# **Original Article**

# Cutaneous manifestations in patients of dengue fever

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Abstract *Objective* To observe the spectrum of cutaneous changes in patients of dengue fever.

**Patients and methods** The study was carried out from April 2010 till October 2011. Three hundred cases of dengue fever were enrolled from the outpatient and inpatient departments of Jinnah Hospital, Lahore. Patients meeting the inclusion criteria were subjected to detailed history, physical examination and relevant investigations. The data was recorded on a pro forma and later analyzed.

**Results** Out of 300 patients with dengue fever, 67.3 % were males and 32.7 % were females. The mean age was 35 years with an age range of 2 to 80 years. Cutaneous manifestations were present in 65% of patients. Commonest skin manifestation was pruritus which was present in 69.2% patients. This was followed by burning of extremities which was present in 64.6% patients. A skin rash was present in 42.9% patients. This rash was macular in 31.7% and papular in 11.2% patients. A petechial eruption was seen in 20% patients, while ecchymosis was seen in 13.8% patients. Mucosal involvement was seen in 40.66% patients.

*Conclusion* Skin manifestations are a common feature of dengue fever and were seen in 65% of our patients.

#### Key words

Cutaneous manifestations, dengue fever.

#### Introduction

Dengue fever is a viral illness caused by the dengue virus, a single-stranded RNA virus, belonging to the genus Flavivirus. It is transmitted mainly by the bite of the mosquito *Aedes aegypti* which is the major vector and the true reservoir for the virus.<sup>1</sup>

The global incidence of dengue has grown dramatically in recent years. According to WHO

Address for correspondence Dr. Nadia Ali Azfar Senior Registrar, Dermatology Department Unit 1, Jinnah hospital, Lahore. Email: nadiaazfar@hotmail.com Ph: +92 300 458 0871 about half of the world's population is at risk. It is endemic in more than 100 countries.<sup>2</sup> In Pakistan the disease is around for the past 20 years and the country is now in the middle of dengue resurgence.<sup>3</sup> Two major outbreaks occurred in Karachi in the year 1994 and 2006.<sup>4</sup> Recently there has been considerable morbidity and mortality in Punjab with more than 15,000 cases been recorded in Lahore alone.<sup>5</sup>

Various cutaneous manifestations have been reported in 50 to 82 % cases of dengue fever but a varied presentation has been noted.<sup>6,7</sup> A maculopapular, scarlatiniform or morbilliform rash has been observed in the febrile phase of the disease. Petechial and haemorrhagic manifestations have also been reported. Mucosal involvement has been estimated to occur in 15% to 30% of patients.<sup>8</sup>

Skin lesions may be the presenting feature of dengue fever and can be helpful in the diagnosis of the disease. Hence, a clear understanding of these skin manifestations is required for clinicians to diagnose and treat the condition accordingly. Uptil now few studies are available regarding the spectrum of cutaneous features of dengue infection. The purpose of this study was to observe the pattern and frequency of mucocutaneous manifestations in patients of dengue fever in our set up.

#### **Patients and methods**

This cross-sectional study was carried out in the department of dermatology, Jinnah hospital Lahore, from April 2010 till October 2011. Patients of suspected dengue fever were enrolled from the outpatient and inpatient departments. Patients having systemic illnesses such as diabetes mellitus, chronic renal failure, chronic liver disease, collagen vascular disease such as systemic lupus erythematosus were excluded from the study. An informed consent was obtained. A detailed history was taken. Clinical examination to assess the various cutaneous features was carried out and relevant investigations such as hematocrit, platelet count, liver function tests and serology were done. Due to the massive turnover of patients serology could not be done in all cases. The data was entered on a pro forma and later analyzed. Frequencies of various cutaneous findings were noted.

## Results

A total of 300 patients were enrolled in the study. There were 202 males and 98 females. The male: female ratio was 2:1.

**Table 1** Cutaneous manifestations seen in denguefever (n=300).

Cutaneous features	N (%)
Macular rash	62 (31.7)
Papular rash	22 (11.2)
Petechiae	39 (20)
Ecchymosis	27 (13.8)
Pruritus	135 ( 69.2)
Burning	126 (64.6)
Flushing	56 (28.7)
Desquamation	24 (12.3)

1	Table 2 Frequency of mucosal involvement in	L
	patients of dengue fever/	

Mucosa involved	N (%)
Oral	85 (43.58)
Nasal	40 (20.51)
Eyes	33 (16.92)
Genital	1 (1.54)

The age range was from 2 to 80 years. Mean age was  $34.88 \pm 15.14$  years. Most of the patients belonged to the age group of 21 to 30 years followed by the age group of 31 to 40 years.

