Evaluation of Patients Visiting the Dermatology Emergency Unit of a University Dermatology Hospital in Tehran, Iran

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Abstract- Published studies on dermatological emergencies are limited in the literature. To our knowledge, no study has previously explored this subject in Iran. Our aim was to ascertain the characteristics of patients visiting the dermatologic emergency (DE) unit of a university skin hospital in Tehran, Iran. We studied the files of all the patients seen in the DE unit over a 3-month period, collecting data on age, sex, referral mode, duration of consultation, status (true emergency or non-emergency), and diagnosis. A total of 2539 patients were evaluated; 53% of them were female. Infection and infestation (41.9%), urticaria (16.7%), and dermatitis (13.2%) were the most prevalent entities. Almost 1% of the patients were referred by another physician and psoriasis was their most frequent diagnosis. Almost 2.6% of the patients were hospitalized; psoriasis was once again the most frequent cause. The hospitalization rate was significantly higher in referred patients (P<0.001). A sampling bias may have occurred due to the time interval (three summer months) of the study. The majority of the patients did not require emergency consultation. Even the most prevalent acute conditions such as bite, urticaria, infections, and infestations could be diagnosed and easily managed by general practitioners. The presented data showed a need for improvement in the non-dermatologist physicians' knowledge of emergency dermatologic disorders. This data could also help in tailoring the educational curriculum for medical students more appropriately in order to increase their knowledge of the most prevalent skin disorders.

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Introduction

Skin diseases are mostly managed in an outpatient setting and dermatology is commonly thought of as a non-acute specialty (1,2). A number of skin diseases, however, have a severity that requires either a subacute or an acute evaluation performed by a trained dermatologist (3-5).

The growing interest in this issue is mainly derived from a progressive increase in the demand for assistance in hospital emergency services, up to the point that an annual increase of 10-20% is calculated for emergency assistance (6,7).

Many studies report that a high percentage of visits to the dermatological emergency (DE) unit are unjustified and cannot be considered true dermatological emergencies (8-13). The percentage of non-urgent dermatological conditions out of all the dermatological consultations in the DE unit ranges from 49% as reported by Grillo *et al*., (14) in Spain to an impressive 82% as reported by Jack *et al*., (15) in a US series. Reports on the epidemiology and diagnoses of dermatology emergency conditions are not available in our country. Our university-based dermatology hospital is a tertiary referral center in Iran, which comprises inpatient wards and outpatient clinics. In addition, it has also an outpatient DE unit with dermatology residents and an on-call dermatologist.

It can be challenging to diagnose skin disorders, particularly in the DE unit, when the time allocated to each patient is often limited. On the other hand, the referral pattern of acute dermatologic conditions is not well described in our outpatient setting. Given the financial constraints involved in healthcare today, it is important to understand which type of dermatological presentations are more urgent and constitute 'true emergencies'. We have, therefore, found it of interest to describe the types and prevalence of skin diseases in our

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DE and their prevalence, in greater detail.

Materials and Methods

A total number of 2,539 patients were presented to the Razi Hospital DE unit in Tehran, Iran, between June 22 and September 22, 2013 (the summer months of Iran). We studied the profiles of patients who visited the emergency department. The variables recorded included age, gender, type of referral (patients consulting on their own, or referred by another physician or hospital), the date and time of the consultation, the chief complaint of the patient, and the final diagnosis.

Regular hours (Sunday to Thursday; between 8:00 and 12:00) were covered by one intern and one dermatology resident. The off-duty hours (Sunday to Thursday; between 12:00 and 8:00; Friday and public holidays) were covered by two interns and three residents (two first-year residents and one two- or three-year resident).

The statistical analysis was performed using the version 18.0 of the SPSS software. Frequency was used for qualitative variables and mean±standard deviation was employed for quantitative variables. A comparison among the subgroups was performed using the chi-square test. *P* of less than 0.05 were considered significant.

Results

A total of 2,539 patients were presented to the DE unit during the study period; 1,348 patients (53.09%) were female. The mean age was 31.16±19.75 years (age range: 3 days-92 years).

We classified the various types of diseases into 17 groups. The distribution of the different diagnoses is shown in Table 1.

