

Evaluation of drug use in Jordan using WHO prescribing indicators

S. Otoom,¹ A. Batieha,² H. Hadidi,¹ M. Hasan and K. Al-Saudi¹

تقييم استعمال الأدوية في الأردن باستخدام مؤشرات منظمة الصحة العالمية المتعلقة بوصف الأدوية
سمير العتوم، أنور بطيحة، حكم الحديدي، مازن حسن، قاسم آل سعودي

الخلاصة: لم تسبق دراسة أنماط وصف الأدوية من قِبَل الأطباء أو استعمالها من قِبَل المرضى في الأردن، كما أن فهم هذه الأنماط يُتَّسَم بالقصور. ولذلك تم في هذه الدراسة الاستيعابية تقييم الممارسات الحالية لوصف الأدوية في 21 مرفقاً من مرافق الرعاية الصحية الأولية في محافظة إربد في شمال الأردن، باستخدام المؤشرات الأساسية التي توصي بها منظمة الصحة العالمية. وبلغ متوسط عدد الأدوية الموصوفة 2.3 دواء، متراوحاً من 1.9 دواء إلى 3 أدوية. ولوحظ انخفاض شديد في النسبة المئوية للأدوية الموصوفة بأسماء جنيصة (غير مسجلة الملكية)، وكذلك في النسبة المئوية للأدوية الموصوفة المعطاة حقناً. وبلغت النسبة المئوية للمضادات الحيوية الموصوفة 60.9% وللأدوية الموصوفة من قائمة الأدوية الأساسية 93.3%. وخلصت الدراسة إلى ضرورة ترشيح وصف واستعمال الأدوية في الأردن، ولاسيما الإفراط في وصف المضادات الحيوية والاقتصاد في وصف الأدوية الجنيصة (غير المسجلة الملكية).

ABSTRACT Patterns of prescribing and use of pharmaceuticals by physicians and patients in Jordan have not previously been studied. We retrospectively evaluated pharmaceutical drug prescribing practices in 21 primary health care facilities in Irbid governorate, northern Jordan using World Health Organization-recommended core indicators. The mean number of drugs prescribed was 2.3 overall, ranging from 1.9 to 3.0. The percentage of drugs prescribed by generic name was very low, as was the percentage of prescriptions involving injections. The percentages of prescriptions involving antibiotics and drugs from the essential drugs list averaged 60.9% and 93% respectively. We conclude that the prescribing and use of drugs in Jordan requires rationalization, particularly the over-prescribing of antibiotics and the under-prescribing of generic drugs.

Evaluation de l'utilisation des médicaments en Jordanie à l'aide des indicateurs OMS de prescription

RESUME Les schémas de prescription et d'utilisation des produits pharmaceutiques par les médecins et les patients en Jordanie n'ont pas fait l'objet d'études antérieures. Nous avons réalisé une étude rétrospective des pratiques en matière de prescription des médicaments en Jordanie dans 21 centres de soins de santé primaires dans le gouvernorat d'Irbid (Jordanie du Nord) à l'aide des indicateurs fondamentaux recommandés par l'Organisation mondiale de la Santé (OMS). Le nombre moyen de médicaments prescrits était globalement de 2,3 (fourchette : 1,9-3,0). Le pourcentage de médicaments prescrits par nom générique était très faible, tout comme le pourcentage d'ordonnances comportant des injections. Le pourcentage d'ordonnances comportant des antibiotiques et des médicaments figurant sur la liste des médicaments essentiels était en moyenne de 60,9 % et de 93,3 % respectivement. Nous concluons qu'il faut rationaliser la prescription et l'utilisation des médicaments en Jordanie, en particulier la prescription abusive d'antibiotiques et la faible prescription de médicaments génériques.

¹Department of Pharmacology; ²Department of Public Health and Community Medicine, Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan.

