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Seasonal Erythema AB Igne in Iraqi Population (Clinico-Histopathological Study)

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Abstract
Background*: Erythemaabigne is a characteristic localized reticular erythematous and pigmented dermatosis resulting from repeated or prolonged exposure to infrared radiation insufficient to produce a burn.*
Objective: *To do fullclinical and histopathological evaluation of erythemaabigne in Iraqi population.*
Patients and Methods*: This case series, descriptive and histopathological study was done in the Department of Dermatology-Baghdad Teaching Hospital in Baghdad,Iraq during the period from October 2013-July 2014. History and dermatological examination were carried out for all patients regarding all relevant points related to the disease. Punch biopsy was performed for ten patients from the most representative skin lesion and stained by H&E and Fontana-Masson stains for histopathological assessment.*
Results*: A total of 42 patients with erythemaabigne were identified and included in this study. They were seen only during winter season. They were 37(88.1%) females and 5(11.9%) males, with female to male ratio 7.4:1. Their ages ranged from 6-70(27.76±15.89)years. Legs were the most commonly involved site. All patients presented with regional localized reticular erythematous and hyperpigmented pattern that might simulate poikeloderma. Only one patient with bullouserythemaabigne was identified. Kerosene and electric heaters were the main heat source in all patients. The condition was asymptomatic in most of thepatients. Associated medical problems were observed in 19% of patients which include: hypertension, diabetes mellitus, rheumatoid arthritis, fracture of humerus, vitiligo, gastritis and hepatitis. The main histopathological findings were:dilation and congestion of post-capillary venules(100%) associated with variable perivascular lymphocytic infiltrates(90%) in superficial papillary dermis, hyperkeratosis (30%), acanthosis (70%), vacuolization of basal cell layer (100%), epidermal atrophy (20%), necrotic keratinocytes (90%) and rete ridges effacement (40%). Fontana-Masson stained sections revealed basal layer hyperpigmentation (30%) and increased dermal melanophages (40%). No malignant or premalignant histopathological changes were observed. Two cases with intraepidermalacantholysis and blister formation resembling pemphigus and one patient with bullouspemphigoid like subepidermalseparation were identified.*
Conclusions: *Erythemaabigne is seasonal in Iraq, predominantly seen during winter months among young females. It is a self- limiting condition, usually fades spontaneously. It has characteristic clinical and histopathological features which make its diagnosis easy.*
Keywords: *Erythemaabigne, poikeloderma,pemphigus like, infrared radiation.*

I. Introduction

Infrared radiation (IR) is the segment of the electromagnetic spectrum that extends between red visible light and microwaves and radio waves. It's wavelengths range from 0.75 μm (750 nm) to 100 μm(1mm)[(1)]. Human skin has considerable exposure to both natural and artificial infrared radiation every day in the form of heat[(2)].
Unfortunately, the physical and biochemical effects of infrared radiation on skin have received little attention in medical literature. Infrared radiation effects on the skin can be classified into either acute or chronic effects according to the exposure duration[(3)] .

Acute effect varies clinically from mild erythema to severe burn depending on intensity of heat[(3)].While chronic exposure to IR heat causes a clinical condition so called erythemaabigne[(4)]Erythemaabigne is a characteristic localized reticular erythematous and pigmented dermatosis, resulting from repeated or prolonged exposure to infrared radiation, insufficient to produce a burn. Classically, it is found to occur on the shins of elderly patients who spend time in close proximity to heating sources, and its incidence has been greatly reduced with the advent of centralized heating[(4)] . Recently, however, It has been reported following the use of various heat sources, including

hot pads and electric blankets, laptops, open fires, hot stoves, chulha, space heaters, infrared lamps, steam radiators, car heaters, wood-burning stoves, furniture with inbuilt heating unit, heating blankets, frequent bathing in hot water, and sauna belts[5-11] .

Clinically, erythemaabigne begins with an evanescent reticular erythema that, with repeated heat exposure, causes a more marked redness with noticeable hyperpigmentation and superficial epidermal atrophy. Continued exposure can lead to poikioderma with erythema, pigmentary changes, atrophy, telangiectasia and hyperkeratosis.[4]Subepidermalbullae formation has also been rarely reported[12] .

