Journal of Pharmacy Practice and Community Medicine.2016, 2(3):65-69 • http://dx.doi.org/10.5530/jppcm.2016.3.2 e-ISSN: 2455-3255

RESEARCH ARTICLE

OPEN ACCESS

Prescription Patterns of Antibiotics in Five Dermatologic Outpatient Clinics: A Cross Sectional Study from Yemen

Salwa Omer Bahelah[1] and Gamila Mohammed Abdo[2]

[1]Department of Dermatology and Venereal Diseases, Faculty of Medicine and Health Sciences, Aden, YEMEN.

[2]Department of Pharmacology, Faculty of Pharmacy, University of Aden, Aden, YEMEN.

Received: 01 February 2016;

Accepted: 18 March 2016

***Correspondence to:**

Dr. Salwa Omer Bahelah, MD, PhD,
Department of Dermatology and Venereal Diseases Faculty of Medicine and Health Sciences, University of Aden, Aden, YEMEN.

Email: salwa.bahelah@gmail.com

Abstract

Background: Antibiotics represent one of the most commonly used medicines in dermatology. The objective of the present study is to assess the prescription patterns of antibiotics by dermatologists. **Methods:** A cross-sectional study was conducted in five dermatologic outpatient clinics in Aden Governorate, Yemen. Data were gathered using interviewer-administered questionnaire during the period January to October, 2014. The questionnaire was developed by the authors according to the objectives of the study, it includes patients-related (e.g., age, sex) and drug-related data (e.g., name of the drug, dosage, duration, route of administration and therapeutic efficacy). Data were analyzed by SPSS version 15. **Results:** During the study period, 320 patients were recruited in which 57.2% were females. The majority of female patients (69.4%) were in the age group 11-20 years while most male patients (60%) were in the age group 1-10 years. Most patients (28.4%) were diagnosed with eczema and dermatitis, followed by acne (22.5%). Macrolides (33.2%) were mostly prescribed followed by Penicillin (24.7%). One week duration of prescription of antibiotics for most cases (78.4%). Majority of cases (95.8%) improved clinically with the use of antibiotics that followed established therapeutic guidelines. **Conclusion:** Most cases had eczema and dermatitis, Macrolides were most commonly prescribed and one week duration prescribed for most cases. Most cases improved with guidelines followed.

Key words: Antibiotics, Rational prescriptions, Skin infection, Yemen, Dermatology.

INTRODUCTION

A skin represents the first line of defense against a wide variety of bacterial invaders. When the integrity of a skin is compromised by any factor such as trauma or infection, its natural defense becomes weak and its anti-bacterial effect is compromised. In some situations, in order to compensate for the lost natural barrier of our skins, the use of antibiotics is indicated. Antibiotics are powerful chemical agents that play an important role in protecting, maintaining, and restoring our health, and one of the most commonly prescribed medicines worldwide.[1-3]

Antibiotics are commonly prescribed by dermatologists in clinical practice for a variety of reasons. Since antibiotics form a very important point of contact between the health care provider and patients, there have been calls for their rational use. Rational use of antibiotics means that right antibiotics should be prescribed for the right patient in adequate dose for the sufficient duration.[4] So inappropriate or bad prescribing habits represents a potential hazard to patients such as toxicities, development of microbial resistance and adverse economic impacts due to the high cost. [5,6]

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Prescribing an antibiotic comprises several phases. First phase is perception of need; antibiotics are generally only useful for the treatment of bacterial infections, therefore minor superficial skin infection may more suitably treated with a local antiseptic. The successful outcome of therapy would depend very much on the choice of the proper antibacterial agent, which represents the second phase. The third phase is the choice of a regimen such as what dose and duration are needed and route of administration. There are other choices such as determination of the etiologic agent which depends on a combination of clinical acumen and laboratory support. The monitoring efficacy, adherence to local guidelines and policies is also other phase.[7,8]

There are no studies that examined the rational use and prescription patterns of antibiotics in Aden and this knowledge gap hinders our understanding of the prevailing practices of prescribing antibiotics by dermatologists, where overwhelming number of skin infection cases are being treated. The aim of this study is to describe the prescription patterns and rational use of antibiotics by dermatologists in five main dermatologic clinics in Aden, Yemen. To our knowledge, this study represents the first attempt at filling this knowledge gap and its findings can help develop proper educational tools to limit the irrational use of antibiotics by dermatologists in Aden.