Table 1. Frequency of the most commonly found groups of dermatoses and the distribution of diseases according to the gender group

Group of dermatoses	Number of cases (%)	Male (%)	Female (%)
Infections and infestations	1064 (41.9)	538 (45.2)	526 (39)
Urticaria and angioedema	423 (16.7)	172 (14.4)	251 (18.6)
Dermatitis	336 (13.2)	150 (12.6)	186 (13.8)
Unknown diagnosis*	145 (5.7)	74 (6.2)	71 (5.3)
Papulosquamous diseases	83 (3.3)	33 (2.8)	48 (3.6)
Other skin diseases**	82 (3.2)	35 (2.9)	47 (3.5)
Drug reaction	81 (3.2)	29 (2.4)	44 (3.3)
Mechanical injuries	73 (2.9)	45 (3.8)	38 (2.8)
Pruritus	70 (2.8)	39 (3.3)	31 (2.3)
Adnexal diseases	45 (1.8)	16 (1.3)	29 (2.2)
Vesiculobullous diseases	40 (1.5)	15 (1.3)	25 (1.9)
Ulcer	28 (1.1)	7 (0.6)	18 (1.3)
Erythema multiforme	25 (1)	17 (1.5)	11 (0.8)
Nail disorders	17 (0.7)	6 (0.5)	11 (0.8)
Non-skin diseases	11 (0.4)	4 (0.3)	7 (0.5)
Hair diseases	8 (0.3)	5 (0.4)	3 (0.2)
Skin tumors	8 (0.3)	6 (0.5)	2 (0.1)
Total	2539	1191	1348

*These patients were not diagnosed at the time of the first emergency visit by the residents and needed consultation in the outpatient clinic or follow-up for diagnosis.

**These miscellaneous skin diseases could not be classified into any of the major groups mentioned in the table. This group included a wide range of diseases such as vitiligo, complications of dermatologic procedures, keloid, and syndromes with cutaneous features.

The group of infectious dermatoses prevailed as the first attending motive, with a total of 1,064 cases (41.9%), followed by urticaria and angioedema, with 423 cases (16.7%), and dermatitis, with 336 cases (13.2%); 145 cases were undiagnosed (5.7%).

Among the 1,064 patients consulted for infectious dermatoses, viral dermatoses were the most frequent subgroup, and shingles were the most prevalent diagnosis (Figure 1). In this group, the next most common diagnosis was insect bites, followed by parasitic diseases including scabies [132 cases (5.2%)], pediculosis [50 cases (2%)], and leishmaniasis [4 cases (0.2%)]. The fourth most common subgroup included bacterial skin infections; these comprised impetigo [78 cases (3.1%)], cellulitis [50 cases (2%)], folliculitis [36 cases (1.4%)], and paronychia [10 cases (0.4%)].

