Evaluation of the rational drug use by using the World Health Organization core prescribing indicators at the obesity outpatient clinic of a tertiary care hospital

Üçüncü basamak bir hastanenin obezite polikliniğinde Dünya Sağlık Örgütü temel reçete göstergeleri kullanılarak akılcı ilaç kullanımının değerlendirilmesi

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ABSTRACT

Aim: The aim of this study was to evaluate the rational use of drugs prescribed in the obesity outpatient clinic of a tertiary care hospital by using WHO prescribing indicators.

Materials and Methods: The patients that admitted to obesity outpatient clinic between April 1, 2016-August 1, 2017 were reviewed retrospectively. Parameters such as patients' demographic characteristics (age, sex), body mass index, comorbid diseases, number of prescribed drugs, drug names, dosage forms and routes of drug administration were evaluated. Prescriptions were analyzed according to the WHO core prescribing indicators such as average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed and percentage of drugs prescribed from essential drugs.

Results: The mean age of the patients was 47.5±12.4 years and most of them were female (88.1%). Essential hypertension was the most common co-morbid disease (33%). Vitamin D3 (cholecalciferol), (23.7%) was the most frequently prescribed drug. The average number of drugs per encounter was 1.7. The percentage of drugs prescribed by generic name was 0%. Antibiotics were prescribed in 14 (2.8%) patients and injections were prescribed in 26 (5.2%) patients. The percentage of drugs from essential drug list was 61.4%.

Conclusion: We demonstrated that the prescribing indicators such as the average number of drugs per encounter and the percentage of encounters with an antibiotic and injection prescribed were appropriate as compared to WHO standard values, parameters such as the percentage of drugs prescribed by generic name and the percentage of drugs prescribed from essential drug list was quite far from the WHO ideal values. The findings of this study will provide contributions to implement appropriate interventions by health authorities to promote rational drug use.

Keywords: Rational drug use, drug utilization, prescribing indicators.

ÖZ

Amaç: *Bu çalışmanın amacı, üçüncü basamak bir hastanenin obezite polikliniğinde reçete edilen ilaçların akılcı kullanımını DSÖ reçetelenme göstergeleri kullanarak değerlendirmektir.*

Gereç ve Yöntem: *01 Nisan 2016-01 Ağustos 2017 tarihleri arasında obezite polikliniğine başvuran hastalar retrospektif olarak incelendi. Hastaların demografik özellikleri (yaş, cinsiyet), vücut kitle indeksi, yandaş hastalıklar, reçete edilen ilaç sayısı, ilaç isimleri, dozaj formları ve ilaç uygulama yolları gibi parametreler değerlendirildi.*

Reçeteler, kişi başına düşen ortalama ilaç sayısı, jenerik isimle reçete edilen ilaçların yüzdesi, bir antibiyotik reçete edilen kişilerin yüzdesi, bir parenteral ilaç reçete edilen kişilerin yüzdesi ve temel ilaç listesinden reçetelenen ilaç yüzdesi gibi DSÖ temel reçetelenme göstergelerine göre analiz edildi.

Bulgular: *Hastaların ortalama yaşı 47,5±12,4 idi ve çoğu kadındı (%88,1). Esansiyel hipertansiyon en sık görülen yandaş hastalıktı (%33). En sık reçete edilen ilaç Vitamin D3 (kolekalsiferol) (%23,7) idi. Kişi başına düşen ortalama ilaç sayısı 1,7 idi. Jenerik isimle reçete edilen ilaçların yüzdesi %0 idi. On dört (%2,8) hastaya antibiyotik, 26 hastaya (%5,2) parenteral ilaç reçete edildi. Temel ilaç listesinden reçetelenen ilaç yüzdesi %61,4 idi.*

Sonuç: *Kişi başına düşen ortalama ilaç sayısı ve bir antibiyotik ve enjeksiyon reçetelenen hasta yüzdesi gibi reçetelenme göstergelerinin DSÖ standart değerlerine uygun olduğunu, jenerik isimle reçetelenen ilaçların yüzdesi ve temel ilaç listesinden reçete edilen ilaçların yüzdesi gibi parametrelerin ise DSÖ ideal değerlerinden oldukça uzak olduğunu saptadık. Bu çalışmanın bulgularının, sağlık yetkililerinin rasyonel ilaç kullanımını teşvik etmek amacıyla uygun müdahaleleri uygulamasına katkıda bulunacağı düşünülmektedir.*

