

# A Clinical Study of Papular Urticaria

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## ABSTRACT

**Objective:** To determine the clinical features and demographic profile of the patients having papular urticaria.

**Study Design:** A case-series.

**Place and Duration of Study:** Dermatology Department of Combined Military Hospital, Abbottabad from January to December 2006.

**Patients and Methods:** Individuals of all age groups and either gender either suspected of or having definite history of insect bite were included in the study. A specially-designed proforma was filled for each patient separately. The proforma included demographic features, information regarding clothing and sleeping habits, personal or family history of atopy and clinical patterns of the lesions. Computer programme SPSS 10 was used to manage and analyze the data.

**Results:** Out of 280 patients, 201 (71.8%) were children upto 12 years of age, 178 (63.6%) were males, 91 (32.5%) had atopy, 194 (69.3%) were non-locals, 212 (75.7%) came from urban/peri-urban areas and 173 (61.8%) presented during May-August. Lesions were present over exposed parts of the body in 36 (12.9%), arranged in groups in 152 (54.3%) and were papular urticaria in 185 (66.1%) patients.

**Conclusion:** Children, adult males, non-locals and those belonging to urban/peri-urban areas are more vulnerable to papular urticaria in a particular region. Papular and urticarial lesions arranged in groups over both exposed as well as covered body parts of a single patient is the most common clinical pattern.

**Key words:** *Papular urticaria. Insect bite. Bedbug. Arthropods.*

## INTRODUCTION

Arthropod bites and stings are capable of inflicting injury, inciting allergic reactions ranging from annoying to life threatening in sensitized persons, and transmitting systemic disease.<sup>1</sup>

Many insects feed on other animals. Humans are hairless and provide an easy target especially when partially clothed.<sup>2</sup> Most of the encounters with biting and stinging insects result in more or less pronounced localized reactions. Typically, urticarial wheals and papular reactions are observed. Less often, local bullous, haemorrhagic or disseminated papular reactions, particularly in children and immunologically naive adults, may be seen.<sup>3</sup> With the exception of bee and wasp venom allergies, immediate-type allergic reactions to arthropod stings and bites are rare.<sup>3,4</sup>

Papular urticaria is a common and often distressing disorder manifested by chronic or recurrent papules caused by a hypersensitivity reaction to the bites of mosquitoes, fleas, bedbugs, and other insects. Individual papules may surround a wheal and often have a central punctum. Severity is often related to the host response to the salivary or contactant proteins. The histopathology of papular urticaria consists of mild subepidermal edema, extravasation of erythrocytes, interstitial eosinophils, and exocytosis of lymphocytes.<sup>5</sup>

Papular urticaria is a common problem encountered in dermatology outdoor clinics, particularly in green and rainy areas of Pakistan, but to the best of authors' knowledge no study in this regard has so far been published from Pakistan. This study was conducted to provide baseline information regarding clinical aspects of this important public health problem, which has significance owing to the ever increasing concern regarding disease transmission by insects.

The objectives of this study were to determine frequency, clinical features and demographic profile of the patients having papular urticaria.

## PATIENTS AND METHODS

This study was conducted at Dermatology Outpatient Department of Combined Military Hospital, Abbottabad over a period of one year from January to December 2006. Patients of all age groups and either gender,

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reporting during the above-mentioned period with definitive history or localized reactions, clinically suggestive of insect bites were included in the study. These lesions included localized urticarial papules with central punctum in anyone or more of these lesions. Patients with doubtful lesions were excluded from the study. Selection of the patients was done on the basis of non-probability purposive sampling.

All the selected patients were interviewed in detail and examined thoroughly. A specially-designed proforma was filled for each patient separately. This proforma included date, age and gender of the patient, whether the patient was local or non-local in relation to the place under study, whether belonged to rural or urban area, duration of the eruption, sleeping habits, clothes worn at night, personal or family history of atopy and number of other family members having similar lesions. The patients were examined in detail and dermatological examination included site, number, pattern and morphology of the lesions. These clinical findings were also recorded. Computer programme SPSS version 10 was used to manage and analyze the data. Frequencies and percentages were obtained for the variables where applicable. Mean and standard deviation were calculated for continuous variables.

