

## **Epidemiology of Erythema ab igne at a moderately cold weather station**

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### **Abstract**

Erythema ab igne is a localized red brown reticular pigmentation, resulting from chronic, repetitive exposure to sub maximal heat, insufficient to cause burn. A study was carried out at the dermatology outpatient department of Combined Military Hospital, Abbottabad during January-April 2005 with the purpose to see frequency of erythema ab igne. Fourteen patients were identified, interviewed and examined in detail. Nine were females, eight of them housewives, and five were males. Age of the patients ranged from 9 to 60 years with a mean of  $36.5 \pm 14.8$  years. Body Mass Index (BMI) of the patients ranged from 13.5 to 33.5, six of them were in the BMI range of between 25.1 and 30. Nine patients belonged to rural areas. Erythema ab igne was not associated with thyroid disease or any other systemic or psychiatric illness.

### **Introduction**

Skin is important in preserving homeostasis between man and the environment. One major role of the skin is in thermoregulation; however, from a sensory point of view, the skin thermoreceptors play a relatively minor role in modifying core temperature and have a greater role in mediating behaviour. Prolonged exposure to moderate degrees of heat can result in erythema ab igne. It is a localized red brown reticular pigmentation which results from chronic, repetitive exposure to sub maximal heat, insufficient to cause burn.<sup>1</sup> The histological changes in erythema ab igne are non-specific. In early lesions epidermal atrophy and melanin incontinence occurs. Collagen degeneration along with increased amount of elastic tissue may also be seen within the dermis. In later stages, focal or confluent hyperkeratosis, dyskeratosis, keratinocyte atypia and occasionally melanocyte atypia may be seen.<sup>2,3</sup> Erythema ab igne is reversible initially, if the repeated exposure to heat is eliminated. Once the pigmentary changes appear, the eruption is long-standing.<sup>2</sup> The association of erythema ab igne with premalignant or malignant lesions, though occasionally described, seems relatively infrequent.<sup>4</sup> The associated premalignant and malignant conditions include actinic keratosis, Bowen's disease<sup>5</sup>, merkle cell carcinoma<sup>6</sup> and squa-

mous cell carcinoma.<sup>1</sup>

In developed countries, with the advent of central heating, the overall incidence of erythema ab igne is declining, although in developing countries like Pakistan, patients with erythema ab igne are still seen in each winter, particularly in cold weather areas. The purpose of this study was to see the frequency of erythema ab igne during winter season at a moderately cold weather station.

### **Patients, Methods and Results**

This study was carried out in the dermatology outpatient department of Combined Military Hospital, Abbottabad during the winter months of January-April 2005. All patients having localized reticulate hyperpigmentation of more than four weeks duration and a definite history of prolonged exposure of the affected body site to a source of heat were included. A total of 14 patients were included in the study and all of them were interviewed in detail. History included age, gender, residence and occupation of the patient. Each patient was asked about duration of the eruptions, source of heat, history of similar eruption in the past, pain, weight loss or any other symptom pointing towards any systemic illness in particular malignancy, thyroid disease or mental illness. Dermatological and physical examination were carried out in detail. Estimation of thyroid hormones was carried out in all, and antinuclear factor in female patients only. A pre-designed proforma was filled for each patient separately.

A total of 4563 patients were registered from 1 January 2005 to 30 April 2005. Of these, 14 patients (0.3%) were diagnosed with erythema ab igne. There were 9 females, most of them housewives, and 5 males. Age of the patients ranged from 9 to 60 years with a mean of  $36.5 \pm 14.8$  years. Body Mass Index (BMI) of the patients ranged from 13.5 to 33.5, Kg/m<sup>2</sup> majority of them with BMI between 25.1 and 29.9 kg/m<sup>2</sup>. Nine patients belonged to rural areas (Table). The source of heat in 7 patients from the rural areas was wood stove, while gas heater was the source of heat in all the urban patients. Duration of the eruption ranged from 4 weeks to 4 months and none of the patients had a history of similar eruption in the past.

Legs were the most commonly involved site in our study, which is in consonance with most of the previous studies<sup>1</sup>, followed by legs and thighs involved together. However, varied and sometimes bizarre patterns of the eruption may be seen anywhere due to different practices and professions. Erythema ab igne is said to be more common in obese elderly ladies.<sup>3</sup> In the study, age of female patients ranged from 24 to 50 years, and 5 (55.6%) of them were in the age group 41-50 years. Three females had BMI in the range of 30.1-35 and 3 females were in the range of 25.1-30. Rest of the 3 females had BMI less than 25. Erythema ab igne was seen in five males also, 2 of them were students who would sit near a gas heater daily for hours. BMI of 9 years old student was less than 15 kg/m<sup>2</sup> and that of the other student was more than 20 kg/m<sup>2</sup>. Two elderly men in the age group 51-60, who were jobless, also developed erythema ab igne. Their BMI was more than 25 kg/m<sup>2</sup>. One soldier who was a night guard for two months at a stretch, used to stand in front of a coal stove for most of the time and developed erythema ab igne on upper thighs medially.

Erythema ab igne developed in more than three fourth of the patients during the months of January and February, when average temperature was lowest and ranged between 5.6 and 6.0 degrees Celsius. This may indicate that it is not only the disease condition like thyroid disease or psychiatric illness which makes patients thermophilic.

### Conclusion

In all the patients, the eruption appeared for the first time and there was no previous history of similar eruption. There was no clinical or laboratory evidence of any systemic or psychiatric illness or additional cutaneous findings like blistering, crusting or keratotic lesions in any of the patients. In literature, course of the eruption in majority of the reported cases of erythema ab igne remained benign.<sup>7</sup> However, patients having erythema ab igne must be followed up at regular intervals for possible development and early detection of malignancies. Whereas, erythema ab igne can give rise to cutaneous malignancies, it can also be a useful diagnostic sign for underlying diseases including malignancies<sup>1</sup>, because of the use of heat for pain relief. The patients with erythema ab igne, therefore need to be interviewed and examined thoroughly and they should also be explained that cessation of exposure to further heat is mandatory.

**Table. Demographic profile of patients with Erythema ab igne, (n=14).**

Parameters	Females
<b>Age groups (in years)</b>	
01-10	1
11-20	2
21-30	1
31-40	2
41-50	6
51-60	2
<b>Gender</b>	
Females	9
Males	5
<b>Body Mass Index (kg/m<sup>2</sup>)</b>	
11-14.9	1
15-19.9	2
20-24.9	2
25-29.9	6
30-34.9	3
<b>Occupation</b>	
Housewives	8
Students	2
Nurse	1
Soldier	1
Job less	2
<b>Residence</b>	
Rural	9
Urban	5

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