BEETLE DERMATITIS IN PUNJAB
(A Study of 77 Cases)

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A peculiar erythemato-vesicular dermatitis caused by a beetle, seen in 77 cases is analysed. The age range was 2.5 years to 57 years. Urban to rural ratio was 3.52:1. The common sites of involvement were the exposed sites, mainly the face. Burning sensation was the commonest symptom. Lesions were tender and mainly linear. The presence of kissing lesions was suggestive of the genus *Paederus* as the cause. A typical seasonal variation with maximum numbers in July was noted. The causative beetle could not be found out because none of the patients saw it. All cases responded well to antihistamine-corticosteroid combination systemically and antibiotic-corticosteroid combination locally. The need for keeping this entity in mind is stressed while examining vesicular eruptions especially during the rainy season.

Key words : Beetle, Dermatitis.

Beetles are insects whose forewings are modified to form hard wing covers for the membraneous or reduced hindwings. They belong to the order *Coleoptera* (sheathwings). This is the largest order amongst the insects with more than 2,70,000 species.

The members of the following families of the order *Coleoptera* are important from the dermatological point of view in our country.[1]

1. Family Staphylinidae (genus Paederus)

These are known as Rove bettles or spiderlick beetles. There are more than thirty species which can cause dermatitis. The important Indian species are *Paederus fuscipes, P. irritans, P. sabacus, P. himalayicus* etc. They are normally sombrely coloured but a few may be bright red, blue or black. The body is long and slender, antennae are clubbed at the end but not flattened distally. The palps are short, pubescent and compressed. The mandibles are sickle shaped. The elytra (first pair of wings) are very short and usually brilliantly coloured and cover only two of the abdominal segments. The tarsal joints comprise three or more segments. The legs are short and are used for running. In the female, the sixth sternite of the abdomen in the ventral surface is intact. In the male, it has a narrow medium excision. The life cycle is completed within 12-14 days. The adults live in colonies. Breeding takes place in damp places near water. Eggs are laid in cracks or under rotten leaves. These beetles are predators and scavangers which feed on debris and live on dead larvae of other insects. They are very active from May to July. They are attracted by artificial lights and have the very characteristic habit of curling up their abdomen when they run or are disturbed; this allows an on-the-spot identification. They have an irritant toxic principle in their body fluids. It is present in all parts of the body of the beetle. The toxic principle is not cantharidin. The fluid contains pederin, pseudopederin and pederone. It is not emitted voluntarily. It comes in contact with the skin when the insect is crushed. This arthropod does not bite or sting, nor does it produce any lesion by just running over the human integument.

2. Family Meloidae (Blister beetles)

There are about seventy species in our country. The Indian fly (beetle) which yields

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cantharidin is known as *Mylabris cichorii* (vern. Teleni Makhi) and occurs abundantly in the rainy season in certain parts of north India and Kashmir. It is 2.5 cm long and about 0.8 cm broad. Its wing sheaths are black, marked with three broad transverse, orange yellow wavy bands which contain scattered black, bristly hair when viewed under the microscope. The head is joined to the thorax by a distinct neck. The antennae are generally moniliform with eleven segments. The elytra do not accurately meet in the midline and do not also tightly fit over the abdomen. The prothorax is narrower than the head. The legs are long and the claws are pectinate or provided with appendages resembling claws.

Fig. 1. Blister beetle, Family-Meloidae, Species-Mylabris (Punjabi University Campus, Patiala).

Pruthi[2] reports that *M. phelerata* is the commonest Indian species producing blistering eruption. *M. pustulosa* is another species which yields about 2.9 per cent cantharidin and is found in the fields of cereals and vegetables in the neighbourhood of Bangalore.[3] Other Indian species are *M. macilenta*, *Epicuta hirticornis*, *Cantharis violacea* etc. *Cantharis hirticollis*, the red headed blister beetle is very common in the eastern Himalaya from July to September. It is black with a red head and is about 22 mm long. Blister beetles feed upon pollen and tender flower petals and show a decided preference for yellow and violet petals. They are very destructive to the flowers of cucurbit crops like pumpkin and cereals like rice and millets. The larvae attack two main groups of insects—locusts and solitary bees.