In Iraq, erythemaabigne is a common winter rash, frequently encountered during cold winter time, as there is bouts of cold exposure make people stick to heaters.

But unfortunately, no studies regarding this condition were recorded in medical literature. Hence, the aim of the present study is to do full clinical and histopathological evaluation of erythemaabigne in Iraqi population.

II. Patients And Methods

This case series, descriptive, clinical and histopathological study was carried out in the Department of Dermatology and Venereology-Baghdad Teaching Hospital, Baghdad, Iraq during the period from October2013 to July2014. Formal consent was taken from each patient or their parents before starting the study, after full explanation to the patient about the goal of the study, nature of the disease, course, treatment options and prognosis. Also, the ethical approval was given by the scientific committee of the Scientific Council of Dermatology and Venereology-Arab Board for Medical Specializations.The diagnosis was established on history and clinical basis. History was taken from each patient regarding: age, gender, address, occupation, site, number and duration of lesions, associated symptoms, history of heat exposure and the type of heat source, history of similar eruption in the past, family history and past medical and surgical history. Thorough clinical examination was carried out including the following points: site, number and clinical appearance of the lesions. Skin biopsy was performed for ten patients from the most representative skin lesion using 4mm punch blade, and the specimens were fixed in a buffered 10% formalin solution and stained by Hematoxylin and Eosin (H&E) stain and Fontana-Masson stain(melanin stain) for histopathological study.All patients were photographed by a digital camera (Sony: Cyber shoot with resolution 12 mega pixels) in the same place with fixed illumination and distance.

Statistical Analysis

SPSS v.22 (statistical package for social sciences version 22) is used for data input and analysis. Continuous variables presented as mean ±SD (standard deviation) and discrete variables presented as numbers and percentages.

III. Results

Clinical Results

A total of 42 patients with erythemaabigne were included in this study, they were 37 (88.1%) females and 5 (11.9%) males, with female to male ratio 7.4: 1.Their ages ranged from 6-70 years with a mean± SDof 27.76 ±15.894 years and the most common age group in this work was 11-30 years (Table-1).All patients were seen during the period from January to April, 2(4.76%) patients were seen in January, 33(78.57%) in February, 6(14.29%) in March and 1(2.38%) in April (Figure-1).

The total number of lesions was 86, their distribution vary according to the site exposed to the heat source , legs were the most common involved site 44 out of 86 (51.16%) followed by the forearm 16 (18.6%), thigh 14 (16.27%), dorsum of foot 6 (6.97), arm 4 (4.65%), dorsum of hand 1(1.16%) and sole of foot 1(1.16%). (Table -2).

All patients have presented with classical reticular erythematous and or hyperpigmented pattern that might resemble poikeloderma. Telangiectasia was not observed. Only one(2.38%) patient presented with bullae and crusts within a localized area of reticular, brown, macular pigmentation on the shins of both legs (Figures-2- 6).Lesions were bilateral in 28(66.66%) patients and unilateral in 14 (33.33%) patients.The duration of lesions ranged from 1-20 weeks with a mean ±SD of 5.69 ±3.996 weeks. The main heat source in all patients was an electric or kerosene heater.Most of the patients were unaware of any symptoms. Burning and itching were recorded from 5 (11.9%) patients.Past history of similar eruption was reported from 7(16.66%) patients, with spontaneous resolution in summer leaving no residual lesion. Similar eruption in other family member was noted in 2(4.7%) patients.

Associated medical problems were reported from 8(19%) patients, which include: hypertension in 2(4.76%)patients, diabetes mellitus in 1(2.38%), rheumatoid arthritis in1(2.38%), fracture of humerus in 1(2.38%), vitilgo in 1(2.38%), chronic gastritis in 1(2.38%) and chronic active hepatitis in 1(2.38%).

