An-Najah Univ. J. Res. (N. Sc.), Vol. 18(1), 2004

Short Communication ***مراسلة قصيرة***

Antibiotic Drug Cost Variations in Palestine: Physicians and Patients Dilemma

الفوارق بين المضادات الحيوية في فلسطين: معضلة الطبيب والمريض

Waleed Sweileh, Nidal Jaradat, Abeer Mustafa

College of Pharmacy, An-Najah University, Nablus, Palestine.

E-mail: waleedsweileh@najah.edu, nidaljaradat@najah.edu

Received: (15/6/2003), Accepted: (9/12/2004)

Abstract

The objective of this study was to compare and analyze drug price variations among various oral antibiotics marketed in Palestine. Price of various antibiotics were obtained from up-to-date price lists available at the pharmaceutical companies and drug agents. Price range, price ratio and price difference percentage were calculated. A price range as wide as (3 – 26 new Israeli shekels (NIS)) for ciprofloxacin with a price difference percentage of 767% was seen. In all of the cases the price difference was in favor of locally produced companies. This short communication emphasizes the wide variations in antibiotic prices in Palestine and that physicians need to pay more attention for such variations.

ملخص

هدفت هذه الدراسة لمقارنة وتحليل تنوع اسعار المضادات الحيوية في السوق الفلسطيني. تم استخراج اسعار الأدوية من التسعيرات الدوائية الحديثة المعتمدة من الشركات ووكلاء الأدوية. تم حساب فرق السعر ونسبتة لكل دواء. أكثر فرق سعر دوائي كان لدواء سيبروفلوكسيسين حيث كان الفرق هو (٣ – ٢٦) ونسبة الفرق ٧٦٧%. لوحظ أنه في جميع الأحوال كان الفرق لصالح الشركات الدوائية المحلية. هذه المراسلة القصيرة بينت الفروق بين المضادات الحيوية وأنة على الأطباء أخذ هذه الفروق بعين الاعتبار.

Introduction

The pharmaceutical market in Palestine is open and almost unrestricted especially to drug companies and drug agents that belong to the Israeli occupation. At the same time there are few local Palestinian pharmaceutical companies that provide the Palestinian drug market with a wide range of medications. The unregulated Palestinian drug market creates confusion to physicians when selecting and prescribing medications. Ideally, physicians

should, for medical and economical reasons, consider drug prices when prescribing medications [1]. In fact, several studies have indicated that therapeutic compliance is influenced by drug prices [2]. However, studies conducted in 1980s and 1990s have found that most physicians have poor knowledge of medication costs [3-5]. Unfortunately, this lack of knowledge might make it difficult for the physicians to prescribe the most cost-effective treatments [4]. The physicians can overcome this problem by being aware of drug prices and thus prescribing less expensive therapeutic alternatives. In addition, physicians in Palestine need an **updated** and comprehensive drug booklet that contains prescribing data parallel with the drug prices. Such booklet must include all the drug alternatives (local and imported) to enable physicians to select the most appropriate effective therapy considering the economical factors. This short communication was conducted to survey and compare drug price variations of oral antibiotic drugs. The antibiotic drug class was chosen because they are very commonly prescribed for all age categories. Such a survey will educated people in the medical field, both physicians and pharmacist, about the significance variations in drug prices that need to be considered upon selection of drugs.

Methodology

A pilot field study was initially conducted to assess the knowledge of physicians about antibiotic drug prices. Twenty seven physicians were personally interviewed and asked about antibiotic drug prices. Twenty one physicians were unable to predict the prices of Augmentin® and Ogmin® (Am/Clavulanic acid) as well as the prices of Zinnat® and Zinaxim® (Cefuroxime). We noticed that physicians who have private clinics tend to be more knowledgeable with drug prices than physicians who work in governmental clinics and hospitals. This small randomly selected samples reflect the poor knowledge of physicians on drug prices available in the market. This research was conducted to show the variations in the antibiotics drug prices and made some suggestions to decrease possible confusion for the physicians. The prices of oral antibiotics marketed in Palestine were surveyed and analyzed. The up-to-date prices of oral antibiotics were obtained from the price list available at the major drug stores and drug agents in Palestine. The drug prices were more updated at the drug agents and that is why we depended on drug agents rather than ministry of health or pharmaceutical association to obtain the drug prices. Topical and injectable drugs were excluded. Only oral dosage antibiotics were included. The prices were calculated per unit size (i.e.