## RESULTS

A total of 14019 patients reported sick in Dermatology Outpatient Department of Combined Military Hospital, Abbottabad during the study period. Out of those, 280 (1.99%) patients were having papular urticaria and included in the study. Two hundred and one (71.8%) patients were upto 12 years of age and 79 (28.2%) were above 12 years. Age of the patients upto 12 years ranged from 4 months to 12 years with a mean of  $3.63 \pm 2.62$  and that of patients over 12 years ranged from 13-38 years with a mean of  $23.44 \pm 6.73$ . Total number of children upto the age of 12 years having various dermatological problems was 1450 and 201 (13.86%) out of those had papular urticaria. Out of 280 patients having papular urticaria, 178 (63.6%) were males.

Majority of the patients (n=173, 61.8%) presented during the months of May-August with maximum number of patients during the month of August (n=51, 18.2%) and minimum number of patients during November (n=03, 1.1%). More than two-third patients (n=194, 69.3%) were non-locals. Two hundred and twelve (75.7%) patients came from urban or peri-urban areas (Table I).

One hundred and eighty-seven (66.8%) patients presented with first episode of papular urticaria and 17 (6.1%) patients had periodic episodes of the eruption for more than three years duration. Regarding sleeping habits, 274 (97.9%) patients slept indoor, 143 (51.1%) slept on wooden bed and mattress and 167 (59.6%) wear full sleeves while sleeping at night. History of atopy

**Table I:** Demographic profile of the study population (n=280).

| Parameter                  | Number | Percentage |
|----------------------------|--------|------------|
| <b>Age groups (years)</b>  |        |            |
| Upto 12                    | 201    | 71.8%      |
| Over 12                    | 79     | 28.2%      |
| <b>Gender</b>              |        |            |
| Male                       | 178    | 63.6%      |
| Female                     | 102    | 36.4%      |
| <b>Permanent residence</b> |        |            |
| Locals                     | 86     | 30.7%      |
| Non-locals                 | 194    | 69.3%      |
| <b>Present residence</b>   |        |            |
| Urban/peri-urban           | 212    | 75.7%      |
| Rural                      | 68     | 24.3%      |

was present in 91 (32.5%) patients. Family history of insect bites was present in 75 (26.7%) patients.

Dermatological examination revealed that 180 (64.3%) patients had lesions over both exposed as well as covered parts, whereas 36 (12.9%) patients developed lesions only over exposed parts of the body. In majority of the patients (n=159, 56.8%), the number of lesions was between 6 and 15. Lesions were arranged in groups in 152 (54.3%) and linear distribution was evident in 28 (10.0%). Urticarial papules were the most common presentation (n=185, 66.1%), followed by vesicular lesions (n=64, 22.9%, Table II).

**Table II:** Clinical patterns of papular urticaria (n=280).

| Parameter                    | Number | Percentage |
|------------------------------|--------|------------|
| <b>Site</b>                  |        |            |
| Exposed                      | 36     | 12.9%      |
| Covered                      | 64     | 22.9%      |
| Both (exposed and covered)   | 180    | 64.2%      |
| <b>Number of lesions</b>     |        |            |
| 01-15                        | 184    | 65.7%      |
| >15                          | 96     | 34.3%      |
| <b>Pattern of lesions</b>    |        |            |
| Grouping                     | 152    | 54.3%      |
| Discrete                     | 100    | 35.7%      |
| Linear                       | 28     | 10.0%      |
| <b>Morphology of lesions</b> |        |            |
| Papular/urticarial           | 185    | 66.1%      |
| Vesicular                    | 64     | 22.9%      |
| Bullous                      | 16     | 05.7%      |
| Excoriated papules           | 06     | 02.1%      |
| Purpuric                     | 06     | 02.1%      |
| Eczematous                   | 03     | 01.1%      |

## DISCUSSION

Bites and stings from arthropods are largely inevitable because of the number of offending species and their distribution throughout our environment. Papular urticaria is most often caused by fleas or bedbugs bites, but virtually any arthropod is capable of inducing such a reaction.<sup>6</sup> Multiple bites and local pruritus are characteristic symptoms. Bedbug bites typically cause pruritic wheals with central punctum on exposed skin, which are noted upon awakening. They are often source

of great irritation and sleepless nights.

