmacy). No doubt, a high number of drugs prescribed for a patient increase the risk of drug interactions. [3] In our study, 97.2% of prescriptions had errors that was similar to that of Nezafati et al.[11] Also, 18.8% of prescriptions had errors in drug form that was higher than Nezafati et al.[11] (5.3%) and Mendonca et al.[12] reports (2.7%). In fact, more errors were seen in the form of new drugs and drugs with multi-forms.[12] Regarding drug name, 22.5% of prescriptions had error. Nezafati et al. [11] reported this error in 94.9% that was higher than ours. Errors about drug quantity were observed in 16.5% of prescriptions that was much less than that of Irshad et al. (94%). [13] The errors in the quantity of amoxicillin, metronidazole, and penicillin V, co-amoxiclave were more than other drugs. Similar to Gómez-Oliván et al.[15], 14% of prescriptions had error in drug dose but less than Mendonca et al.(67%)[12], Nezafati et al. (60.8%)[11] and Patel et al .[14] Others were related to dose interval which constituted 39.6% of prescriptions surpassing Gómez-Oliván et al. (11.61%)[15], but less than Mendoncha et al (35.7%) [12] Study. The error in dose interval of analgesics was seen in 94.9% of prescriptions. It was higher than Mendonca et al. (58.9%)[12] but similar to Nezafati et al.

(94.8%).[11] Most of the errors in route of administration were seen in oral drugs (80.71%) similar to Nezafati et al.[11] Patients need information, instructions and warnings in order to appreciate the therapy and take the drugs correctly. Information should be provided clearly, in everyday language and the patients should be asked to repeat some of the "core information" [16] Pattern of antibiotic prescription had showed significant differences between the two groups of prescribers. The males prescribed more antibiotics than female groups. Antibiotic prescribing may be associated with unfavorable side effects, ranging from gastrointestinal disturbances to fatal anaphylactic shock and development of resistance.[17] Prescribing antibiotics without laboratory validation for its indication promotes multi-drug resistance of microbes which in turn result in using highly potent antibiotics for otherwise mild bacterial infections.[1] In this study, drug usage in the form of injection was found to be 26% that was higher than Patel et al. (5.3%) [14], similar to Adebayo et al. (24%) [18] and lower than babalola et al. (72.7%).[1] It is claimed that some patients believe injections are more potent than oral forms of drugs, hence they request doctors to prescribe them. Injections are probably popular in the third world because the syringe and needles are seen as symbols of western medicine.[18] Therefore, there is an urgent need to reduce injection use in order to prevent injection-related hazards and infections such as HIV/AIDS, tissue necrosis, hepatitis, and pain.[1] While WHO expects a 100% prescription of drugs in generic names[3], only 82.9% of drugs were prescribed in this fashion. WHO encourages the use of generic analogue of drugs, as they are cheaper than branded substitutes and have similar effect.[18] Our results in this index were better than Babalola et al. (69.8%)[1], Adebayo et al. (49.3%)[18], Mendonca et al. (66%)[12] , Sarkar et al. (21%) [19] and Salman et al. (4%).[7] Amoxicillin followed by metronidazole, penicillin 800.000, penicillin V, coamoxiclave were the most common prescribed antibiotics respectively. Salako et al.[20], Mendonca et al.[12], Nezafati et al.[11], reported, amoxillin as the most common anti-

biotics. NSAID$_S$ such as gelofen, ibuprofen was prescribed more than the other analgesics in our study. Baghaei et al.[21], Mendonca et al.[12], Sermet et al.[16] reported that the most common prescribed NSAID$_S$ in their study were ibuprofen, diclofenac and naproxen, respectively. Although NSAIDs, are the most commonly chosen drugs for dental pain management, as they can cause fluid and sodium retention(which is an important risk especially in patients with hypertension), allergic reactions, post-operative bleeding and a variety of serious drug interactions. So, these drugs should be used cautiously especially in elderlies and patients with renal and/or cardiovascular diseases.[16] In this study, similar to Sarkar et al.[19] acetaminophen-codein was prescribed widely. The mean percentage of patients receiving corticosteroid drugs was 4.1%, lower than Safaeeian et al. (26.7%)[22] and Amin et al.[23] findings (67%). Unfortunately, corticosteroids are over-prescribed and often given without indication in Iran during recent years. Various side effects are associated with steroids use and corticosteroids should be avoided when effective alternatives like NSAIDs are available. [21]

Conclusion

This study showed that there is still some degree of polypharmacy and overuse of antibiotics and prescription errors among the prescription of dental practitioners in Rasht. Putting more emphasis on rational prescribing(& prescription writing in the curriculum plan and continuing education programs for dentistry training can reduce the medication errors.

Acknowledgement

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