Received: 07/08/01; accepted: 27/12/01

Introduction

Despite increased production and consumption of pharmaceuticals in many countries, the availability and rational use of drugs remain a problem for much of the world's population. These problems derive from financial and budgetary constraints, market inefficiencies and distortions, and behaviour of health systems, prescribers, dispensers, consumers and multinational pharmaceutical companies [1]. To optimize the availability and appropriate use of drugs for patients and consumers, a well-designed, comprehensive national drug policy is necessary. Such a policy should cover drug quality, safety, efficacy, availability and affordability, and should encourage rational distribution and consumption [1]. The drug policy should also conform with the ideals of primary health care, including the availability of essential drugs for health care prevention.

Indicators

The World Health Organization (WHO) has developed and validated several indicators to provide an appropriate means to assess a country's drug use patterns and to measure the efficacy of interventions. The indicators are highly standardized and are recommended for inclusion in studies on drug use. They provide a simple tool for quickly and reliably assessing a number of critical aspects of pharmaceutical use in primary health care [2-4].

Drug use indicators are used to measure performance in three areas related to the rational use of drugs in primary health care facilities: prescribing practices, patient care and facility standards. In this respect, five core prescribing indicators have been developed and standardized. These include:

- the average number of drugs prescribed per encounter;

- the percentage drugs prescribed by generic name;
- the percentage of encounters where antibiotics are prescribed;
- the percentage of encounters where injections are prescribed; and
- the percentage of drugs prescribed from the essential drugs list (EDL).

These indicators provide basic information concerning drug prescribing practices. The information obtained can be used to determine implementation priorities in the drugs sector, and to assess the effectiveness of overall drugs policies irrespective of the political, economic or social (including health status) conditions in a country [2-5].

Jordan's National Drug Policy

Jordan has had a National Drug Policy since 1998. The overall objectives of the policy are to:

- ensure that medical needs are covered by the availability at all times of essential drugs, vaccines, medical devices and consumables for the prevention, alleviation and cure of diseases at affordable prices;
- ensure the safety, efficacy and quality of all medicines;
- rationalize the use of drugs by health professionals; and
- support the national pharmaceutical industry, and encourage it to develop activities in line with the EDL.

In general, the National Drug Policy seeks to optimize the availability of drugs and health care services to both the public and private sectors, within the financial and human resource constraints operating in any given period. Constraints that have been, and continue to be, a feature of Jordan's health system include: constantly ris-

ing expenditure on drugs, the fragmented structure of the public supply system, the lack of an adequate drug financing system, inadequate health information collection, irrational use of drugs, and inadequate and obsolete drugs legislation [6].

Because the current situation in Jordan regarding prescribing, dispensing and use of drugs by patients is not well documented, we conducted this study—the first of its kind to be conducted in primary health care centres in Jordan—to provide information about basic indicators of drug use in the context of patient treatment. The data collected will provide baseline information to determine future priorities. The study was conducted in northern Jordan, in the Irbid governorate—an area that was likely to be representative of drug use patterns throughout the country.

Method

Permission to conduct the study was obtained from the Jordanian Minister of Health and from the General Director of Health, Irbid governorate, northern Jordan.

Sampling and data collection

All 96 health centres in Irbid governorate were stratified into 9 sub-districts. A random sample of 2 or more centres was obtained from each sub-district, according to the number of health centres in the sub-district. The total number of selected centres was 21. In each centre, at least 30 prescriptions written over the course of 1999, with an average of 2 to 3 per month, were retrospectively reviewed from patients' files. The data were recorded on forms designed according to the WHO recommendations for investigating core prescribing indicators [2].

Data collectors received training before undertaking the field work, by attending a three-day workshop held at the Faculty of Medicine, Jordan University of Science and Technology and at the University Comprehensive Medical Centre. The workshop was designed to emphasize the following:

- the overall purpose of the study;
- the relationship with health care providers;
- the relationship with patients;
- the main indicators to be collected;
- familiarization with the form design and how to complete it;
- familiarization with the EDL;
- how to determine consulting and dispensing times;
- how to observe correct labelling of prescriptions; and
- the management of problems encountered in the field.

