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Research Article

The Comparison of Skin Infectious Diseases Pattern in 1998 With 2011

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Background: Skin infectious diseases are common worldwide. Epidemiologic studies lead to better understanding of disease profiles and health service organization.

Objectives: This study aimed at comparing skin infections status in 1998 and 2011.

Materials and Methods: Data on all otherwise healthy outpatients with diagnosis of skin infections in 1998 and 2011 were reviewed. Data on demographic characteristics and clinical diagnosis were recorded. According to the microbial origin, all infected dermatoses were classified into four groups: bacterial, fungal, viral and parasitic. At the end of the study, data were analyzed by the SPSS software. Results: Mean age of patients in 1998 and 2011 were 24.52 and 25.75, respectively. Fungal infections comprised 4.4% of total diagnosed skin disorders in 1998 and 3.1% in 2011, viral infections were 3.1% in 1998 and 3.2% in 2011, bacterial infections were 1.2% in 1998 and 1.1% in 2011 and parasitic infections were 3% in 1998 and 0.64 in 2011. Totally cutaneous infectious diseases comprised 11.7% in 1998 and 8.04% in 2011 of all skin diseases in two comparative years. The most common infections were fungal followed by viral infections during both years. Conclusions: In our study fungal and viral infections were the most common infectious diseases. We think epidemiological studies to determine the burden of skin infections are useful for proper health care planning.

Keywords: Skin Disorders; Infections; Epidemiology

1. Background

Skin infections are globally common causes of patient's referral to dermatology clinics. Skin infections in some regions of the world may be as high as 64% of the entire infectious cases (1, 2). There are many factors influencing frequency and pattern of different skin infections including overcrowded populations, low hygiene standards and climatic conditions among others. Implementation of effective public health strategies may lead to desirable changes in the pattern of some skin infections through promotion of health standards, appropriate public training programs or changes in life styles. Study of the frequency and models of infectious diseases in different periods, may assist social authorities and managers to assess already performed projects and attempt new efforts to come up with undesirable skin disease rates in the society.

2. Objectives

This study aimed to compare different skin infection patterns between year 1997 and 2011 in Ahvaz, a city with subtropical climate and relatively high humidity during

most times of the year. To our knowledge no study has been conducted in this region looking at this issue.

3. Materials and Methods

Data on all otherwise healthy outpatients with diagnosis of skin infections who attended a private office located in downtown, during 1998 and 2011 were reviewed. The variables for each patient were age, gender, and diagnosis. We used printed medical charts of patients. Data on demographic characteristics and clinical diagnosis were recorded. Apart from fungal infections which were confirmed by a biological test, other infections were confirmed by biological tests only if clinically there was ambiguity in diagnosis. According to the microbial origin, all infected dermatoses were classified into four groups: bacterial, fungal, viral and parasitic. At the end of the study, data were analyzed by SPSS version 17 (SPSS Inc, Chicago, IL). We studied the frequency and sex and age distribution for each illness and year.

Finally a comparative study on the results between 1998 and 2011 was performed. We used t-test (independent sample t test) for analysis of the difference between the two groups and anova and Tukey for evaluation of

Implication for health policy/practice/research/medical education:

This manuscript is implicated for purposes of research, policy makers and medical education.

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significant difference between more than two groups of data. Chi-square test was used to evaluate significance in

relationship between variables and student test for comparison of means. The level of significance was set at 0.05.

Fable 1. Frequency of Four Groups of Skin Infectious Diseases in Years 1998 and 2011				
Groups of Skin Infectious Disease	Year 1998 (n=198), No.%	Year 2011 (n = 225), No.%		
Fungal infections	37.4	38.7		
Bacterial infections	10.6	13.8		
Viral infections	26.3	39.6		
Parasitic infections	25.8	8.0		

Table 2. Frequency of All Skin Infectious Diseases Recorded in Years 1998 and 2011

Skin Diseases	Year 1998 (n = 198), No.%	Year 2011 (n = 225), No.%
Breast abscess	5	0
Candidiasis	1	0.9
Cellulitis	1.5	0.9
Chicken pox	0	1.8
Eryseploid	0	0.4
Erythrasma	1.5	1.8
Folliculitis	3	5.3
Frunclosis	1.5	1.3
Herpes labialis	5.1	0.9
Herpes vaginalis	2	0.4
Herpes witlow	0	0.4
Impetigo	1	3.6
Ingrowing nail	0.5	0
Leishmaniasis	9.6	1.8
Molluscom	1.5	2.7
Contagiosom	-	-
Onychomycosis	0.5	0.4
Oxioresis	0.5	0
Pediculosis (head lice)	6.1	0.9
Pediculosis corporis	0	0.4
Scabies	9.6	4.4
Scarlet fever	1	0
Sycosis barbae	0	0.4
Tinea capitis	1.5	1.8
Tinea cruris	2.5	1.8
Tinea faceii	0.5	0
Tinea corporis	3.5	4
Tinea versicolor	25.8	30.2
Wart (common)	4.5	6.7
Wart (plain)	1	2.2
Wart (condylomaaccuminata)	0.5	0
Wart (filliform)	1.5	4.4
Wart (genital)	2.5	3.1
Wart (plantar)	4	9.3
Zona	3.5	7.6

Our study was conducted according to ethical principles applicable to medical research in statement of Helsinki declaration.

