Cutaneous manifestations of dengue fever

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Introduction

In Sri Lanka, as in the rest of the world, a dramatic increase in the incidence of dengue fever has been recorded in the past few years making dengue fever (DF) and dengue haemorrhagic fever (DHF) endemic in Sri Lanka. During the year 2003 a total of 4672 cases of dengue fever had been reported and this number had reached 5786 by the first six months of 2004 signalling the gravity of the problem.

Though dengue infection is a very popular research topic leading to a vast number of studies conducted throughout the world, a surprisingly small number of these had concentrated on cutaneous and mucosal manifestations of this illness. Whatever the small number of studies available in this area had been conducted mainly in European countries with a relatively small number of subjects. This together with the fact that there is no published data on Sri Lankan patients regarding cutaneous manifestations of dengue fever led us to conduct this study.

Aims

1. To assess the incidence of cutaneous manifestations in the patients diagnosed as having dengue fever and dengue haemorrhagic fever.

2. To describe the types of cutaneous manifestations associated with dengue fever and DHF.

3. To identify any probable prognostic value in each type of skin lesion.

Method

All patients who were diagnosed as having dengue fever based on clinical and laboratory criteria (positive dengue serology when available, fever, dropping platelet count, skin eruption and being from an endemic area presenting in an epidemic period) and took inward treatment in the wards 1, 2 and 10 at the Teaching Hospital, Ragama, Sri Lanka, during the 10 week study period from 01.07.2004 to 15.09.2004 were included in our study.

Serological confirmation was not available in some cases.

Relevant information about each patient was recorded using a pretested data collection sheet by four medical officers.

Results

During the period of study a total number of 170 patients were diagnosed as having dengue fever in the three wards considered. Out of this 82 were included in our study because of presence of cutaneous manifestations.

The age of the subjects ranged from 2 ½ to 62 years with 43.9% of the patients falling between 21-30 year age group (Figure 1). The time taken for skin manifestations to appear (i.e. from the onset of febrile illness) ranged from one to eight days (Figure 2).

When the type of the skin lesions was considered a significant number of patients (20.72%) had more than one type of skin lesion (Table 1).

Table 1. Site of involvement

Site	*Number*
Face (F)	15
Neck (N)	20
Trunk (T)	66
Upper limb (UL)	63
Lower limb (LL)	57

Figures 1-6 show various skin manifestations of DF.

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The majority of the patients (i.e. 72 out of 82) had skin involvement in more than one body area (Table 2).

Table 2. Type of skin rash

Type of rash	*Number*	*%*
Macular	55	67.07
Papular	1	1.21
Purpuric	18	21.95
Maculo-papular	18	21.95
Other	5	6.09

Seventy two patients (87.8%) showed evidence of spreading of the rash. In 19.51% the skin rash spread from the trunk to limbs. While in 69.51% it spread from the limbs to trunk when associated features are considered interestingly Presence of whitish areas within the involved skin was noted in 41.46% of the subjects (i.e. 34 patients) (Figure 2).

Desquamation of skin lesions was seen only in 12.19% of the subjects (i.e. 10 patients). Pruritus was present in only 30.48% of the subjects (i.e. 25 patients).

Outcome of the study subjects is shown in Table 3.

Table 3. Disease outcome

Outcome	*Number*	*%*
Death	-	0
Major haemorrhage	7	8.53
Minor haemorrhage	12	14.63
Uncomplicated	56	68..29
Other (effusions etc.)	7	8.53

Finally the relationship between type of skin lesion and the disease outcome is demonstrated in Table 4 and 5.

Table 4. Type of rash in patients with major haemorrhage

Type of rash	*Number*
Purpuric	3
Papular	-
Macular	6
Maculo-papular	4
Other	1

Table 5. Type of rash with patients with minor haemorrhage

Type of rash	*Number*
Purpuric	2
Papular	-
Macular	4
Maculo-papular	3
Other	1

Commonest type of skin lesions in the subjects that developed minor haemorrhages (12) and the ones who developed major haemorrhages (07) were analyzed and compared with the type of the lesions that occurred in the subjects with an uneventful recovery.