per tablet, or capsule or one ml suspension. The drug cost variation was presented in the form of range, ratio and percentage difference in price presented in new Israeli shekel (NIS). The price range is presented as lowest and highest price. The ratio is calculated by dividing the highest price on the lowest price while the percentage difference is calculated by dividing the range difference on lowest price and multiplying by 100%.

Results

Antibiotics drug price variations is shown in table one. Table two contains some brand names of the antibiotics listed in table one. The prices of a total of fourty (40) drugs (thirty four single and six combination preparation) were analyzed. These forty drugs are manufactured by local companies or marketed by the Israeli occupation companies or imported from foreign companies. On an average, each formulation is being marketed by 4.3 companies, meaning that for each product there is an average of 4.3 companies both local or foreign that manufacture and market that product in Palestine. The minimum and maximum percentage differences were 6% for amoxycillin 750 mg capsules and 767% for ciprofloxacin 500 mg tablet respectively. It was observed that in all cases the price difference was in favor of the locally manufactured products, as all the prices of local antibiotics are less than imported ones.

Table (1): Various oral antibiotics and their corresponding price range, ratio and percentage. (Am /C = Amoxicillin / Clavulanic acid; tab. = tablet, cap = capsule, susp. Suspension). Unit represent one capsule or one tablet or 5 cc for suspension.

Drug	No. of Manufacturers	Price Range / Unit. New Israeli Shekel (NIS)	Price ratio	Percentage of Price Difference
Penicillin Derivatives				
Amoxicillin 750 mg cap.	2	1.18 – 1.25	1.06	6%
Amoxicillin 500 mg cap.	9	0.75 – 2.05	2.73	173%
Amoxicillin 250 mg cap.	9	0.5 – 1.16	2.32	132%
Amoxicillin 250 mg susp.	8	0.11 – 0.33	3	200%
Amoxicillin 125 mg susp.	8	0.09 – 0.2	2.22	122%
Ampicillin 500 mg cap.	6	0.63 – 1.2	1.90	90%
Ampicillin 250 mg cap.	5	0.4 – 0.5	1.25	25%
Ampicillin 250 mg susp.	5	0.1 – 0.2	2	100%
Ampicillin 125 mg susp.	4	0.08 – 0.1	1.25	25%
Am/C 750 tab.	3	3.2 – 5.57	1.74	74%
Am/C 500 cap	5	1.66 – 3.75	2.26	126%
Am/C 250 cap	4	1.16 – 0.5	1.74	132%

… Continue table (1)

Drug	No. of Manufacturers	Price Range / Unit. New Israeli Shekel (NIS)	Price ratio	Percentage of Price Difference
Am/C 400 susp	3	0.47 – 0.97	2.06	106%
Am/C 250 susp	5	0.32 – 0.45	1.41	41%
Am/C 125 susp	4	0.24 – 0.32	1.33	33%
Cephalosporins				
Cepalexin 500 cap	6	1.8 – 3.55	1.97	97%
Cepalexin 250 cap	5	1.1 – 2.7	2.45	145%
Cepalexin 250 susp	6	0.22 – 0.38	1.73	73%
Cepalexin 125 susp	5	0.15 – 0.27	1.8	80%
Cefuroxime 500 tab	2	7.6 – 14.2	1.87	87%
Cefuroxime 250 tab	2	4 – 7.9	1.98	98%
Flouroquinolones				
Ciprofloxacin 500 tab	5	3 – 26	8.67	767%
Ciprofloxacin 250 tab	5	1.6 – 11.9	7.4	644%
Ciprofloxacin 750 tab	2	3.8 – 32.1	8.4	745%
Ofloxacin 200 tab	5	1.8 – 5.7	3.17	217%
Nalidixic acid 250 susp	2	0.44 – 1.6	3.64	264%
Nalidixic acid 500 tab	2	1.8 – 3.3	1.83	83%
Macrolides				
Azithromycin 250 caplet	3	6.6 – 23.2	3.52	252%
Azithromycin 200 susp	3	1.56 - 5	3.21	221%
Clarithromycin 250 tab	3	1.0 - 3.5	3.5	250%
Clarithromycin 125 susp.	2	0.55 – 1.3	2.36	136%
Clarithromycin 500 tab	2	5 – 10.35	2.07	107%
Erythromycine 250 tab.	6	0.66 – 2.1	3.18	218%
Erythromycine 200 susp	6	0.18 – 0.3	1.67	67%
Erythromycine 400 susp	3	0.28 – 0.61	2.18	118%
Erythromycine 125 susp	3	0.13 – 0.2	1.54	54%
Tetracyclines				
Tetracyclin 250 caps	2	0.37 – 0.65	1.76	76%
Doxyclin 100 tab	8	1.6 – 5.8	3.63	263%
Minocyclin 100 tab	2	4.5 – 7.1	1.58	58%
Minocyclin 50 tab.	3	2.07 – 2.57	1.24	24%