Prior to data collection, a one-day pilot study was carried out at the University Comprehensive Medical Centre. The study design procedures were tested, as was the approach of data collectors to the health care providers and patients. Data collectors were made familiar with the set-up of clinics and pharmacies. A further day was set aside to analyse the data collected from the health centre. Feedback was provided by the collectors and observers on constraints, accessibility of the data, the approach to health care providers, and the negative and positive aspects of the form design.

Calculation of indicators

Throughout the study we followed the methodology recommended by the WHO [2]. Indicators were calculated in the following way:

- Average number of drugs per encounter = total number of drugs prescribed/total number of encounters surveyed.
- Percentage of drugs prescribed by generic name = (number of drugs prescribed by generic name/total number of drug prescribed) \times 100.
- Percentage of encounters with an antibiotic prescribed = (number of patient encounters with an antibiotic prescribed/total number of encounters surveyed) \times 100.
- Percentage of encounters with an injection prescribed = (number of patient encounters with an injection prescribed/total number of encounters surveyed) \times 100.
- Percentage of drugs prescribed from the EDL = (number of drugs prescribed from the EDL/total number of prescribed drugs) \times 100.

Statistical analysis

The data were analysed using *Epi Info*, version 6 software. It should be noted that due to the small number of prescriptions from each centre (30 prescriptions), it was not possible to compare the results between the participating facilities.

Results

We retrospectively studied 685 prescriptions. Table 1 shows the results for each health centre and for all centres combined. The mean age of the patients was 27.1 years (\pm standard error 22.9), ranging across the health centres from a mean age of 6.7 to 43.2 years. Overall the mean number of drugs prescribed per encounter was 2.3 ± 0.9 , with a range across different centres from 1.9–3.0.

The mean percentage of drugs prescribed by generic name was 5.1% overall (range 0%–16.7%); the percentage of prescriptions involving antibiotics 60.9% (range 46.7%–83.3%); the percentage of prescriptions involving injections 1.2% (range 0%–8.3%) and the percentage of EDL drugs prescribed 93% (range 86%–100%).

Discussion

This study is the first attempt to investigate current drug use patterns in Jordan. It was conducted in primary health care facilities in the Irbid governorate, in northern Jordan. The governorate has nine sub-districts that may be considered representative of the country overall, in terms of prevailing social and educational conditions and drug supply patterns. Core prescribing indicators recommended by WHO were used. These indicators are neither dependent on the investigator nor the time of investigation [2].

Our study shows that the average number of drugs prescribed per encounter was 2.3 overall. This value falls nearly at the mid-point of results reported by investigators from the Sudan, Zimbabwe, Nigeria, Lebanon and Republic of Yemen. In these countries, the average number of drugs prescribed per encounter ranged from 1.3 to 3.8 [2,7–10]. This finding reflects the fact that Jordan, in comparison with other developing countries, has reasonable prescribing practices towards polypharmacy.

The overall percentage of drugs prescribed by generic name was low in our study (5.1%) compared with that of India (59%), Nigeria (58%) and Tanzania (82%) [2], but was higher than the value for Lebanon (2.9%) [10]. This reflects the mini-

Table 1 Prescribing indicators in 21 primary health care centres in Irbid governorate, Jordan