Discussion

According to the results of our study 82 out of a total of 172 dengue patients had cutaneous manifestations, an incidence of 48.23%, in the study cohort. This is a relatively low value compared to 79.2% incidence described in a study done in Singapore and 69.2% incidence in a study in Taiwan[6,8].

A significant proportion of subjects (i.e. 43%) were between 21-30 years of age and 79.26% of the subjects were less then 30 yrs. A similar age distribution was noted in a study conducted in Lucknow, India[9], in which the age group most affected was 11-30 yrs.

The time taken for skin manifestations to appear (i.e. time from onset of the febrile illness to appearing of skin change) showed a surprisingly wide time range but in the majority the rash appeared between day 3 and 5, mean time being 4.07 days. When the paediatric population is considered separately the mean time was 5.12 days.

A significant proportion of the subjects (20.8%) had more than one type of lesions. The most common type was erythematous macular lesions, in contrast to the typical textbook description of a morbilliform rash[5]. But two studies done in France[1,2] show a similar result to our observation. A significant number of the subjects (24.04%) with macular type skin lesions had an associated purpuric rash as well. Overall incidence of purpura was 21.95%, significantly lower than the 52.3% described in a study conducted in Singapore[6].

Only 12.19% of the subjects (10 patients) showed skin desquamation following the rash (Figure 1). However, some may have developed desquamation after getting discharged from the hospital.

A few patients had exfoliation of the skin on palms and soles in the recovery phase (7-14 days). 30.48% of the subjects had associated pruritus and in 41.46% of the subjects whitish areas were seen within the area of the rash. These whitish islands of normal skin within large areas of erythema appears, to be a characteristic phenomenon (Figure 2), though not pathognomonic of dengue fever. Initially (1-3 days) the macular erythema is blanchable (Figure 4) but later (5-7days) erythema becomes nonblanchable. Subsequently the erythema fades away gradually.

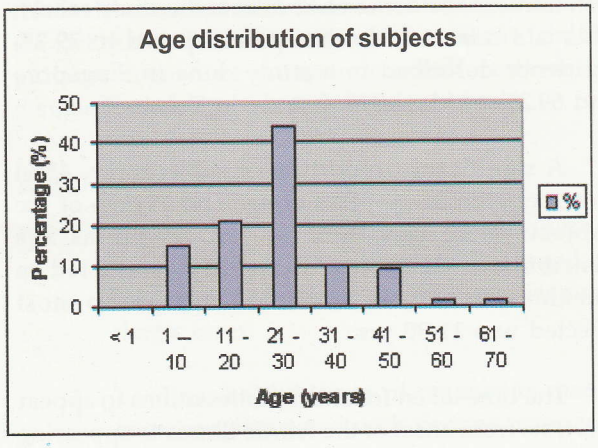
One patient had toxic epidermal necrolysis due to allergy to amoxicillin. This patient was successfully managed in the ICU conservatively. When considering the sites involved we could see that 86.58% of the study group had involvement of more than one body area. 34 patients (41.46%) had involvement of trunk upper and lower limbs (commonest combination).

Some authors claim that the rash is commonly seen in palms, soles, face and neck[4]. But in contrast to this in our study only 15 and 20 patients had facial and neck involvement respectively. In the majority of the patients the rash did not remain confined to the original site and 87.8% of the subjects showed evidence of spreading of the rash. In contrast to the peripheral extension of the rash described in a previous study[3] in 79.12% of our subjects (who had spreading) rash showed central extension (i.e. from limbs to trunk). Mucosal involvement was not seen very frequently with only 3 cases of conjunctival haemorrhages (Figure 6) and four cases of gum bleeding.