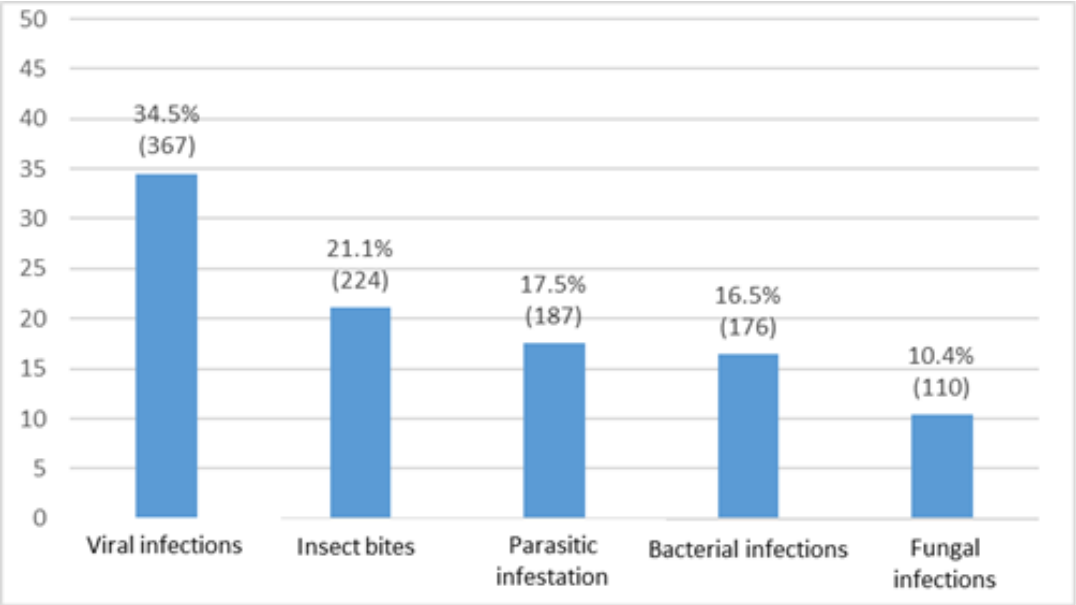

Figure 1. Distribution of infections and infestations among patients visited in the Dermatology Emergency unit

As reflected in Table 1, the top four diagnoses across both sexes were the same, but there were certain important differences. The most common infectious dermatosis was dermatophytosis in males (6.4% in men versus 3.4% in females) and pediculosis in females (3.5% in females versus 0% in men). Both differences were statistically significant (P=0.03 and P=0.012, respectively). In addition, there were also more instances of contact dermatitis and drug reactions within the female group; however, these differences were not significant (P>0.05).

These groups of diseases were also analyzed based on age groups (Table 2). In patients younger than ten years, dermatitis had the highest prevalence, followed by urticaria, impetigo, and insect bite. The largest number of patients (44%) were between 18 and 44 years of age. In this age group, scabies, dermatophytosis, contact dermatitis, shingles, and drug reactions were more common; on the other hand, varicella and impetigo were less prevalent in comparison to the younger groups.

The group of patients over 65 years of age had the lowest frequency, comprising 5% of the total number of patients. In this group, shingles, dermatitis, and scabies were the most common diagnoses. Generalized itching and blistering lesions were other important diseases within this group.

As shown in Figure 2, the highest number of patients were visited between 18:00 and 24:00, and the lowest number of the visits were between 6:00 and 12:00 (the working hours of outpatients' clinics).

Urticaria, dermatitis, scabies, and insect bite were the most common diagnoses between 00:00 and 6:00. A higher prevalence of papulosquamous diseases (10.2%) in morning hours (6:00-12:00) was noteworthy (P<0.01).

Only a small portion of the total number of patients (2.6%) was hospitalized. The highest frequency of hospitalizations belonged to psoriasis (27.3%), urticaria and angioedema (19.7%), vesiculobullous diseases, including pemphigus (10.6%) and bullous pemphigoid (3%) as well as drug reactions (12%). In addition, there was a significant higher hospitalization rate between 6:00 and 12:00 (P<0.001).

Among the 2,539 visits to the DE unit, 35 (1.37%) patients were referred from other physicians, of which 19 (54%) were hospitalized, while only 48 out of 2,504 (1.9%) of the non-referred patients were admitted in the inpatient wards; the difference was statistically significant (P<0.001). The most common diagnoses in referred patients (60%) were papulosquamous diseases, infections/infestations, and urticaria.