Centre no.	Patients' age (years) Mean (s)	No. of drugs per encounter Mean (s)	% of encounters with prescription for:		% of drugs prescribed:	
			Antibiotics	Injections	By generic name	From EDL
1	28.8 (20.6)	2.1 (0.90)	46.7	3.3	6.7	89
2	6.7 (16.4)	3.0 (1.10)	56.7	3.3	16.7	96
3	29.0 (24.3)	2.3 (0.79)	46.7	0	0	91
4	27.2 (23.1)	2.3 (0.97)	51.4	0	5.9	91
5	36.8 (23.3)	2.5 (0.97)	56.7	0	0	92
6	23.0 (23.2)	2.3 (0.85)	63.9	8.3	1.2	88
7	23.7 (22.2)	2.0 (0.81)	56.7	0	3.3	95
8	25.3 (25.1)	2.2 (0.86)	63.9	0	0	99
9	43.2 (24.4)	2.4 (0.91)	47.2	0	8.3	97
10	32.7 (21.8)	2.4 (0.84)	71.0	0	16.1	95
11	30.7 (26.7)	1.9 (0.79)	60.0	0	10.0	97
12	30.6 (21.3)	2.6 (0.97)	66.7	0	10.0	92
13	27.9 (20.0)	2.4 (0.72)	83.3	3.3	3.3	92
14	24.4 (19.1)	2.1 (0.83)	55.6	0	0	95
15	23.0 (20.8)	2.0 (0.77)	70.0	0	10.0	100
16	32.2 (25.5)	2.0 (0.91)	72.2	0	0	96
17	29.4 (23.4)	2.1 (0.80)	46.7	0	6.7	95
18	24.8 (23.4)	2.4 (0.88)	66.7	2.8	8.0	91
19	23.3 (17.7)	2.4 (1.10)	65.7	0	0	95
20	19.8 (19.4)	2.7 (0.99)	76.7	3.3	0	86
21	27.1 (19.9)	2.7 (1.20)	55.6	0	0	88
Total	27.1 (22.9)	2.3 (0.94)	60.9	1.2	5.1	93

EDL = essential drugs list.

s = standard deviation.

mal prescribing of generic drugs by physicians in primary health care facilities. To change this situation requires a political decision to encourage prescribing by generic name, particularly in the public sector. In Jordan, undergraduate medical education in pharmacotherapy is based on the WHO-recommended EDL and adopted by the Ministry of Health, where, in accordance with the EDL, drugs are listed by generic

name. However, medical graduates of Jordanian medical schools account for only a small percentage of the total number of prescribers in the country, most of whom have graduated from elsewhere. Their different educational backgrounds—especially from schools in more affluent regions of the world (such as the United States of America and the European Union countries)—may greatly influence their pre-

scribing practices. In addition, Jordan has a well developed private health care sector and drug supply system which provides strong incentives to medical practitioners to prescribe by brand rather than generically (personal communication, Drug Directorate, Jordan Ministry of Health). We strongly recommend that the Ministry of Health in Jordan issue and implement a resolution regarding the generic prescribing of drugs for both the public and private sectors.

The percentage of encounters where antibiotics were prescribed was 60.9% overall, ranging at different centres from 46.7% to 83.3%. This value is very high compared with that observed in India (43%), Nigeria (48%), Zimbabwe (29%), Lebanon (17.5%) and Yemen (46%), but almost similar to the value from the Sudan (63%) [2,10]. The overuse of antibiotics is still a problem in Jordan, despite the negative effects of indiscriminate prescribing and consumption (Otoom, unpublished data).

Physicians tend to overestimate the severity of illness to justify antibiotic prescribing. They are also under pressure from patients seeking a rapid amelioration of symptoms. Rather than expend the necessary emotional and professional energy on encouraging patients to seek longer-term behavioural change to improve a particular condition, or reducing patient expectations about what is achievable in the short term, it is easier for doctors to prescribe drugs as the primary therapy. Indeed, the patient may be disappointed if the doctor is reluctant to prescribe a drug, regardless of its likely efficacy. Adding to this pressure is the competition between physicians, which exacerbates the circle of public confusion, inappropriate patient drug demand and inappropriate medical practice. The social belief that every disease has its own treatment also complicates the issue

(Batieha A, unpublished data), as does the absence of standard treatment guidelines in Jordan.