Histopathological Results

Light microscopic examination ofHematoxylin and Eosin (H&E) stained sections revealed the following changes: hyperkeratosis in 3(30%) of 10 patients, acanthosis in 7(70%), hyperpigmentation of basal cell layer in 3 (30%) , epidermal atrophy in 2 (20%) , rete ridges effacement in 4(40%) , pigment incontinence in the form of dermal melanophages in 4(40%) , basal layer vacuolization in 10(100%), necrotic keratinocytes in 9(90%) , dilation and congestion of post capillary venules in 10 (100%) which were focally aggregated throughout the papillary dermis. Variable perivascular inflammatory lymphocytic infiltrates in 9(90%) mostly around superficial dermal vascular plexus, where sparse infiltrates were seen in 4 (40%) patients, mild infiltrates in 3(30%) patients and moderate infiltrates in 2 (20%) patients.

Fontana-Masson stained sections revealed increased epidermal melanosis mainly the basal layer in 3 (30%) out of 10 patients, while moderately increased in dermal melanophages were observed in 4(40%) of patients (Table-3).Striking findings were noted in 3(30%) patients, in one of them we have observed subepidermal separation with bulla formation, in a picture similar to bullouspemphigoid (Figure-7),while acantholytickeratinocytes with intraepidermal blisters, histologically simulates cases of pemphigus, were observed in 2 patients (Figures-8,9). It is noteworthy to mention that none of the three patients has any blister clinically.

No premalignant or malignant histopathological changes were observed in any patient.

Table-1: Age Group Distribution.

Age group	*Frequency*	*%*
1 -10 years	3	7.1
11-20 years	14	33.3
21-30 years	13	31.0
31-40 years	4	9.5
41-50 years	4	9.5
51-60 years	1	2.4
61-70 years	3	7.1
Total	42	100.0

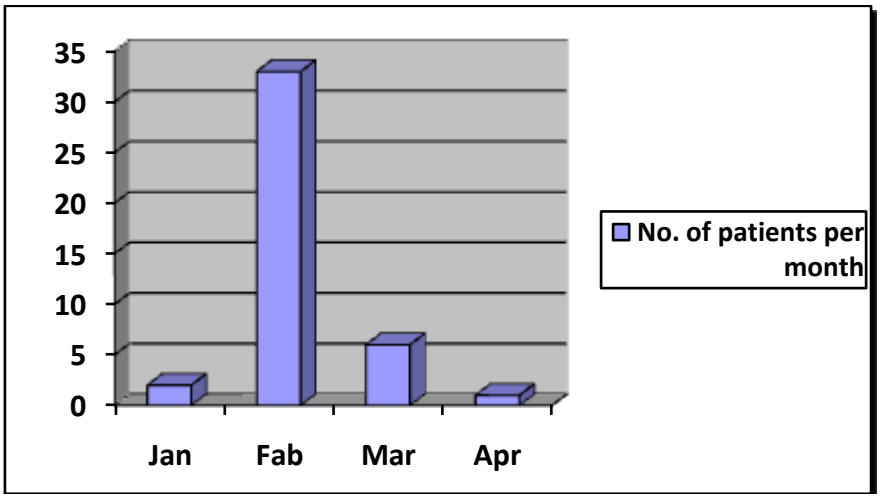

Figure-1: Frequencies of patients per month.

Table-2: Site distribution of erythemaabigne.

Site	*No. of lesions*	*%*
Arm	4	4.65%
Forearm	16	18.60%
Dorsum of hand	1	1.16%
Thigh	14	16.27
Leg	44	51.16%
Sole	1	1.16%
Dorsum of foot	6	6.97%
Total no. of lesions	86	100%

Table-3: Histopathological features of erythemaabigne.

Feature	**No. of patients**	**%**
Hyperkeratosis	3	3 0 %
Acanthosis	7	7 0 %
Epidermal atrophy	2	2 0 %
Rete ridges effacement	4	4 0 %
Basal layer vacuolization	1 0	1 0 0 %
Necrotic keratinocytes	9	9 0 %
Dilation & congestion of post capillary venules	1 0	1 0 0 %
Variable perivascular infilterates	9	9 0 %
Bullous lesion	3	3 0 %
By Fontana basal layer hyperpigmentation	3	30%
By Fontana dermal melanophages	4	40%

Figure-2: Erythema ab igne affects the left sole of 20 years old female.