The active principle, cantharidin is present in haemolymph. The average cantharidin yield of Indian species is 0.7 per cent. This is a volatile substance concentrated mostly and probably secreted in the genitalia of the beetles. It is a crystalline anhydride ($C^8H^{12}O(CO^2)O$) of cantharidic acid. A simple contact with the beetle may lead to vesication. Small quantity, even 0.1 mg, can penetrate the epidermis very quickly and can produce severe superficial ulceration and slowing forming blisters within a few hours. This substance was well known to the ancient Greeks and their word for beetle was cantharos. Cantharidin may be absorbed by the skin and cause poisoning. A case of accidental poisoning by percutaneous absorption of cantharidin from blister beetle has been reported.[4] *Epicuta* and *Mylabris* species have been used for homicidal purpose by mixing the pulverised beetle with food. Given internally,[5] cantharidin produces an intense intolerable burning pain in the mouth, throat and the stomach; tongue is swollen and blistered. There is intense thirst and salivation. Nausea and vomiting occur, the vomitus contains blood and there is blood-stained diarrhoea with tenesmus. These are followed by pain in the loins, distressing strangury, frequency, oliguria and haematuria, painful priapism in the male along with swelling and inflammation of the genitalia and abortion in females. In severe cases, marked headache, restlessness, delirium, convulsions and peripheral circulatory failure occur and the patient may die of respiratory failure.

The pathogenesis of skin lesions is explained in a way similar to that of attacks of gaseous vesicants, by a blocking of enzymes of SH groups. Like these enzymes, in fact, cantharidin inhibits glucidic metabolism and this expresses itself in the skin by the formation of blisters.[6]

Fleisher and Fox[7] have described the vesicular lesions due to Oedemerid beetle (*Oxycopis vittata*) from the United States. They could produce the disease experimentally in human volunteers, but this family is not known to cause dermatitis in India.

Materials and Methods

This study was based on seventy seven cases of beetle dermatitis seen during a period of six months (April-September 1984). A detailed history was taken in all the cases regarding residence, sleeping habits, bite or contact with an insect, constitutional symptoms, itching, burning sensation or pain and any history of similar lesions in the past. The duration, extent and nature of the lesions was recorded. Representative photographs and biopsies were taken. The biopsy material was routinely stained with haematoxylin and eosin. Patients were treated with oral antihistamine-corticosteroid combination and local corticosteroid-antibiotic combination. Systemic antibiotics were given in cases with secondary infection. As no patient could offer any clue as to the cause of the lesion, confirmation regarding the genus causing lesions could not be done.

Results

Out of a total of seventy seven cases included in this study, fifty seven were males and twenty females. Age group showed a wide range, the youngest patient being $2\frac{1}{2}$ years and the oldest 57 years of age. Maximum number (40.25 per cent) of patients were in the 21-30 years age group.

Sixty patients belonged to the urban area and 17 cases were from villages. None of the patients gave any history of bite or contact and could not ascrile the lesions to any causative agent. Six (7.79 per cent) patients gave a previous history of similar lesions in the recent past or in the preceding season. Interestingly, fifty (64.93 per cent) patients gave a history of sleeping in the open wearing only underclothes. The lesions in some such cases were also noted on areas which are normally not taken as exposed sites like lower back, scrotum, upper thighs etc. Only two (2.59 per cent) patients complained of mild fever lasting 3-4 days without any rigors or chills. Fifty-three (68.83 per cent) cases complained of burning sensation and eight (10.38 per cent) of pain; thirteen cases (16.88 per cent) presented with itching and eleven (14.28 per cent) gave no history of itching, burning or pain.

Duration of the lesions was less than five days in most (88.31 per cent) of the cases. Face was involved in the maximum number of cases (50.64 per cent) while upper limbs showed lesions in 29.87 per cent, neck in 25.97 per cent and trunk in 28.57 per cent of patients.

The type of lesion was characteristic. Forty nine (63.63 per cent) cases showed linear lesions, while kissing lesions were seen in 6 (7.79 per cent) cases. Peri-orbital region (mainly eyelids) showed lesions in 20 cases (25.97 per cent). Vesiculation or blistering was present in 33.76 per cent cases, almost all lesions were tender, about half showed oedema. Pustular lesions were present in 16 cases and only 6 cases showed ulcertaion. Tender regional lymphadenitis was present in only 4 cases.