Table 2. Distribution of the groups of diseases according to age groups

Group of Diagnosis	≤ 10 years	10–17	18–44	45–64	≥ 65
Infections and infestations	246 (53.1%)	77 (46.7%)	478 (37.1%)	194 (41.8%)	69 (43.9%)
Urticaria and angioedema	49 (10.6%)	25 (15.2%)	259 (20.1%)	82 (17.7%)	8 (5.1%)
Dermatitis	75 (16.2%)	9 (5.5%)	172 (13.3%)	57 (12.3%)	23 (14.6%)
Unknown diagnosis*	34 (7.3%)	10 (6.1%)	65 (5%)	26 (5.6%)	10 (6.4%)
Drug reaction	3 (0.6%)	4(2.4%)	55 (4.3%)	15 (3.2%)	4(2.5%)
Other skin diseases**	9 (1.9%)	8 (4.8%)	41 (3.2%)	13 (2.8%)	11 (7%)
Mechanical injuries	11 (2.4%)	2 (1.2%)	47 (3.6%)	10 (2.1%}	3 (1.9%)
Papulosquamous diseases	2 (0.4%)	8 (4.8%)	54 (4.2%)	15 (3.2%)	4 (2.5%)
Pruritus	5 (1.1%)	2 (1.2%)	36 (2.8%)	19 (4.1%)	8 (5.1%)
Adnexal lesions	3 (0.6%)	6 (3.6%)	32 (2.5%)	3 (0.6%)	1 (0.6%)
Vesiculobullous diseases	5 (1.1%)	3 (1.8%)	7 (0.5%)	16 (3.5%)	9 (5.7%)
Erythema multiforme	4 (0.9%)	4 (2.4%)	15 (1.2%)	2 (0.4%)	0 (0%)
Ulcer	7 (1.5%)	3 (1.8%)	10 (0.8%)	4 (0.9%)	4 (2.5%)
Nail disorders	4 (0.9%)	3 (1.8%)	8 (0.6%)	1 (0.2%)	1 (0.6%)
Non-skin diseases	1 (0.2%)	0 (0%)	7 (0.5%)	2 (0.4%)	1 (0.6%)
Hair diseases	3 (0.6%)	1 (0.6%)	3 (0.2%)	1 (0.2%)	0 (0%)
Skin tumors	2 (0.4%)	0 (0%)	1 (0.1%)	4 (0.9%)	1 (0.6%)
Total	463	165	1290	464	157

*These patients were not diagnosed at the time of the first emergency visit by the residents and needed consultation in the outpatient clinic or follow-up for diagnosis.

**These miscellaneous skin diseases could not be classified into any of the major groups mentioned in the table. This group included a wide range of diseases such as vitiligo, complications of dermatologic procedures, keloid, and syndromes with cutaneous features

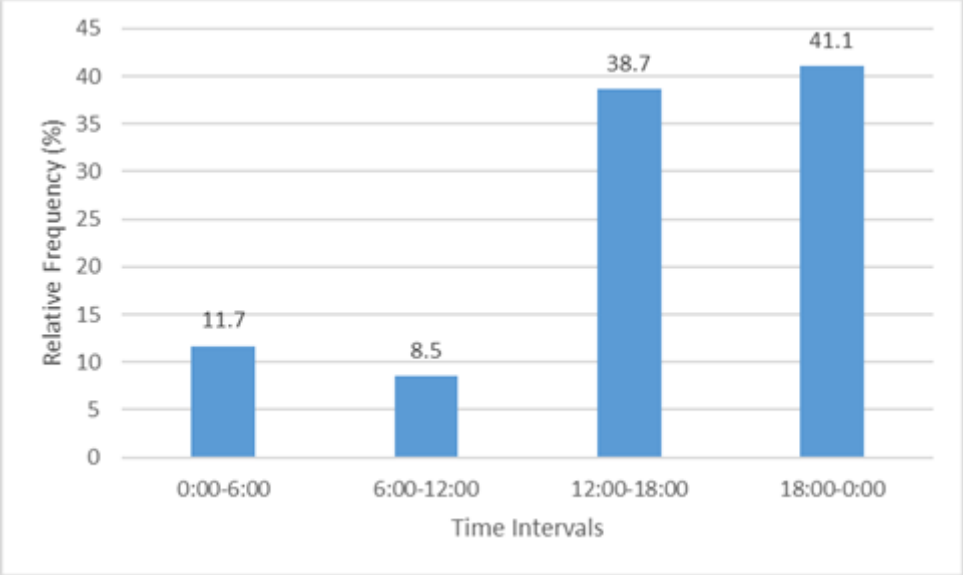

Figure 2. Frequency of the visits according to time intervals

Discussion

In our study, insect bite, urticaria, and dermatitis were the most prevalent reasons behind DE visits. According to a study conducted by Legoupil *et al.*, in France, the most common diagnoses were skin infections, eczema, benign tumors, and psoriasis (5). Rubegni *et al.*, in a study conducted in Italy in 2015, found that the most common diagnostic groups were skin infections, undiagnosed lesions, physical and mechanical damages of the skin, eczema, insect bites, and rash (16). According to two other studies conducted in France, infectious dermatoses remained the most common reason for consultation (17,18).