Children seem to be at greatest risk, although adults are also vulnerable.<sup>6-8</sup> In a study conducted by Ruiz-Maldonado *et al.* at Mexico, it was found that papular urticaria was the most frequently observed dermatosis (16.3%) among children. They did not find significant difference among gender of the patients.<sup>9</sup> In this study too, 13.8% paediatric patients presented with papular urticaria and there was no significant difference between gender of the children. However, there was a gross difference of gender among adults. More adult males (n=59, 74.7%) presented with papular urticaria than females (n=20, 25.3%). The reason probably is that in our socioreligious setup, women mostly remain clad in clothes even while sleeping and are protected from insect bites.

Fleas and other insects thrive well during wet and foggy summer months and that is why cases of papular urticaria are commonly seen particularly during these months.<sup>5,10</sup> Moreover, during these months, there are more chances of exposure to the insects as people generally wear light clothes even at night. In this study, more than half of the cases presented during the summer months of May-August with maximum patients reporting in August.

It is not surprising that only around one-fourth of the patients in this study had history of similar eruption in the family. The insects are attracted to humans because of body heat, body odour, perfumes and colourful clothings etc. The same insect might have bitten other family members also but the clinical picture of insect bites substantially varies between individuals, depending upon previous exposure and the degree of an immune response.<sup>11</sup> Some individuals may not even react clinically to the bite. Clinical manifestations of papular urticaria are mediated by a complex immune response involving more than one mechanism, with evidence for both an IgE response and a cell-mediated type IV response.<sup>12,13</sup> Non-atopics also react to insect bites, but sensitization may occur more readily in atopics.<sup>14</sup> Ninety-one (32.5%) of the reported patients had history of atopic symptoms.

Lesions of papular urticaria are commonly present over generally exposed parts of the body.<sup>15,16</sup> However, majority of patients (n=244, 87.14%) had lesions of papular urticaria over covered parts of the body, either involving only covered parts (n=64, 22.9%) or in addition to involvement of exposed parts of the body. Lower trunk was the most commonly involved covered site of the body in this study. In the local sociocultural setup, loose shirt is worn and is not tucked in the lower. During sleep, there is likelihood that loose shirt does not remain in position and lower trunk gets exposed to bedbugs and other insects. It is, therefore, advisable to tuck the shirt, vest or undergarment in the lower to minimize risk of

insect bite at that site.

The type of reaction provoked by insect bite depends on previous exposure; repeated bites may lead to the development of an allergic reaction, which may lead to pronounced cutaneous manifestations. Moreover, insects often inject different pharmacologically active substances e.g. hyaluronidase, proteases, histamine and kinins etc., which may cause different skin reactions like, erythema, wheal, vesicle, bulla or haemorrhagic nodule.<sup>4,15</sup> Secondary bacterial infections or eczematous change may complicate these lesions. The classic presentation of papular urticaria includes recurrent pruritic papules or vesicles and varying degrees of local edema.<sup>7</sup> Urticarial papules were the most common presentation in our patients, followed by vesicular lesions. Papular urticaria lesions are usually patterned; they are either arranged in groups or in a linear fashion.<sup>17</sup> Discrete lesions are also not uncommon. Majority of the patients in this series had lesions arranged in groups.

The diagnosis of arthropod bites and stings is dependent on maintenance of a high index of suspicion and familiarity with the arthropod fauna in the region. Although, this study does not include efforts to identify the offending insects, thorough investigation including, at times, environmental inspection is necessary to reach the rewarding discovery of the etiology of household papular urticaria. The diagnosis of bedbug bites is confirmed by identifying fecal smears and blood spots on the bed linens and mattress or by identifying the culprit bug.<sup>16</sup>

Further studies are recommended to find out magnitude of the problem in community, to identify the common offending insects in this region and to present recommendations for specific prophylactic measures and treatment.

## CONCLUSION

Children, adult males, non-locals and those belonging to urban/peri-urban areas are more vulnerable to papular urticaria. Papular and urticarial lesions arranged in groups over both exposed as well as covered parts of a single patient is the most common clinical pattern of papular urticaria.

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