Table (2): Brand names of the various antibiotics listed in table one. For most type of antibiotic, we chose one local and one imported item. The selection is not meant to promote any one of the local Palestinian Pharmaceutical companies.

Drug	Brand name (all are local products)	Brand name (mostly are the imported products)
Penicillin Derivatives		
Amoxicillin 750 mg cap.	Amoxitid 750® caps	Moxypharm 750® caps
Amoxicillin 500 mg cap.	Amoxicare® 500 caps	Moxypen® 500 caps
Amoxicillin 250 mg cap.	Amoxicare® 250 caps	Moxypen® 250 caps
Amoxicillin 250 mg susp.	Amoxicare® 250 susp.	Moxypen® 250 susp.
Amoxicillin 125 mg susp.	Amoxicare® 125 susp.	Moxypen® 125 susp.
Ampicillin 500 mg cap.	Ampipharm® 500 caps	Penibrin® 500 caps.
Ampicillin 250 mg cap.	Ampipharm® 250 caps	Penibrin® 250 caps.
Ampicillin 250 mg susp.	Ampipharm® 250 susp.	Penibrin® 250 susp.
Ampicillin 125 mg susp.	Ampipharm® 125 susp.	Penibrin® 125 susp.
Am/C 750 tab.	Ogmin® 750 tab.	Augmentin® 750 tab.
Am/C 500 cap	Ogmin® 500 tab.	Augmentin® 500 tab.
Am/C 250 cap	Ogmin® 250 tab.	Augmentin® 250 tab.
Am/C 400 susp	Ogmin® 400 susp.	Clamoxin® 400 susp.
Am/C 250 susp	Ogmin® 250 susp	Augmentin® 250 susp.
Am/C 125 susp	Ogmin® 125 susp.	Augmentin® 125 susp.
Cephalosporins		
Cepalexin 500 cap	Jeflex® 500 caps	Keflex® 500 caps
Cepalexin 250 cap	Jeflex® 250 caps	Keflex® 250 caps
Cepalexin 250 susp	Jeflex® 250 susp.	Keflex® 250 susp.
Cepalexin 125 susp	Jeflex® 125 susp.	Keflex® 125 susp.
Cefuroxime 500 tab	Zianxim® 500 tab.	Zinnat® 500 tab
Cefuroxime 250 tab	Zinaxim® 250 tab.	Zinnat® 250 tab.
Flouroquinolones		
Ciprofloxacin 500 tab	Ciprocare® 500 tab.	Ciprogis® 500 tab.
Ciprofloxacin 250 tab	Ciprocare® 250 tab.	Ciprogis® 250 tab.
Ciprofloxacin 750 tab	Ciplox® 750 tab	Ciprofloxacin-Teva®
Ofloxacin 200 tab	Taricin® tab.	Tarivid® tab.
Nalidixic acid 250 susp	U-gram® susp.	Negram® susp
Nalidixic acid 500 tab	U-gram® 500 tab	Negram® tab.
Macrolides		
Azithromycin 250 caplet	Azimex® 250 caplet	Azenil® 250 caplet
Azithromycin 200 susp	Zitrocin® 200 susp	Azenil® 200 susp.
Clarithromycin 250 tab	Klaricare® tablet	Klacid® caplet
Clarithromycin 125 susp.	Klaricare® susp	Klacid® susp.