MATERIALS AND METHODS

A cross-sectional study was conducted in five dermatologic outpatient clinics that serve a large number of patients in Aden: the dermatology outpatient clinic at Al-Gamhuria Teaching Hospital and four private clinics. We approached patients attending these clinics and requested their consents. Consequently, those who provided consents were eligible to participate. Data were gathered by the authors using interviewer-administered questionnaires during January to October, 2014. The study questionnaire was developed by the authors according to the objectives of the study to obtain data related to demographics (e.g., age, sex), drug-related (e.g., name of the drug, dosage, duration, route of administration), and the therapeutic efficacy of the drug (e.g., improvement of the clinical status). We presented summary statistics using frequencies and percentages and the data were analyzed using SPSS version 15. The study protocol was approved by the ethical committee at the University of Aden Faculty of Medicine and Health Sciences.

RESULTS

A total of 320 patients were enrolled into the study. Female patients represent the higher number (57.2%) of cases. The majority of male patients (60%) were in the age group 1-10 years, while the majority of female patients (69.4%) were in the age group 11-20 years. Eczema and dermatitis were the most common diagnosed diseases (28.4%), followed by acne (22.5%), while fungal diseases had the lowest prevalence among all diagnosed diseases (0.63%). Table 1 shows the distribution of diagnosed diseases by sex. Acne vulgaris (69.4%) and Eczema/dermatitis (67.0%) were the most common skin diseases among females, while fungal (100%), cellulitis/erysipelas (71.4%) were the most common skin diseases among males.

As Table 2 shows, Macrolides were the most commonly prescribed antibiotics (33.2%) followed by penicillin (24.7%), while quinolones and sulfonamides were the least prescribed antibiotics (0.6%). In eczema and dermatitis,

Table 1: Distribution of skin diseases by sex

Type of diseases	Sex					
	Males		Females		Total	
	No.	%	No.	%	No.	%
Acne vulgaris	22	30.6%	50	69.4%	72	22.5
Eczema and dermatitis	30	33.0%	61	67.0%	91	28.4
Impetigo*	16	53.3%	14	46.7%	30	9.4
Cellulitis and erysipelas*	5	71.4%	2	28.6%	7	2.2
Fungal	2	100%	0	.0%	2	0.63
Viral	3	42.9%	4	57.1%	7	2.2
Insect bite allergy	10	58.8%	7	41.2%	17	5.3
Furuncles and carbuncles*	13	54.2%	11	45.8%	24	7.5
Scabies	23	63.9%	13	36.1%	36	11.3
Miscellaneous**	13	38.2%	21	61.8%	34	10.6
Total	137	42.8%	183	57.2%	320	100

*Skin and soft tissue infections.
**Miscellaneous includes: septic wounds, leg ulcer, in-growing nail, pityriasis rosea, psoriasis and burns.

Table 2: Frequency and percentage of antibiotics prescribed for each type of skin disease

Antibiotic / Disease		Penicillin	Cephalosporin	Macrolides	Aminoglycosides	Quinolones	Tetracycline	Sulfonamides	Topical	Total
Acne vulgaris	No.	4	8	17	0	1	39	1	2	72
	%	5.6%	11.0%	23.6%	.0%	1.4%	54.2%	1.4%	2.8%	100.0%
Eczema/dermatitis	No.	24	22	36	2	0	3	0	4	91
	%	26.4%	24.2%	39.5%	2.2%	.0%	3.3%	0%	4.4%	100.0%
Impetigo	No.	11	5	10	1	0	2	0	1	30
	%	36.7%	16.7%	33.3%	3.3%	.0%	6.7	0%	3.3%	100.0%
Cellulitis/erysipelas	No.	2	3	2	0	0	0	0	0	7
	%	28.6%	42.8%	28.6%	.0%	.0%	.0%	0%	.0%	100.0%
Fungal	No.	0	2	0	0	0	0	0	0	2
	%	.0%	100.0%	.0%	.0%	.0%	.0%	0%	.0%	100.0%
Viral	No.	1	0	6	0	0	0	0	0	7
	%	14.3%	.0%	85.7%	.0%	.0%	.0%	0%	.0%	100.0%
Insect bite allergy	No.	7	3	5	0	0	0	0	2	17
	%	41.2%	17.6%	29.4%	.0%	.0%	.0%	0%	11.8%	100.0%
Furuncles/carbuncles	No.	8	9	4	1	1	1	0	0	24
	%	33.3%	37.5%	16.7%	4.2%	4.2%	4.2%	0%	.0%	100.0%
Scabies	No.	10	7	10	0	0	0	0	9	36
	%	27.8%	19.4%	27.8%	.0%	.0%	.0%	0%	25.0%	100.0%
Miscellaneous	No.	12	3	16	0	0	1	1	1	34
	%	35.4%	8.8%	47.1%	.0%	.0%	.2.9%	2.9%	2.9%	100.0%
Total	No.	79	62	106	4	2	46	2	19	320
	%	24.7%	19.4%	33.2%	1.25%	.6%	14.4%	0.6%	5.9%	100.0%