All patients responded well to treatment. The lesions healed leaving behind hyperpigmentation in less than seven days in 70 (90.90 per cent) cases and in two weeks time in only seven cases. Maximum number (74.02 per cent) of cases were seen in the months of June, July

and August. The maximum number of cases were reported in July (32.46 per cent).

Biopsy taken thirty six hours after onset of the lesions from a non-blistered, erythematous, oedematous, linear lesion showed hyperkeratosis, acanthosis, spongiosis and necrosis in the epidermis. There was a dense focal round cell infiltration in the upper dermis. A few polymorphs were also seen. Dilatation of vessels in the upper dermis was also present. A lesion of seventy two hours duration showed similar changes without spongiosis, while the round cell infiltration in the upper dermis was mild.

Comments

Lehmann et al[8] first described the blister beetle dermatosis, but still the diagnosis is often missed. Many such cases are mistaken for cases of allergic contact dermatitis without ascertaining the cause. The present study indicates a high incidence of beetle dermatosis in Punjab in the months of May to September. Similar seasonal incidence has been reported in two cases by Bhargava and Gupta[9] from Jaipur. They reported that the lesions are commonly seen over the exposed parts of the body i. e. the face, forehead, cheeks, under the chin, 'V' of chest, forearm, lower part of the abdomen, lower part of the legs and dorsum of feet. The present study confirms this finding. Ray[10] reported beetle dermatitis due to the genus *Paederus*. The presenting lesion has been described as an erythematous plaque, studded with blisters not unlike that produced by application of local vesicants including cantharidin. Kerdel Vega sand Goihman-Yahr[11] described lesions due to the genus *Paederus* as erythematous and oedematous with vesicles that appeared generally towards the centre of the plaque. The vesicles frequently turned into pustules. The signs appeared about 24-48 hours after the contact and took a week or more to disappear. Transitory hyperpigmentation lasting a few weeks was noticed in some cases. Scarring was not seen. A rather striking feature was the presence of kissing lesions that occurred whenever apposition of damaged areas to the previously intact skin was possible. The dermatitis affected persons of all ages, sexes, races and social status. The histopathological picture depended upon the stage of dermatitis. In the early vesicular stage, these were intraepidermal vesicles, the top of the vesicle was usually formed by the horny layer or by one or two rows of flattened cells. The floor consisted of the basal cell layer and sometimes one or more strata of malpighian cells. In the dermis, there was a perivascular infiltrate, more marked in the papillae and upper reticular dermis. It consisted mainly of mononuclear cells but there were also some polymorphonuclear cells.

Fig. 2. Kissing lesions—a striking feature in Paederus dermatitis.

There was oedema, more marked at the papillae in some biopsies. In the pustular stage, the above mentioned characteristics were exaggera-

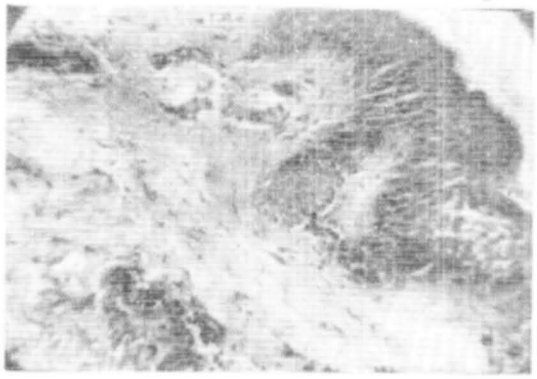

Fig. 3. Spongiosis and necrosis of epidermal cells with a mononuclear infiltrate in the dermis (x 200).

ted, the vesicles changed into pustules full of neutrophils that also were seen migrating through the neighbouring areas of epidermis as well as in the papillae. Finally, all that remained was a crust, some acanthosis, and a mild perivascular infiltrate. The histopathology of our cases closely resembles the above description.

The treatment of these lesions includes oral antihistamines or/and corticosteroids and local cold compresses.[9,11] Deneys and Zumpt[12] who have seen many cases caused by *Paederus sabacus* in South West Africa, however, have recommended compresses with magnesium sulphate and methyl alcohol packs. They reported that cortisone and antihistamines are not effective and they may often favour secondary infection. In the present study, however, all cases responded very well to oral antihistamine-corticosteroid combination and local corticosteroid-antibiotic combination.

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