Anahtar Sözcükler*: Akılcı ilaç kullanımı, ilaç kullanımı, reçetelenme göstergeleri.*

INTRODUCTION

Rational drug use requires a reasonable approach at every stage of the process from production to consumption and disposal of the drugs. The World Health Organization (WHO) meeting held in 1985 is considered as the starting point for rational drug use studies. In this meeting, rational drug use is defined by the WHO as the set of rules that require patients to take the drugs in accordance with their clinical requirements, at doses sufficient to encounter their personal needs, within adequate time and least expenditure to them and the society (1). On the contrary, irrational drug use is the use of drugs in a non-compliant way to the above definition. Common irrational drug use examples include polypharmacy (use of excessive drugs per patient), inconvenient use of antimicrobials, overutilization of injections, nonfulfillment of prescribing based on clinical guidelines and improper self-medication (2). Irrational drug use continues to be an important public health issue worldwide, particularly in emerging countries (3). According to estimates from the WHO; over 50% of drugs are prescribed, dispensed or sold incorrectly and half of patients are not able to use their drugs in a correct way (1). As a consequence, irrational drug use can give rise to drug interactions, development of resistance to certain drugs, recurrence or prolongation of the disease, increase in adverse events incidence and reduced treatment compliance in patients (2, 4-6).

Obesity is a public health problem that has become epidemic worldwide. Obesity is associated with several important comorbidities such as diabetes, hypertension, dyslipidemia and coronary heart disease which frequently require multiple drug use (7, 8). In addition, increasing body mass index (BMI) has been found to be related to polypharmacy in clinical studies (7, 9). Therefore, it is important to evaluate these patients with regard to rational drug use.

The WHO evolved a group of indicators to assess the convenience of drug use such as prescribing indicators, patient care indicators, and facility indicators (10). The WHO prescribing indicators provide useful information in assessing the rational drug use pattern especially in emerging countries (11).

To our knowledge, no study from Turkey to date has reported rational drug use practices based on WHO prescribing indicators. Therefore, the aim of this study was to evaluate the rational use of drugs prescribed in the obesity outpatient clinic of a tertiary care hospital based on WHO prescribing indicators.

MATERIALS AND METHODS

This cross-sectional, retrospective study was conducted at the obesity outpatient clinic of Istanbul Medeniyet University Goztepe Training and Research Hospital. After obtaining approval from the Institutional Ethics Committee, files of the patients that admitted to obesity outpatient clinic between April 1, 2016 - August 1, 2017 were assessed retrospectively. Patients 18 years of age or older and with a BMI ≥ 30 were included in the study. All obesity outpatient clinic prescriptions with at least one or more prescribed drugs were included in the assessment. Parameters such as patients' demographic

features (age, sex), body mass index (BMI), comorbid diseases, number of prescribed drugs, drug names, dosage forms and routes of drug administration were evaluated. Repeated prescriptions of the same patient were not evaluated. Duplications were avoided by noting the first encountered prescription in the registration system for the patient.

The following WHO cores prescribing indicators were utilized in our study and calculated by the notation which is available at WHO's manual regarding drug use indicators (10).

1. Average number of drugs per encounter was estimated by dividing the total number of prescribed drugs by the total number of participants in the study.
2. Percentage of drugs prescribed by generic name was calculated by dividing the count of drugs prescribed by generic name by the total number of drugs prescribed and multiplying by 100.
3. Percentage of encounters with an antibiotic prescribed was calculated by dividing the number of patients who were prescribed an antibiotic by the total number of participants in the study and multiplying by 100.
4. Percentage of encounters with an injection prescribed was calculated by dividing the number of patients who were prescribed an injection by the total number of participants in the study and multiplying by 100.
5. Percentage of drugs prescribed from essential drugs list was calculated by dividing the number of drugs which were present at essential drugs list by the total number of prescribed drugs in the study and multiplying by 100.

The statistical data analyses were carried out by using SPSS v25.0 software. Frequency tables were used to show qualitative data.

