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Short Communication **مراسلة قصيرة**

Pharmacological Investigation of Plant-Derived Pharmaceuticals in Palestine

تحليل دوائي للمواد الصيدلانية المشتقة من أصل نباتي في فلسطين

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Abstract

A survey of the plant derived pharmaceuticals in the Palestinian drug market was carried out. The Palestinian Pharmaceutical Index (PPI) which contains a list of the imported and locally produced pharmaceuticals was manually reviewed. The search in the PPI for plant-derived pharmaceuticals shows that laxatives drug class has the highest percentage (60%) followed by bronchial spasm relaxants (56%) and drugs acting on uterus (50%). This survey shows the distribution of plant derived pharmaceuticals among the different pharmacological drug classes. It also shows that plant derived pharmaceuticals still have a reasonable share of the drug market as investigated in Palestine. Medical personnel may need further information on herbal pharmacology.

ملخص

قمنا بعملية مسح دوائي للأدوية ذات المصدر النباتي الموجوده في السوق الدوائي في فلسطين. عملية المسح تمت بمراجعة دليل الأدوية الفلسطيني الذي يحتوي على قائمة باسماء الأدوية المحلية والمستوردة. عملية المسح كشفت أن 60% من عائلة ادوية الملينات و٥٦% من عائلة أدوية موسعات القصبات الهوائية و٥٠% من عائلة أدوية الرحم مشتقة من أصول نباتية. هذا المسح الدوائي يبين توزيع الأدوية المشتقة من أصول نباتية في عائلات الأدوية المختلفة، كما أنه يبين ان هذا الأدوية ما زالت تحتفظ بنصيب معقول من السوق الدوائي. العاملين في الحقل الطبي قد يكونوا بحاجة الى زيادة معلومات في مجال علم الأدوية النباتي.

Introduction

Records on the use of plants as a medicinal source for healing were dated back to the Sumerians, at least five thousand years ago [(1)]. Actually, one of the turning points in the history of human health was the introduction of aspirin, a synthetic analogue of salicylic acid derived from willow bark and used by the residents of the old and new world as a remedy of aches and fevers [(2)].

Important examples of drugs commonly used in old and modern medicine that are derived directly from plant sources include digoxin from *Digitalis spp.*,quinine and quinidine from *Cinchona spp*., vincristrine and vinblastine from *Catharanthus roseus*, atropine from *Atropa belladonna* and morphine and codeine from *Papaver somniferum*. In recent years, the great advances of chemistry and recombinant DNA technology led to introduction of many pharmaceutical synthetic products that dominate the market. Since then, the share of the plant-derived pharmaceuticals has declined significantly and nowadays the interest in plants as a source of new therapeutic agents has oscillated according to the discoveries coming out of research laboratories and the strategies of large pharmaceutical companies.

This short communication is a pharmacological investigation of plant-derived pharmaceuticals marketed in Palestine. The purpose of such survey was an educational effort directed toward the people working in the medical field to have an idea of the share of plant-derived pharmaceuticals in the Palestinian drug market.

Methodology

The *Palestinian Pharmaceutical Index* (PPI), which contains a detailed list of approved marketed imported and local pharmaceuticals, and the MEDIC were manually reviewed section by section. The PPI version we used dated 2000. To the best of the author's knowledge, this PPI version is the only version available. For this reason, we used updated MEDIC website which provides updated information on the imported marketed medicines in Palestine. We also did a survey on the recently introduced pharmaceuticals by the local Arab pharmaceutical manufacturers. For each pharmacological section, the total number of pharmaceuticals and the number of plant derived pharmaceuticals in that section were counted.

Results

Table one shows the different pharmacological classes organized and listed in the same way as the PPI. The frequencies of plant derived pharmaceuticals in the Palestinian market ranges from 0 – 60%. Drug classes which have zero percentage were not shown. For example, antibiotics were not shown in the table since none of the marketed antibiotics is derived from plants. The top three pharmacological classes that have the highest frequency of plant derived pharmaceuticals were, in descending order, laxatives and purgatives (60%), bronchial spasm relaxants (56%) and preparations acting on uterus (50%) as well as food preparations (50%). These drug class categories are very commonly prescribed and dispensed especially the laxatives and purgatives which are used by many elderly people with GIT disorders like constipation. Regarding, bronchial spasm relaxants, methlxanthines, like theophylline is a major drug used for both acute and prophylactic treatment of bronchial asthma. Ergot alkaloids are still in use in migraine and post-partum hemorrhage. Many infant's food preparations, like soy milk, contains herbal products. Of the pharmacological classes in which the percentage of plant derived pharmaceuticals was zero is the anti-infective drug classes. The anti-infective drugs are mostly derived from microorganisms. The overall percentage of the plant derived pharmaceutical in the Palestinian drug market as presented in the PPI was approximately 12%.