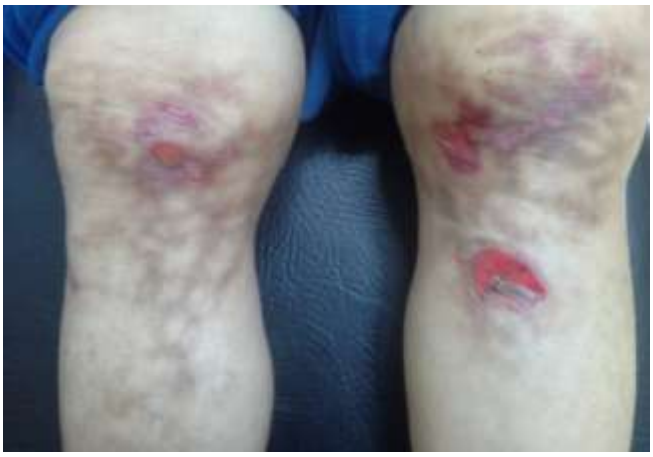

Figure-3: Bullae and crusts within a localized area of reticular brown macular pigmentation on antero-medial aspects of legs and knees in 66 years old lone living male.

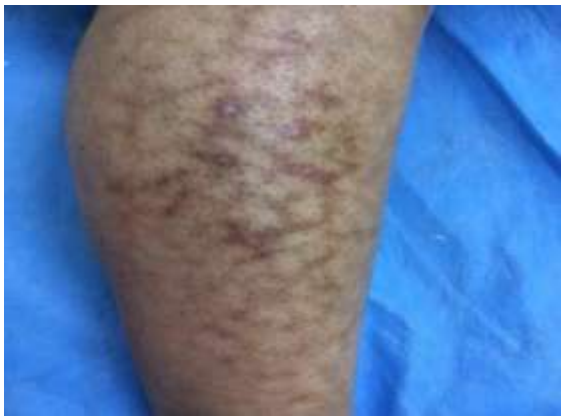

Figure-4;Erythemaabigne affects the antero-lateral aspect of right leg in 30 years old female.

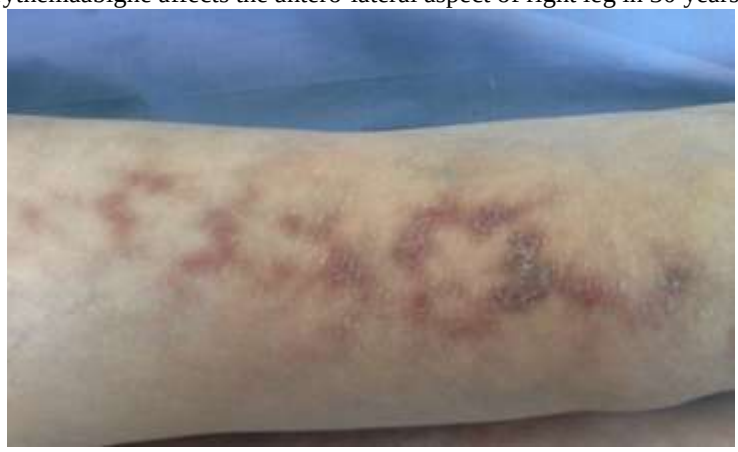

Figure-5: Erythemaabigne affects the left thigh in 63 years old male.

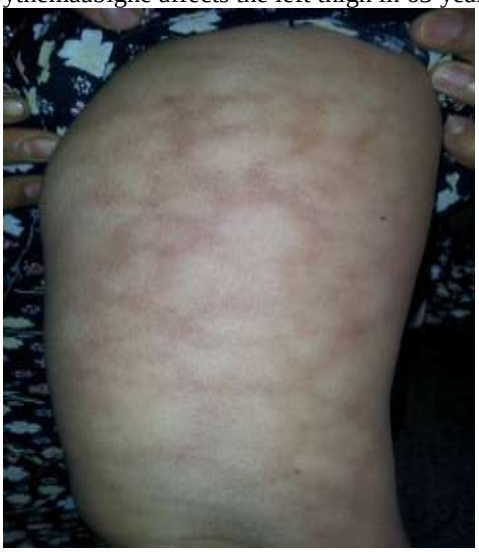

Figure-6: Erythemaabigne affects the right arm in 30 years old female with history of fracture in the right humerus.