4. Results

A total of 1700 patients were examined in 1998 of which 198 had skin infectious disease and 2800 patients were visited in 2011 with 225 individual with skin infectious disease. Mean age of patients in 1998 and 2011 were 24.52 ±13.91and 25.75±16.62 respectively. Fungal infections comprised 4.4% of total diagnosed skin disorders in 1998 and 3.1% in 2011, viral infections were 3.1% in 1998 and 3.2% in 2011, bacterial infections were 3.1% in 1998 and 3.2% in 2011, bacterial infections were 3% in 1998 and 0.64 in 2011. Totally cutaneous infectious diseases comprised 11.7% in 1998 and 8.04% in 2011 of all skin diseases in two comparative years. Sex ratio in skin infectious diseases in 1998 was 49% male and 51% females. In 2011 males and females were 44.4% and 55.65%, respectively. The frequencies of four groups of infectious diseases are shown in Table 1.

Table 3. Most Frequent Diseases in Each Group in 1998				
Group of Infectious Diseases	Disease	No. %		
Fungal				
	Tinea versicolor	25.8		
	Tinea corporis	3.5		
	Tinea cruris	2.5		
Viral				
	Herpes labialis	5.1		
	Common wart	4.5		
Bacterial				
	Plantar wart	4		
	Folliculitis	3		
	Erythrasma	1.5		
	Frunclosis	1.5		
Parasitic				
	Scabies	9.6		
	Leishmaniasis	9.6		
	Pediculosis capitis	5.1		

Except for viral infections (P =0.024), gender distribution was not significantly different in 1998 and 2011. Chi-square analysis showed no significant difference between male and female population within 1998 (P =0.42) and 2011 (P =0.19). The frequency of all diseases diagnosed in two study years is demonstrated in Table 2.

By chi-square test, significant difference was found in pattern of disease distribution between the two study years (P =0.00). The three most common infectious diseases in 1998 were : Tinea versicolor, scabies, leishmaniasis and *pediculosis capitis* with rates of 25.85, 9.6% and 6.1%,

respectively. In 2011, Tinea versicolor, plantar wart and common warts (30.2%, 9.3%, and 6.7%) were most frequent infectious disorders. Table 3 and 4 summarize the most frequent diseases in each group for years 1998 and 2011.

Table 4. Most Frequent Diseases in Each Group in 2011				
Group of Infectious Diseases	Disease	No. %		
Fungal				
	Tinea versicolor	30.2		
	Tinea corporis	4		
	Tinea cruris	1.8		
Viral				
	plantar wart	9.3		
	Common wart	6.7		
	Filliform wart	4.4		
Bacterial				
	Folliculitis	5.3		
	Impetigo	3.6		
	Frunclosis	1.3		
Parasitic				
	Scabies	4.4		
	Leishmaniasis	1.8		
	Pediculosis capitis	0.9		

5. Discussion

Information on the epidemiological distribution of infectious diseases in societies assists programming of public health improvement issues. There are different factors which may variably impact the distribution of diseases in a population including climatic condition, hygiene standards, and health care facilities among others. In addition, the increasing rate of organ transplantation or HIV infection in recent decades, which result inimmunocompromisation, has lead to higher rates of infections including skin infections. The more immunocompromised individuals, the higher the rate of susceptibility. Public health strategies can influence some of these factors, such as preventive measures or public educational programs.

In this retrospective survey we compared frequency and demographic characteristics of skin infections during two periods 12 years apart. Although skin infectious disorders are common worldwide, there are a few studies addressing epidemiology of these disorders. In a retrospective study, Goh et al. found viral and bacterial infections as the second most common disease in children in Singapore (3). Sejal et al. conducted a survey of skin conditions in South Asian Americans and found fungal infections and warts as the third most common skin diseases in this group (4). In a report by WHO in 2005, pyoderma, superficial mycoses, viral infections and dermatitis were the most common diseases in children in developing countries (5).

Many authors have emphasized on the high prevalence of skin infections and the irinillnesses and morbidities and (6-8). Nadia et al. found viral infections (15.7% on 1997 and 16.9% on 2007) as the most common skin infectious disease in Tunisia (1). We found Tinea versicolor, as the most common infectious disease in both 1998 and 2011(25.8 % and 30.2%) that is about one fourth of all referred patients. Subtropical climate is an effective factor to explain high rate of Tinea versicolor. The rate of these fungal disorders has not changed significantly. Even though the hot and humid climate can illustrate high rate of Tinea versicolor, however, individual hygiene can possibly reduce the rate of this disease. Milena in Timor reported scabies and fungal infections as the most common skin infections in Timor-Leste (9).

We found fungal and viral infections as the most common skin infections in 1998 and 2011, respectively. In our survey, there was a decrease in the rate of leishmaniasis from 9.6% in 1998 to 1.85% in 2011. We believe that is due to successful preventive interventions such as destroying natural reservoirs through implementing regional environmental health projects. Main differences in rates of diseases were obtained for parasitic and viral infections. In parasitic group of diseases, the major change was due to a decreased rate of cutaneous leishmaniasis. In the viral group, plantar warts rate increased from 4% to 9.9%. Greater availability of public pools and swimming leisure and lack of appropriate personal hygiene may explain this increase. Hence, we are not entirely sure to what extent results can be generalized for the population in all geographic regions, but extension to socio-economic and climatically similar areas is possible.

In conclusion we think epidemiological studies to determine the burden of skin infections are useful for proper health care planning. As many infectious skin diseases can be transferred from one person to another, better understanding of skin disease profiles can contribute to improvement in health care services and use of interventions aimed at education such as public training programs via mass media or using different technological devices nowadays accessible for many people.

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Authors' Contribution

Author 1 developed the idea, performed the data collection and wrote the draft and the second author has mainly done the statistical analysis and discussion.

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