Insect bite was one of the most common reasons behind DE visits; Rubegni *et al.*, (16) reported a figure of 9.5% in Italy, and according to Symvoulakis *et al.*, bite reactions were seen in 14.9% of visits in the summer months and 4.7% of visits in the winter months in Greece (19). A significant seasonal variation of bites was also

reported in France (18). Similar findings were not reported in other studies. This discrepancy may be due to temporal, seasonal, climatic, and geographical differences between various studies in different countries. Our study has been performed in the summer months with more frequent travels to rural areas and outdoor hobbies. Specific living conditions such as crowded habitats and the use of carpets may also be implicated as potential causes of insect bites. In 1981, Ahmed *et al*., introduced an insect named '*Anthrenus verbasci*,' whose larva had infested a bedroom carpet and caused recurrent urticarial and papulovesicular lesions (20). More importantly, bedbug infestation is also an emerging problem worldwide in industrialized as well as developing countries, especially in crowded, unsanitary habitats (21-23).

In a study by Larsen, unspecified eczema, drug eruptions, psoriasis, and atopic dermatitis were the four most prevalent diagnoses, together accounting for 29% of the diagnoses (24). Mirkamali *et al*., (17) and Isnard *et al*., (18) found that the most frequent dermatoses seen in their DE department were cutaneous infections, especially bacterial infections. In another French study, 70% of all diagnoses consisted of infections, dermatitis, rash, and urticarial lesions (11). In addition, in a study by Wang *et al*., (13) in Singapore, varicella, and shingles, dermatitis and urticaria were the most prevalent diagnoses, but there was also a higher prevalence of nail disorders in their DE. The three most common diseases and the mean age of patients in a study conducted by Shahzad *et al*., (25) in a referral DE center in Saudi Arabia were similar to our study. According to a study conducted in India, skin infections followed by drug reactions were the two most common causes of emergency calls (26). According to a recent study from Spain, infectious diseases and eczema were the two most frequent groups for DE (27). The observed differences among the most common diagnoses in different studies may reflect the different classification systems in existence. However, infectious dermatoses, eczema, and drug eruptions remain the most frequent diagnoses in hospital DE units.

In a study performed within hospital settings, drug eruption was observed as the most frequent cause of dermatologic consultation (28). In our study, except five cases of severe drug reactions leading to hospitalization, which included four cases of the Steven-Johnson syndrome and one case of acute generalized exanthematous pustulosis, drug reactions seen in the DE unit was mostly of the maculopapular type.

Among the night consultations, most of the diagnoses showed evidence of urticaria, dermatitis, scabies, and insect bite. The nocturnal worsening of pruritus among such severely itchy conditions may underlie this finding. According to Grilo *et al*., most of the night consultations were either acute urticaria or herpes zoster (14). We could not explain why papulosquamous diseases were the most frequently diagnosed group of disease in the morning; perhaps these patients could not get an appointment in busy outpatient clinics and had subsequently presented themselves to the emergency department for simple care.

With regard to the pattern of referral, 98% visited a DE unit of their own accord; this percentage is higher than the figure reported by Gil Mateo *et al*., (29), González-Ruiz *et al*., (30), and Grilo *et al*., (14) (86%, 75%, and 57%, respectively). As reported by Ribera (31) and Gupta (26), most these patients sought emergency care for a condition that was not a true clinical emergency. Some authors only consider conditions such as angioedema, erythroderma, severe drug eruptions, pustular psoriasis, and leprosy reactions as true dermatologic emergencies diseases (26,32). However, we retained the definition of a true DE on the basis of the usage employed by Murr *et al*., i.e., as an acute or worsening dermatosis for less than five days (11,18).

Only 1.37% of our patients were referred from other physicians with papulosquamous diseases, infections/infestations, and urticaria as common diagnoses. In studies by Ruzza *et al*., (12), Fernandes *et al*., (33), Davila *et al*., (34), and Martinez *et al.*, (10), eczema and dermatophytoses; skin infections, eczema, and drug reactions; dermatitis and drug reactions; and urticaria and infections were the most common causes of referrals.