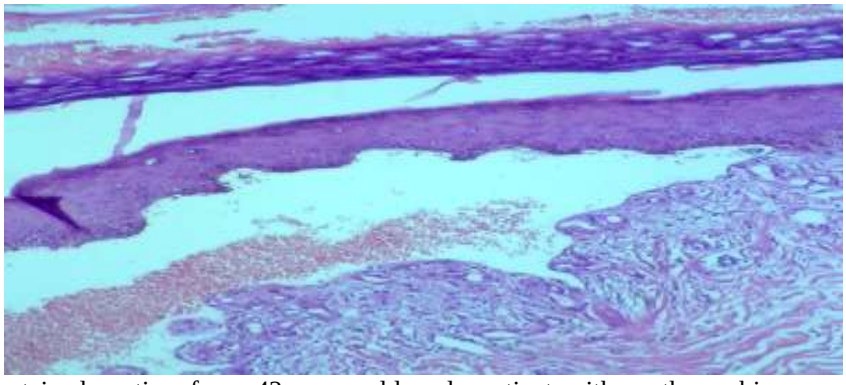

Figure-7(A):H&E stained section from 42 years old male patient with erythemaabigne on his legs showing subepidermal separation with bulla formation (bullouspemphigoid like). It also shows basal layer hyperpigmentation and dilation of post capillary venules with sparse lymphocytic infiltrates in superficial papillary dermis (× 40).

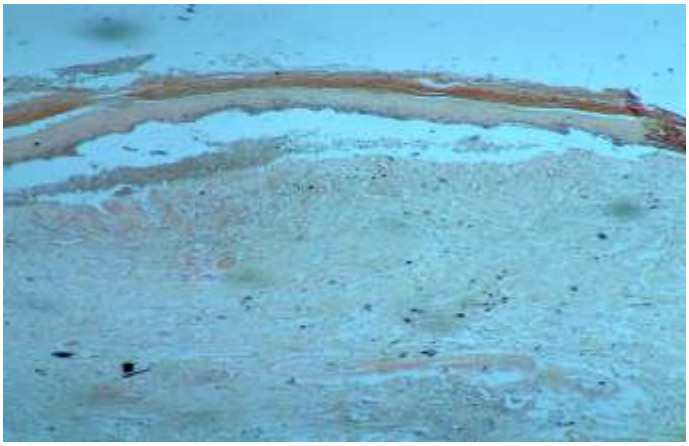

Figure-7(B): Fontana-Masson stained section of the same patient above showing basal layer hyperpigmentation and increase dermal melanophages (×40).

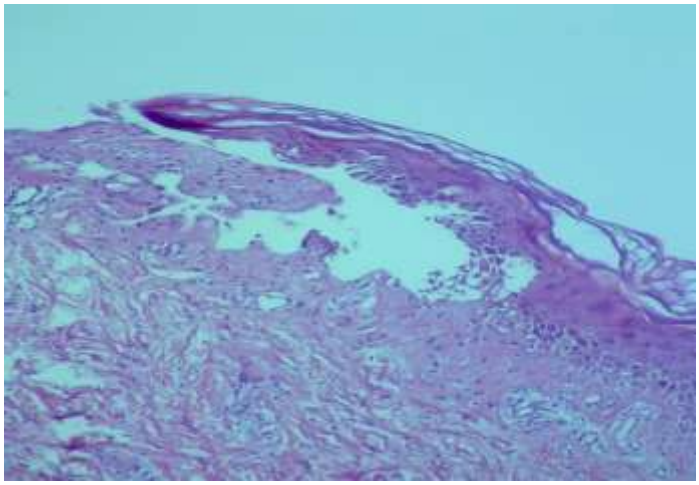

Figure-8:H&E stained section from 6 years old female patient with erythemaabigne affects her legs showingsuprabasalacantholysis with bulla formation (pemphigusvulgaris like)(×40).