195 (65 %) patients showed one or more skin manifestation. Two or more features were seen in 60.3% patients. Of the various cutaneous generalized pruritus was changes, most frequently observed, seen in 69.2% patients (Table 1). This was followed by burning in 64.6% patients. The burning was felt more over hands and feet. A macular rash was seen in 31.7% while a papular rash was seen in 11.2%. Petechiae were present in 20 % cases and 13.8%.Desquamation ecchymosis in was observed in 12.3%.

Mucosae were involved in 40.66% patients (**Table 2**). 52.46% patients showed involvement of more than one mucosa. Oral mucosa was the most frequently involved (43.58%).

## Discussion

Dengue fever is a rapidly growing public health problem especially of the tropical and

subtropical countries. Estimates have suggested that 50 to 100 million cases of dengue occur annually.<sup>9-11</sup>

A total of three hundred cases of dengue fever were enrolled in our study with male to female ratio of 2:1. Studies conducted in Asia have examined this gender variation and have reported a greater male incidence.<sup>12,13</sup> Male predominance has also been reported in dengue surveillance data from the Philippines for 2010 and from Singapore for 2009.<sup>14</sup>

Most of our patients belonged to the age group of twenty one to thirty years, with a mean age of 35 years, hence dengue was observed as an adult disease rather than a pediatric problem. This was similar to the study by Saleem who observed maximum cases in the age group of 20- 40 yrs.<sup>3</sup> Although there are relatively few reported cases among children, a high fatality has been observed in this age group.<sup>15</sup>

The spectrum of dengue varies from asymptomatic infection to death. Cutaneous findings are prominently seen in patients of dengue fever and have been reported to occur in 80% of patients.<sup>16</sup> According to a study conducted by Thomas et al, in which 124 cases of dengue viral illness were studied; skin manifestations were seen in 46.8% patients.<sup>8</sup> In our study 65% patients were seen to have one or more cutaneous feature. Another study conducted in Karachi reported an almost similar incidence of 68%.<sup>3</sup>

More than 50% of infected patients report having a rash during the febrile period.<sup>8</sup> This rash is considered to be due to interaction of the virus with the host cells causing release of different chemical mediators and initiation of immunological mechanisms. Histopathology has revealed changes in the endothelium of blood vessels, perivascular edema, as well as, infiltration of mononuclear cells, while no change occurs in the epidermis, dermis or subcutaneous tissue.<sup>17</sup> In our study rash was seen in 42.9% patients which was consistent with the findings of Mahmood *et al.*<sup>15</sup> who reported a frequency of 41%. It was a generalized, macular eruption in 31.7% while a papular rash was seen in 11.2%. In a previous study a macular rash was reported in 65% of cases.<sup>3</sup> This variation of incidence maybe due to different strains of the virus.<sup>18</sup>

Although the rash in dengue fever is usually asymptomatic, pruritus is reported in different studies, ranging from 16% to 27.6%.<sup>19,20</sup> In our study, severe, generalized pruritus was the major finding observed in 69% of patients. This observation was consistent with reports from Brazil by Noqueiro *et al.* who found pruritus in 50.5% patients.<sup>21</sup>

Burning over palms and soles was another major finding in our study seen in 64.6% patients. A study conducted in Karachi<sup>3</sup> observed itching over palms and soles in 30% patients. Burning of acral areas has not been previously documented. The reason for this variation seen in different studies is unclear, however different climatic and psychosocial factors, as well as, difference in viral serotypes maybe implicated. Desquamation of acral areas<sup>22</sup> has been observed as a late feature in patients of dengue fever. In our study it was found in 12.3% patients. Previous data regarding this feature is unavailable.

Hemorrhagic manifestations are considered to be a hallmark of dengue, especially of dengue haemorrhagic fever and dengue shock syndrome. In our study petechiae were present in 20% cases and ecchymosis in 13.8%. Saleem and Shaikh reported petechiae in 35% cases and ecchymosis in 4%.<sup>3</sup>

Mucosal involvement is estimated to occur in 15% to 30% of patients with dengue viral infections.<sup>8</sup> The mucosal manifestations noted in dengue viral infections are conjunctival and scleral injection, small vesicles on the soft palate, erythema and crusting of lips and tongue.<sup>20</sup> 40.66% of our patients showed involvement of mucosae, with most frequent involvement of the oral mucosa (43.58%). The major finding was erythema of the buccal mucosa and palate as compared to other studies reporting vesicles over soft palate in more than 50%.<sup>23</sup> Conjunctival involvement was observed in 16.92% of our patients and was same as reported in a previous study.<sup>3</sup>

# Conclusion

A variety of cutaneous features were observed in patients of dengue viral infection. The commonest skin features were itching and burning of skin which may or may not be accompanied by a skin rash. The frequency of dengue fever outbreaks has increased in our country. Early recognition of cutaneous features is important as dengue fever may progress to the life threatening dengue hemorrhagic fever or dengue shock syndrome.

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