More than half of patients in our study were referred for tumors and psoriasis. More than half of our patients, who were referred by other physicians, were hospitalized; in contrast, this rate was only 1.8% for non-referred patients. In total, 2.6% of patients were admitted with psoriasis, urticaria/angioedema, and pemphigus as the most common causes for DE. The total percentage of hospitalization among the referred patients across different studies appears to be the same: 2.2% in the work of Ruzza (12), 4.8% in the work of Martinez (10), 2-10% in the work of Lambert *et al*., (35), and 1.2% in the work of Isnard (18). Since Razi Hospital is the major skin referral centre in Iran, and many patients referred by other physicians need admission for diagnostic or therapeutic interventions, our high admission rate seems logical.

A possible limitation of our study is its time interval (three summer months); this could have created bias in the distribution of specific diseases (greater incidence of conditions typical of summer, such as insect bites).

In conclusion, the majority of patients presenting to the DE did not need emergency consultation. Even the most prevalent acute conditions such as bite, urticaria, infections, and infestations could be diagnosed and easily managed by general practitioners. The presented data predicted the need for improving non-dermatologist physicians' knowledge of emergency dermatologic disorders. This study also places emphasis on the importance of increasing the awareness of non-dermatologist physicians to include common skin diseases as well as life-threatening skin conditions. This study may help the preparation of teaching plans on dermatology, tailored to the requirements of undergraduate students of medicine as well as subsidize the thematic proposals for courses in continued medical education programmes in the field of dermatology. A knowledge of these groups of skin diseases can reduce many unnecessary referrals as well as save time and costs for patients and public medical care systems. As a result, true life-threatening dermatologic conditions may receive better medical services.

References

1. Jemec G, Thorsteindottir H, Wulf HC. The changing referral pattern in Danish dermatology – Rigshospitalet, Copenhagen, 1986–1995. Int J Dermatol 1997;36:453-6.
2. Apaydin R, Bilen N, Dökmeci S, Bayramgürler D, Yildirim G. Drug eruptions:a study including all inpatients and outpatients at a dermatology clinic of a university hospital. J Eur Acad Dermatol Venereol 2000;14:513-22.
3. Martínez-Martínez ML, Pérez-García LJ, Escario-Travesedo E, Rodríguez-Vázquez M, Azaña-Defez JM, Martín de Hijas Santos MC. Referrals to dermatology:proportion of banal disorders. Actas Dermosifiliogr 2011;102:193-8.
4. Chosidow O, Roujeau JC, Revuz J. Emergencies in dermatology. Presse Med 1990;19:453-5.
5. Legoupil D, Davaine AC, Karam A, Peu Duvallon P, Dupré D, Greco M et al. Assessment of dermatological emergencies in a French university hospital. Ann Dermatol Venereol 2005;132:857-9.
6. Del Castillo M, Huguet J, Brabo J, Cortada L. Estudio del área de Urgencias de un hospital general. Grado de adecuación delas visitas. Med Clin (Barc) 1986;87:539-42.
7. Castillo A, Martínez N, Ferrús L, Portella E, Roma J, Triquell L. Características de la utilización del Servicio de Urgencias en un hospital comarcal. Gac Sanit 1986;5:190-3.
8. Usatine RP, Sandy N. Dermatologic emergencies. Am Fam Phys 2010;82:773-80.
9. Pierard-Franchimont C, Devillers C, Paquet P, Quatresooz P, Nikkels AF, Piérard GE. First-line dermatologic emergencies. Rev Med Liege 2008;63:710-4.
10. Martinez-Martinez ML, Escario-Travesedo E, Rodriguez-Vazquez M, Azaña-Defez JM, Martín de Hijas-Santos MC, et al. Dermatology consultations in an emergency department prior to establishment of emergency dermatology cover. Actas Dermosifiliogr 2011;102:39-47.
11. Murr D, Bocquet H, Bachot N, Bagot M, Revuz J, Roujeau JC. Medical activity in an emergency outpatient department dermatology. Ann Dermatol Venereol 2003;130:167-70.
12. Ruzza N, Itin PH, Beltraminelli H. Urgent consultations at the dermatology department of Basel University Hospital, Switzerland:characterisation of patients and setting - a 12-month study with 2,222 patients data and review of the literature. Dermatology 2014;228:177-82.
13. Wang E, Lim B, Than K. Dermatological conditions presenting at an emergency department in Singapore. Singapore Med J 2009;50:881-4.
14. Grillo S, Vano-Galvan N, Jiménez-Gómez A, Ballester A, Muñoz-Zato E, Jaén P. Dermatologic Emergencies:Descriptive Analysis of 861 Patients in a Tertiary Care Teaching Hospital. Actas Dermosifiliogr 2013;104:316-24.
15. Jack AR, Spence AA, Nichols BJ, Chong S, Williams DT, Swadron SP, et al. Cutaneous Conditions Leading to Dermatology Consultations in the Emergency Department. West J Emerg Med 2011;12:551-5.
16. Rubegni P, Cevenini G, Lamberti A, Bruni F, Tiezzi R, Verzuri A, et al. Dermatological conditions presenting at the Emergency department in Siena University Hospital from 2006 to 2011. J Eur Acad Dermatol Venereol 2015;29:164-8.
17. Mirkamali A, Ingen-Housz-Oro S, Valeyrie-Allanore L, Bouvresse S, Duong TA, Chosidow O, et al. Dermatological emergencies:a comparative study of activity in 2000 and 2010. J Eur Acad Dermatol Venereol 2013;27:916-8.
18. Isnard C, Ingen-Housz-Oro S, Fardet L, Matteodo E, Duval S, Hemery F, et al. Dermatological emergencies:evolutionfrom 2008 to 2014 and perspectives. J Eur Acad Dermatol Venereol 2017;31:274-9.
19. Symvoulakis EK, Krasagakis K, Komninos ID, Kastrinakis I, Lyronis I, Philalithis A, Tosca AD. Primary care and pattern of skin diseases in a Mediterranean island. BMC Fam Pract 2006;7:6 .
20. Ahmed AR, Moy R, Barr AR, Price Z. Carpet beetle dermatitis. J Am Acad Dermatol 1981;5:428-32.
21. Hwang SW, Sovoboda TJ, De Jong IJ, Kabasele KJ, Gogosis E. Bedbug infestations in an urban environment.