In our study, the percentage of encounters where an injection was prescribed was low, at 1.2% overall (range 0%–8.3%). This indicates that the use of injectable forms of drugs in Jordan is quite different from that observed in Nigeria (37%), Republic of Yemen (25%) and India (17%). However, the rate for one health centre (No. 6) was much higher than for the other facilities. This might be explained by physicians in this area having a strong belief in the efficacy of this form of therapy. It has been suggested that the optimal percentage of encounters where an injection is prescribed would be 17.2% [2,7,11]. The cost of injection therapy is almost always higher than oral dosage forms, and patients requiring parenteral therapy, except in emergency situations, should be referred to a hospital.

The percentage of EDL drugs prescribed was 93% overall, with one health facility having a value of 100%. This is high compared with countries such as Tanzania [2,9,12]. Despite the low availability of EDLs in the health facilities studied, this value is impressive and is an indicator of rational drug prescribing and use in Jordan.

The data resulting from this study can be of great value for health authorities seeking to promote more discriminating drug use. Health authorities need to recognize how critical this issue is to the long-term health of the population. Further studies on current treatment regimens for common medical conditions, and the development of standard treatment guidelines for them are necessary, as is the provision of ongoing medical education for health personnel. Health professional and consumer awareness of the problems associated with over-prescribing and overconsumption can be

increased through training workshops, group discussions, health centre promotional activities and media advertising. Lobbying of government authorities to legislate to encourage prescribing of generics and discourage brand prescribing within both the public and private sectors, free distribution of the EDL and formulary, and statutory limits on antibiotic prescribing will also assist.

Acknowledgements

This work was financially supported by WHO. The authors would like to thank his Excellency the Minister of Health, Jordan,

and the Director-General of Health in Irbid, Dr Sulaiman Owais, for their help and support. The authors would also like to acknowledge the Consultative Centre for Science and Technology at the Jordan University of Science and Technology for the help and support provided during this study. Many thanks to Maisa Al-Sakit, the Director of the Drug Directorate, and to Lama Khrais and the rest of National Committee for Rational Drug Use in Jordan for their support. The authors also acknowledge the efforts in data collection of Abeer Abu-Salameh, Rana Obaidat, Daad Bataineh, Rula Batarseh, Mai Khanfar and Sharifeh Al-Shiab.

References

1. WHO Action Programme on Essential Drugs. *Report of the WHO Expert Committee on National Drug Policies*. Geneva, World Health Organization, 1995.
2. WHO Action Programme on Essential Drugs and Vaccines. *How to investigate drug use in health facilities: selected drug use indicators*. Geneva, World Health Organization, 1993.
3. Carrin G. Drugs prescribing: a discussion of its variability and (ir)rationality. *Health policy*, 1987, 7:73-94.
4. Venulet J. Rational prescribing of drugs. *International journal of clinical pharmacology and biopharmacy*, 1977, 15:151-4.
5. Le Grand A, Hogerzeil HV, Haaijer-Ruskamp FM. Intervention research in rational use of drugs: a review. *Health policy and planning*, 1999, 14:89-102.
6. *Jordan National Drug Policy*. Amman, Ministry of Health, 1998.
7. Desta Z et al. Assessment of rational drug use and prescribing in primary health care facilities in north west Ethiopia. *East African medical journal*, 1997, 74:758-63.
8. Tomson G, Diwan V, Angunawela I. Paediatric prescribing in out-patient care. An example from Sri Lanka. *European journal of clinical pharmacology*, 1990, 39:469-73.
9. Krause G et al. Rationality of drug prescriptions in rural health centers in Burkina Faso. *Health policy and planning*, 1999, 14:291-8.
10. Hamadeh GN et al. Common prescriptions in ambulatory care in Lebanon. *Annals of pharmacotherapy*, 2001, 35: 636-40.
11. Hogerzeil HV et al. Impact of an essential drugs programme on availability and rational use of drugs. *Lancet*, 1989, 1:141-2.
12. Kshirsagar MJ et al. Prescribing patterns among medical practitioners in Pune, India. *Bulletin of the World Health Organization*, 1998, 76:271-5.