The results indicating the pharmacological classes with the percentage of plant-derived pharmaceutical in each class is shown table 1.

Table (1): The pharmacological drug classes as presented in the PPI and the percentage of the plant-derived pharmaceuticals in each class.

		Number of plant derivative pharmaceuticals	**Total number of pharmaceuticals marketed in that category**
1	**Alimentary System**		
	a. Antacids and digestants	11	30
	b. GIT infections and Diarrhea	10	21
	c. Drugs acting locally on colon and rectum	4	22
	d. Gastrointestinal sedatives	14	62
	e. Laxatives, purgatives and lubricants	18	30
2	**Cardiovascular System**		
	a. Cardiac and vascular system reactants	8	119
	b. Migraine	3	13
3	**Central nervous system**		
	a. Analgesics and antipyretics	17	90
	b. Antihistamines and cold preparations	21	61
	c. Sedatives,hypnotics and tranquilizers	4	60
4.	**Musculo-Skeletal System**		
	a. External analgesics	6	19
5.	**Earm Nose and Oropharynx**		
	a. Nasopharyngeal preparations	5	37
	b. Oropharyngeal preparations	11	53

…continue table (1)

		Number of plant derivative pharmaceuticals	Total number of pharmaceuticals marketed in that category
6.	**Genito-Urinary System**		
	a. Antiseptics	2	10
	b. Local reactant on vagina	1	36
	c. Preparations acting on uterus	2	4
8.	**Nutrition and Metabolism**		
	a. Vitamins,mineral and electrolytes	6	90
	b. Anti-neoplastic agents	8	40
	c. Food products	4	8
	d. Miscellaneous drugs affecting nutrition and metabolism	3	37
9.	**Respiratory system**		
	a. Bronchial spasm relaxants	14	25
	b. Expectorants and cough suppressants	23	47
10.	**Ophthalmic preparations**		
	a. Ocular anti-inflammatories	1	54
	b. Glaucoma	2	20
	c. Ocular lubricants	3	15
	d. Mydriatics, anesthetics, stains	2	7
11.	**Dermatological preparations**		
	a. Emollients and antipruritics	3	30
	b. Anti-bacterials, antifungals, antivirals and disinfectants	2	79
	c. Topical steroids with or without antibiotics	1	51
	d. Acne	2	20
	e. Scabicides and pediculicides	2	14
	f. Wart removers	1	4
	g. Miscellaneous dermatological preparations	10	27
12.	**Endocrine system**		
	a. Steroid hormones and related synthetic compounds	2	37
14.	**Contraceptive agents**		
	a. Contraceptive agents	1	16
15.	**Miscellaneous preparations**		
	a. Miscellaneous preparations	5	35

Discussion

This short communication clarifies and points out the significance of herbal pharmacology. Community pharmacists as well as prescribing physicians must be educated on herbal pharmacology related issues. For example, we think that a continuing education lectures on food or drug herbal interaction is important giving the fact that the three pharmacological drug classes that have high percentage of plant derived pharmaceuticals are commonly prescribed. Furthermore, education about herbal toxic and adverse effects is becoming important as well. The colleges of pharmacy in Palestine ought to add a herbal therapeutics and green pharmacy courses to their curriculum. They should also encourage medical and pharmacy students to get enrolled and gained more knowledge on herbal therapeutics, alternative and nutritional therapeutics. In Palestine, where the traditional and herbal medicine is very respectable, the community pharmacist should not hesitate to create special sections in their pharmacies that are fully devoted to herbal and natural products. We strongly believe that community pharmacists can and should play a leader role in herbal therapeutic issues in Palestine. Unfortunately, this is not the case. This is either due to under-estimation of the herbal derived pharmaceutical products or to the over-estimation of the industrialized and modern technology employed by major pharmaceutical companies. Community pharmacists and practicing doctors need to attend seminars and lectures that provide continuing medical education that focus on herbal medicine and its current and future role in medicine. Other researchers have been working hard to promote and investigate the medicinal plants in Palestine. For, example, here at An-Najah university, a research group has been working for years to investigate the role of many medicinal plants in healing skin disorders and prostate cancers [(5)]. Furthermore, a center for *Biodiversity and Environmental Research* has been established in Til / Nablus. Similar herbal research centers have been established in Kofr Kanna and Al-Qudus University. These herbal research centers are publishing books and are actively involved in promoting medicinal plants in Palestine. Our attitudes to herbal pharmaceuticals must positively change.

References

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