Emerg Infect Dis 2005;11:533-8.

22. Vail KM, Chandler JG. Bed Bug (Hemiptera:Cimicidae) Detection in Low-Income, High-Rise Apartments Using Four or Fewer Passive Monitors. J Econ Entomol 2017;110:1187-94 .
23. Sentana-Lledo D, Barbu CM, Ngo MN, Wu Y, Sethuraman K, Levy MZ. Seasons, Searches, and Intentions:What The Internet Can Tell Us About The Bed Bug (Hemiptera:Cimicidae) Epidemic. J Med Entomol 2016;53:116-21 .
24. Larsen HK, Sand C. Referral Pattern of Skin Diseases in an Acute Outpatient Dermatological Clinic in Copenhagen. Acta Derm Venereol 2005;85:509-11 .
25. Shahzad M, Alzolibani AA, AlRobaee AA, Alsharkasy MH, Al Marshood AA, Al Mutiari A, et al. Patients seen at the Dermatology ambulatory office in a tertiary care center in Qassim region, Saudi Arabia. Int J Health Sci (Qassim) 2013;7:130-5.
26. Gupta S, Sandhu K, Kumar B. Evaluation of emergency dermatological consultations in a tertiary care centre in North India. J Eur Acad Dermatol Venereol 2003;17:303-05.
27. Bancalari-Díaz D, Gimeno-Mateos LI, Cañueto J, Andrés-Ramos I, Fernández-López E, Román-Curto C. Dermatologic emergencies in a tertiary hospital:A descriptive study. Actas Dermosifiliogr 2016;107:666-73.
28. Falanga V, Schachner LA, Rae V, Ceballos PI, Gonzalez A, Liang G, et al. Dermatologic consultations in the hospital setting. Arch Dermatol 1994;130:1022-5.