… Continue table (2)

Drug	Brand name (all are local products)	Brand name (mostly are the imported products)
Clarithromycin 500 tab	Klaricare® 500 tab.	Klacid XL® 500 tab.
Erythromycine 250 tab.	Erythrotab® tab.	ErythroTeva® tab.
Erythromycine 200 susp	Erythrolet® 200 susp.	ErythroTeva® 200 susp.
Erythromycine 400 susp	Erythrocare® 400 susp.	ErythroTeva® 400 susp.
Erythromycine 125 susp	Erythrolet® 125 susp.	ErythroTeva® 125 susp
Tetracyclines		
Tetracyclin 250 caps	Brimocycline® caps.	Tevaccyline® caps
Doxyclin 100 tab	Doxal® caps	Doxylin® tab.
Minocyclin 100 tab	Minoclin® 100 tab	Minocin® 100 tab.
Minocyclin 50 tab.	Minoclin® 50 tab	Minocin® 50 tab.

Discussion

Drug prices of various oral antibiotics was compared. This drug class was very commonly utilized and prescribed. Ideally, competition among pharmaceutical companies should bring drug prices down to a narrow and acceptable range. However, this is not the case in Palestine. This might be due to the structure of the pharmaceutical market in Palestine, political atmosphere and lack of drug pricing regulation committee that can monitor and follow up the marketed drug prices. The comparative study shown here could help Palestinian physicians to make rational economic drug choices. Medical representatives need to provide physicians with such comparative drug prices. In fact studies have shown that providing a manual of drug prices to interns reduced their patient drug expenses [5-6]. This study also should encourage the legislature body in Palestine to make a change in the current pharmacy practice law. Community pharmacist should be given the legal permission to substitute prescribed foreign expensive drugs with their equivalent locally produced medications. No scientific published data claims that any of the imported pharmaceuticals are therapeutically superior to the locally produced ones. We strongly encourage the local pharmaceutical companies to do bioavailability and bioequivalence studies. Therefore, Palestinian physicians MUST prescribe the least expensive brand alternatives to their patients if the therapeutic efficacy is proven to be the similar. This is of great importance given the harsh economical situation in Palestine, the lack of medical insurance coverage to many population sectors in Palestine and the national policy to boycott foreign companies that have ties with the occupation. Finally, the study points out the

importance of having an updated Palestinian Drug Index that could serve the medical community by providing therapeutic information parallel with cost values.

Acknowledgment

The authors would like to acknowledge Miss. Faten Abu Aita for her editorial and technical help,

References

1) Kolassa, M., "Guidance for clinicians in discussing and comparing the price of pharmaceuticals agents", *J Pain Symptom Manage*, **9**, (1994), 235-43.
2) Wlado, D.R., "Outpatient prescription drug spending by the Medicare population", Health Care Finance Rev, (1989), 83-9.
3) Glickman, L., Bruce, E.A., Caro, F.G., Avorn, J., "Physicians' knowledge of drug costs for the elderly", *J. Am Geriatr Soc*, **42**, (1994), 992-996.
4) Hoffman, J., Bareffield, F.A., Ramamurthy, S., "A Survey of physician knowledge of drug costs", *J. Pain Symptom Manage*, **10**, (1995), 432-435.
5) Oppenhheim, G.L., Erickson, S.H., Ashworth, C., "The family physicians knowledge of the cost of prescribed drugs", *J Fam Pract*, **12**, (1981), 1027 - 1030.
6) Frazier, L.M., Brown, J.T., Divine, G.W., Fleming, G.R., Philips, N.M., Siegal, W.C., Khayrallah, M.A., "Can physician education lower the cost of prescription drugs? A prospective, controlled trial", Ann Intern Med., **115(2)**, Jul 15, (1991), 116-21.