RESULTS

A total of 788 data of patients that admitted to obesity outpatient clinic within the given time period (April 1, 2016 - August 1, 2017) were evaluated retrospectively. Among these patients, 503 (63.8%) patients who were written at least one or more drugs were further analyzed. The mean age of the patients was 47.5±12.4 years and most of them were female (88.1%). Most of the patients were 45- 64 years of age group (57.5%), (Table-1). Mean body mass index (BMI) values of the patients were 37.1±5.7 kg/m^2. Essential hypertension was the most common

detected co-morbid disease (33%), followed by diabetes mellitus (30.6%), depression (11.4%) and cardiovascular diseases (8.9%) (Figure-1).

More than half of the patients (59%) were prescribed one drug per encounter and only 2.0% of the prescriptions contained five or more drugs (Table-1). Out of 503 patient data evaluated, a total of 835 drugs were prescribed.

When the names of the drugs were analyzed, vitamin D3 (cholecalciferol) was the most frequently (23.7%) prescribed drug, followed by metformin (19.3%) and levothyroxine sodium (5%) (Figure-2). Oral route (88.1%) was the most common route of administration, followed by the drugs administered subcutaneously (3.8%) and intramuscularly (3.2%). Tablets (50.7%) and oral drops (29.6%) were the most common pharmaceutical forms.

The average number of drugs per encounter was 1.7. There was no drug prescribed by generic name (0%). Antibiotics were prescribed in 14 (2.8%) patients and injections were prescribed in 26 (5.2%) patients. The percentage of drugs from essential drug list was 61.4% (Table-2).
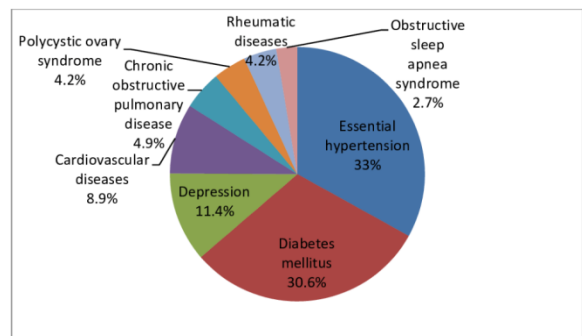

Figure-1. Distribution of the co-morbid diseases of the patients that admitted to obesity outpatient clinic.
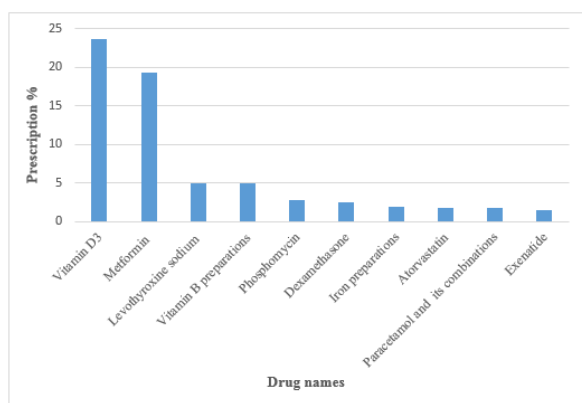

Figure-2. Distribution of the most commonly prescribed ten drugs at obesity outpatient clinic.

Table-1. Descriptive analysis regarding patients and drug use.

Variables	n	%
Drug prescription		
Yes	503	63.8
No	285	36.2
Total	788	100.0
Gender		
Female	443	88.1
Male	60	11.9
Total	503	100.0
Age groups (in years)		
18-44	186	37.0
45-64	289	57.5
≥65	28	5.5
Total	503	100.0
Number of drugs per encounter		
1	297	59.0
2	130	25.8
3	42	8.3
4	24	4.8
≥5	10	2.0
Total	503	100.0

Table-2. Summary of the WHO prescribing indicators of drug use at obesity outpatient clinic.

Prescribing indicators	Prescription analysis	WHO standard values
Average number of drugs per encounter	1.7	1.6-1.8
Percentage of drugs prescribed by generic name	0	100%
Percentage of encounters with an antibiotic prescribed	2.8	≤30%
Percentage of encounters with an injection prescribed	5.1	≤20%
Percentage of drugs prescribed from essential drug list	61.4	100%

DISCUSSION

In this retrospective analysis of patient data from the obesity outpatient clinic of Istanbul Medeniyet University Goztepe Training and Research Hospital, we provided valuable information regarding drug-prescribing patterns relying on the WHO prescribing indicators in Turkey. In the present study, we found a female predominance (88.1%) for a female: male ratio of 7.4:1, which is consistent with the results of other studies reporting the female preponderance for obesity and obesity-related health problems (12). As to the type of co-morbid conditions, in line with the earlier literature essential hypertension, diabetes mellitus, depression and cardiovascular diseases constituted the majority of obesity-related health problems (13).