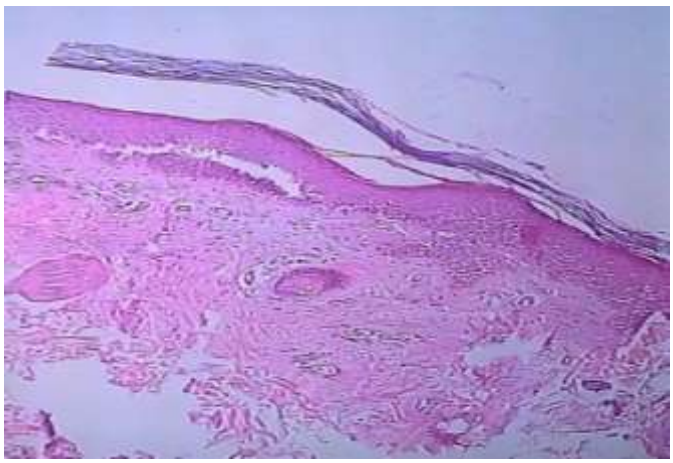

Figure-9:H&E stained section from 39 years old female patient with erythemaabigne affects her left thigh showingsuprabasalacantholysis with bulla formation (pemphigusvulgaris like)(×40).

IV. Discussion

To the best of our knowledge, this is the first study of erythemaabigne in Iraq and abroad showing full clinical and histopathological evaluation of this condition.

Erythemaabigne is a common winter rash in Iraq. During 1960s and 1970s ,erythemaabigne was usually began to be seen around October, but in the last few decades as a result of global enviromental changes , erythemaabigne has began to seen around December and January, as confirmed by this study, corresponding with the onset of the cold season. The present work showed that this condition is predominantly seen among females (female to male ratio was 7.4:1). Rarity of this condition among males may be simply related to the fact that males usually spend most of their time outdoor while females usually stay indoors.The mean age of patients in the present study was 27.7±15years which is considered younger than that reported by Raza*et al*, [(13)] where mean age was 36.5±14 years.

The causative heat source was electric or kerosene heater in all patients. Leg was the most commonly involved site (51.16%), followed by forearm (18.60%) and thigh (16.27%) which is in consonance with Raza*et al* study.[(13)]In the present work, all patients have presented with the characteristic rash of erythemaabigne which was localized reticular erythematous and /or hyperpigmented eruption simulating poikeloderma which was similar to poikeloderma commonly seen on the inner aspects of forearms of housewife as a result of repeated IR exposure following making bread using so called tunor or tandoras a heat source. Bullouserythemaabigne , a well-defined variant of erythemaabigne but rarely reported in the literature, was seen in one patient, where bullae and crusts were seen on the top of characteristic erythemaabigne rash. This could be due to intense acute exposure to infrared radiation.

An unusual case of erythemaabigne occurred on the sole was observed in onepatient. The diagnosis was not easy to be established unless a history of direct heat exposure was obtained from the patient.

The condition was asymptomatic in most of the patients, only11.9% of patients report symptoms of burning or itching. Past history of similar eruption was reported in 16.66% of patients. Other family member with similar condition was seen in only 4.7% of patients.

In the present study, 19% of patients have associated medical problems, which include hypertension (4.76%) of patients, diabetes mellitus (2.38%), rheumatoid arthritis (2.38%), fracture of humerus (2.38%), vitilgo (2.38%), chronic gastritis(2.38%) and chronic active hepatitis (2.38%). This disagrees with Raza*et al*study[(13)]where no associated medical conditions were identified.

Histopathological evaluation of erythemaabigne was done in 10 patients, as most patients refused a skin biopsy. The main histopathological changes were as follow: dilation and congestion of post capillary venules in superficial papillary dermis was the most constant feature(100%), associated with variable perivascular inflammatory lymphocytic infiltrates (90%), hyperkeratosis (30%), mild acanthosis (70%), vacuolization of basal cell layer (100%), epidermal atrophy (20%), necrotic keratinocytes(90%), rete ridges effacement (40%).

Fontana:-Masson stained sections revealed basal layer hypermelanois in 30% of patients while dermal melanophages were either normal (60%) or moderately increased(40%).

These histopathological changes explain the characteristic clinical picture of erythemaabigne, mainly the reticular erythematous and pigmented pattern. No epithelial atypia or alterations consistent with preneoplastic skin conditions were observed. Some of these findings are consistent with the previous two histopathological studies[(14, 15)] .Striking histopathological findings were observed in 3 patients. Subepidermal separation with bulla formation (pemphigoid like picture) was observed in one, and suprabasalacantholysis (pemphigus like picture) was noted in two patients, although none of these patient had any blisters clinically. To our knowledge, suprabasalacantholysis (pemphigus like) was not documented previously in medical literature.