Table 3: Duration of use of different antibiotics prescribed for skin infections

	Duration of use							
	1 week		1-2 weeks		≥1 month		Total	
Antibiotic	No.	%	No.	%	No.	%	No.	%
Penicillin	75	94.9	4	5.1	0	0	79	24.7
Cephalosporin	59	95.2	3	4.8	0	0	62	19.4
Macrolides	94	88.7	7	6.6	5	4.7	106	33.1
Aminoglycosides	4	100.0	0	.0	0	0	4	1.2
Quinolones	1	50.0	0	.0	0	100.0	1	0.3
Tetracycline	4	8.5	6	12.8	37	78.7	47	14.7
Sulfonamides	0	.0	0	.0	2	100.0	2	0.7
Only Topical	14	73.7	3	15.8	2	10.5	19	5.9
Total	251	78.4	23	7.2	46	14.4	320	100.0

Table 4: Route of administration of antibiotics

Route of administration	No.	%
Oral	81	25.3
Parenteral	9	2.8
Topical	15	4.7
Combination (systemic & local)	215	67.2
Total	320	100

Macrolides were the most prescribed antibiotics (39.5%) followed by penicillin (26.4%). Tetracycline is the most prescribed drug in acne vulgaris (54.2%). Table 3 shows the duration of the use of each antibiotic, with most cases were treated for one week (78.4%). Table 4 presents the distribution of antibiotics according to the route of administration. A combination route (systemic and local) was highly prescribed with a prevalence of 67.2% followed by oral route which was prescribed for 25.3% of cases. Regarding the efficacy of antibiotics, most of the cases (73.4%) improved clinically (data not shown).

DISCUSSION

In the present study, the number of females was 183(57.2%) while males were 137(42.8%), female over representation is similar to two studies done in India.[9-10] The type of infection plays an important role in the management, acne is one of the common conditions for which antibiotics are regularly used. Concomitant use of oral and topical antibiotics in acne should be avoided because it may increase the risk of multidrug-resistant bacterial strains and provides no additive benefit; our result is rationally similar to other studies.[3-11,12] Eczematous skin often harbors staphylococcus aureus, the density of organisms is greater in exudative lesions than in erythematous or lichenified ones, so antibiotics are indicated when infection is clearly present, but proper therapy must include medication that reduce inflammation such as corticosteroids[3-13] In our study, Macrolides mostly prescribed (39.5%), this may be due to the fact that Macrolides have fewer side effects than penicillin, and in public health centers in Yemen this medicine is distributed to patients for free. Beta-lactam drugs (penicillin, cephalosporin) and Macrolides are the most frequently prescribed antimicrobial agents for skin and soft tissue infections; the present study is in agreement with previous reports.[14-16]

Topical antibiotics offer several advantages including reduction of overuse of oral antibiotics, decrease induction of bacterial resistance, avoidance of systemic toxicity and side effects.[3-6] In addition, there is evidence that topical antibiotics are more effective than some systemic antibiotics for the treatment of skin infections such as impetigo and they are the preferred first line treatment.[17,18] In the present study there is limited use of topical antibiotics and this is considered irrational use of antibiotics, but in our situation many patients come with wide spread lesions and poor hygienic conditions. For these reasons, dermatologists have no option other than prescribing oral antibiotics for these cases whether alone or in combination with topical antimicrobials. Combination therapy (systemic+local) route

of administration was commonly prescribed for 67.2% of cases, followed by oral administration (25.3%). This finding was comparable with studies by Khan *et al*[19] and Kayode *et al*[20] that showed oral administration was highly prescribed, while a study carried by Maini *et al*[2] showed that topical antibiotics were most commonly prescribed. Many antibiotics are prescribed for durations of 5-7 days. There are, however, certain diseases where prolonged treatment is necessary.[21,22] In our study, 78.4% of antibiotics were prescribed for durations of one week and this is a good prescribing habit, but in some dermatologic conditions like acne and Madura foot, antibiotics are regularly prescribed for prolonged periods of time (one month and more/14.4%). These findings are similar to a previous report.[12] The standard treatment guidelines and essential drugs are the basic tools for assisting health care professionals to choose the most appropriate medicine for the benefit of patients.

CONCLUSION

The present study is the first to examine the prescription patterns and rational use of antibiotics among dermatologists in Aden, Yemen. It reveals that most of cases were having eczema and dermatitis followed by acne, Macrolides were commonly prescribed followed by penicillin and cephalosporin. Most antibiotics prescribed for one week and the combination route of administration was mostly used. In addition, there is limited use of topical antibiotics and this is considered irrational use of antibiotics.

ACKNOWLEDGEMENT

The authors want to thank the patients who participated in our study.

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Cite this article as: Bahelah SO and Abdo GM. Prescription Patterns of Antibiotics in Five Dermatologic Outpatient Clinics: A Cross Sectional Study from Yemen. J Pharm Pract Community Med. 2016;2(3):65-69.