The average number of drugs per encounter in our study was 1.7, which is within the range of WHO ideal values (1.6–1.8). Similarly, studies from Northwestern Ethiopia and India reported values within the acceptable range of 1.72 and 1.8, respectively (14, 15). Several studies from different countries reported average number of drugs per encounter values higher than our results and WHO standards ranging from 2.2 to 5.85 (4, 5, 16-20).

Polypharmacy, which is an important component of irrational drug use, is described as the use of a

great number of drugs as well as the use of potentially improper drugs which can enhance the risk of adverse drug reactions (21). The most common description of polypharmacy in the literature is prescribing five or more drugs daily (22). In the present study, while the majority of the patients were prescribed one (59%) or two drugs (25.8%), only a small percentage of patients (2%) were prescribed five or more drugs representing low polypharmacy rates.

The most common prescribed drug in the present study was vitamin D3. This result could be related to the finding that high prevalence rates of vitamin D deficiency was found in obese patients (35% higher) as compared to subjects with normal BMI levels (23).

Overuse of antibiotics, which is an indicator of irrational drug use, is of importance in terms of increasing the risk for emergence of the antibiotic resistance (5, 16, 17). In our study, the percentage of encounters with an antibiotic prescribed was 2.8% which was normal as compared to the standard value (≤30%). Low antibiotic use rate could be related to the type of outpatient clinic, namely similar to our results, very low rates of antibiotic use were reported from diabetes outpatient settings in South-Eastern Nigeria (1.7%) and Nepal (0.88%), (24, 25). Conversely, high rates of antibiotic use were reported by a study conducted at ophthalmology outpatient clinic in India (62.2%) (26).

Minimizing the use of injections not only reduces the cost of therapy but also lower the risk of complications related to parenteral use (19). In contrast to the results of other studies from Nepal (71%), Yemen (46%) and West Ethiopia (28.3%), we found low percentages of injection use in the present study (5.1%), (16, 27, 28).

Prescribing the drugs with their generic names both ensure drug therapies to be more rational and decrease the cost of medications (5). In Turkey, all drugs are prescribed with their brand names. Thereby, it was not surprising to determine that no drug was prescribed with generic name in the present study. Similar to our study, a study which was conducted to analyze the drug utilization of glaucoma patients in India, the percentage of drugs prescribed with generic name was 0% (15). In contrast to our finding, several studies have reported high percentages of generic prescribing as follows: 95.7% in Tanzania, 97% in eastern Ethiopia and 98.4% in Northwest Ethiopia (4, 17, 29). Hence, as our generic prescribing finding in the present study is quite far from the expected WHO value, like in most European countries, starting to prescribe drugs with generic names instead of brand ones in Turkey can be an important step towards the rationalization of drug therapy.

According to the WHO Model List of Essential Drugs, the essential drug list of Turkey has been harmonized with relevant lists for essential drugs and can be found at the website of Turkish Medicines and Medical Devices Agency under the title of 'SKRS3 e-prescription drug and other pharmaceutical products list' (https://www.titck.gov.tr/dinamikmodul/43). In the present study, the percentage of drugs prescribed from essential drug list was 61.4% which is lower than the ideal WHO value. In various studies, values lower than those in our study have been reported (25, 26).

CONCLUSION

The present study is the first to report drug utilization patterns according to the WHO prescribing indicators in Turkey. According to the findings of our study, while the prescribing indicators such as the average number of drugs per encounter and the percentage of encounters with an antibiotic and injection prescribed were appropriate as compared to WHO standard values, parameters such as the percentage of drugs prescribed by generic name and the percentage of drugs prescribed from essential drug list was quite far from the WHO ideal values. We hope that the findings of this study will further shed light to the rationalization of drug use as well as providing contributions to perform necessary interventions by health authorities to encourage the rational use of drugs.

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