The possible development of cutaneous squamous cell carcinoma or Merkel cell carcinoma represents the major long- term risk. The duration of heat exposure that necessary to provoke alterations in the skin varies from months to several years and the damage appears to be cumulative[(16,-18)] .In the present study, no malignant changes were observed by clinical and histopathologicalevaluation. This is possibly explained by the seasonal nature of erythemaabigne in Iraq.In conclusion, erythemaabigne is seasonal in Iraq, predominantly seen during cold winter months among young females. It is a self-limiting condition, usually fades spontaneously in summer. It has characteristic clinical and histopathological features which make its diagnosis easy. Prevention is easy, simply by avoiding direct heat exposure and hugging the heater. So, we recommend public education about this condition through different media in order to minimize its appearance.

References

[1]. Anderson RR,Parish JA. The optics of human skin. J Invest Dermatol 1989; 77: 13–9.
[2]. Dover JS, Phillips TJ, Arndt KA. Cutaneous effects and therapeutic uses of heat with emphasis on infrared radiation. J Am AcadDermatol 1989; 20: 278–86.
[3]. Pullman H, Mores E, Reinbach S. Effect of infrared and UVA rays in the human skin and their efficacy in the treatment of atopic dermatitis. Z Hautkr 1985; 60: 171–7.
[4]. 4.Tan S, BertucciV ."Erythemaabigne: an old condition new again". Canadian Medical Association Journal 2000; 162 (1): 77–78.
[5]. 5.Meffert JJ, Davis BM. Furniture-induced erythemaabigne. J Am AcadDermatol. 2000;34:516-517.
[6]. 6. Ryan R. Riahi; Philip R. Cohen. What Caused This Hyperpigmented Reticulated Rash On This Man's Back?" The Dermatologist. Jan 14, 2013.
[7]. 7. Helm TN, Spigel GT, Helm KF. Erythemaabigne caused by a car heater. Cutis. Feb 1997; 59(2):81-2.
[8]. 8. Peter Elsner, SibylleSchliemann.Erythemaabigne as an occupational skin disease.JDtschDermatolGes. 2014 Jul 29;12(7):621-2.
[9]. 9. G GGauglitz, T Ruzicka, and THerzinger.Erythema a computatro.Case Rep Dermatol. 2013 Mar.
[10]. 10. Lin ST, Hsu CJ, Chiu HC. Erythemaabigne caused by frequent hot bathing. ActaDermVenereol. 2002; 82(6):478-9.
[11]. 11. Radmanesh M. Erythemaabigne following Sauna belt use for abdominal obesity and cellulitis.Int J Dermatol. 2009 ;48(1):94-5.
[12]. 12. FalanganN,WatsonR,Sweeney E, Barnes I. Bullouserythemaabigne. Br J Dermatol1979; 115:1226-8.
[13]. 13. NaeemRaza; SyedNurulRasoolQadir; AmerEjaz.EpidemiologyofErythemaabigne at a moderately cold weather station.J Pak Med Assoc 2007; 57:146-47.
[14]. 14. Finlayson GR, Sams WM, Smith JG. Erythemaabigne: a histopathological study. J Invest Dermatol 1966; 46:104.
[15]. 15. CavallariC, Cicciarello R, Torre V, Gagliardi ME, Albiero F, Palazzo R, et al. chronic heat-induced skin lesions (erythemaabigne): ultrastructural studies. UltrastructPathol 2001; 25:93–97.
[16]. 16. ArringtonJH, Lockman DS. Thermal keratoses and squamous cell carcinoma in situ associated with erythemaabigne. Arch Dermatol 1979; 115:1226. 32.
[17]. 17. HewittJB, Sherif A, Kerr KM, Stankler L. Merkel cell carcinoma and squamous cell carcinoma arising in erythemaabigne. Br J Dermatol 1993; 128:591-2.
[18]. 18. Sigmon JR, Cantrell J, Teaque D, Sangueza O, Sheehan DJ. Poorly differentiated carcinoma arising in the setting of erythemaabigne. Am J Dermatolpathol 2013; 35(6)676-8.