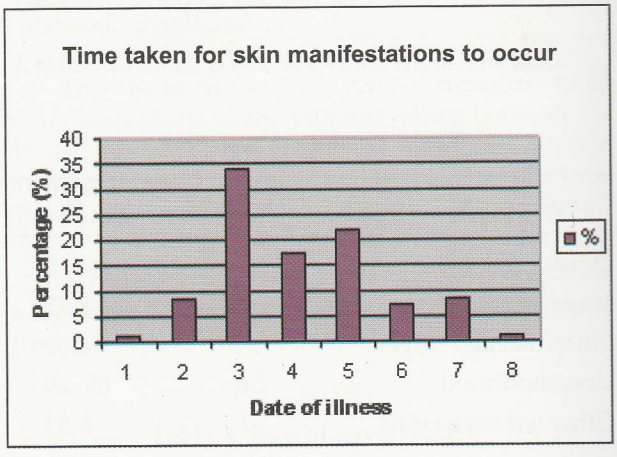
68.29% of our study patients had uncomplicated uneventful recovery from the infection while 8.5% and 14.6% experienced major and minor haemorrhages respectively. However, there were no deaths.

Annex 1

Graph 1. Age distribution



Graph 2. Time taken for skin manifestations to occur



Annex 2

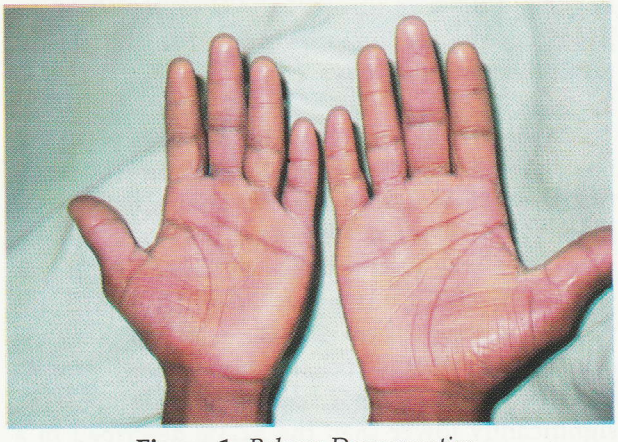


Figure 1. *Palmer Desquamation.*

Figure 2. *Islands of sparing.*

Figure 3. *Papular rash.*

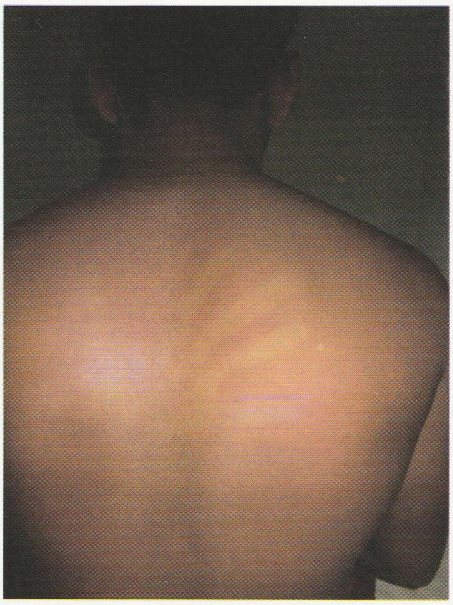


Figure 4. *Blanchable Erythema.*

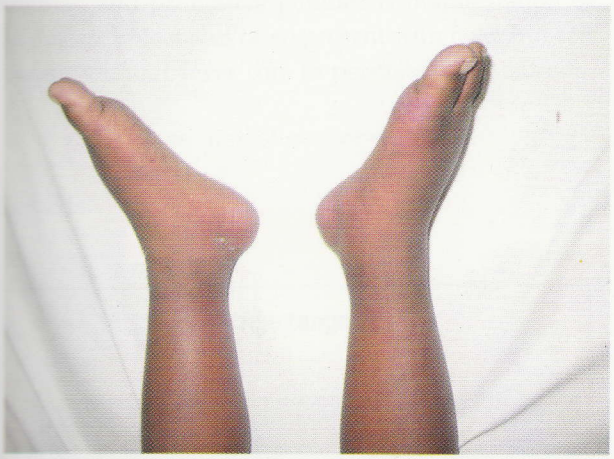


Figure 5. *Macular rash.*

Figure 6. *Conjunctival haemorrhages.*

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