

# Frequency of Pruritic Rash in Patients with Dengue Fever Presenting to a Tertiary Care Hospital

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## ABSTRACT

**Objective:** To find out the frequency of pruritic rash in patients presenting with dengue fever.

**Methods:** This cross-sectional study was carried out at Medical "C" Unit, MTI Hayatabad Medical Complex (HMC), Peshawar, from 10th August to 12th November 2018. Through consecutive sampling, a total of 147 patients presenting with dengue fever admitted at the Medical "C" Unit were enrolled for the study. The diagnosis of dengue fever was made based on positive NS1 Antigen and/or positive IgM antibodies. Patient self-reporting and/or physical examination were used to find out the pruritic rash in patients.

**Results:** Out of a total of 147 patients, 90 were male. Age ranged from 20 to 70 Years (Mean 27 years  $\pm$ 14.52 SDs). Pruritic skin rash was found in 60 (40.81%) patients presenting with dengue fever.

**Conclusion:** We have found that pruritic rash is one of the common manifestations of dengue fever. It was significantly more common in female patients.

**Key Words:** Dengue Fever; Pruritus; Rash; Serology.

## Introduction

Dengue fever (DF) is a viral illness that spreads through *Aedes aegypti* female mosquito bite and is caused by an RNA virus of the Flaviviridae family which also includes West Nile and yellow fever viruses.<sup>1</sup> The incubation period of dengue fever is about 3-8 days. According to WHO, about half the world's population is at risk. It is common in more than 100 countries. In Pakistan, the disease has been present for the past 20 years, and now the country is amid a resurgence of dengue. Clinically, dengue infection occurs with three stages of classical dengue fever, dengue hemorrhagic fever, and dengue shock syndrome.

The most common dengue fever is characterized by a rapid onset of high-grade fever, often accompanied by severe retro-orbital headache, myalgias, arthralgias, nausea, vomiting, and macular or maculopapular pruritic rash. Additional features are flushed facies, sore throat, and peripheral hyperesthesia.<sup>2</sup> About 50-82% of the patients have different types of cutaneous manifestations with dengue fever.<sup>3</sup> The pruritus usually begins in the dorsum of the hands and feet and then spreads to the arms, legs, and torso and lasts for a few days, and subsides without breaking down. Morbilliform, maculopapular outbreaks often spare the palms and feet.<sup>4</sup> The frequency of pruritic rash has ranged from 16 to 41.8% in different studies.<sup>4-6</sup>

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This study aims to determine the frequency of pruritic rash in patients with dengue fever as there is a dearth of data regarding the subject. Moreover, this study may provide a basis for further large-scale research on the subject.

## Material & Methods

This research work was carried out in the Medical "C" Unit of a tertiary care hospital, Hayatabad Medical Complex, Peshawar, Pakistan from 10<sup>th</sup> August to 12<sup>th</sup> November 2018. Ethical approval for the study was granted by the hospital ethical committee. This was a descriptive cross-sectional study, where a total of 147 patients admitted with dengue

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fever were enrolled in the study. The diagnosis of dengue fever was made by a positive NS1 antigen and/or positive IgM serology.<sup>6</sup> Pruritic rash was determined by patient self-reporting and physical examination<sup>7</sup> finding of a generalized pruritic maculopapular or morbilliform rash. Informed consent was taken from all the patients enrolled in the study. The data including demographic parameters and the presence or absence of rash were documented on structured proformas.

Data analysis was done with SPSS version 21.0 to calculate frequencies and percentages for categorical variables and means / standard deviations for continuous variables. The statistical difference between the frequency of pruritic rash concerning age and gender was

determined by the Chi-Square test, using  $p<0.05$  as significant.

## Results

Amongst 147 patients, 90 (61.22%) were males. The age of the study population ranged from 30 to 60 years with a mean of  $27 \pm 14.52$  SD years. Ninety-two (62.58%) patients were under 30 years of age. Overall, 60 (40.81%) patients developed pruritic rash in the course of dengue fever.

The demographic parameters of the study population and frequency of pruritic rash amongst the study population are shown in Table 1. The stratification of frequency of pruritic rash according to different age groups and gender is shown in Table 2.

**Table 1: Demographic Parameters of Study Population (n=147)**

Parameter	No. (%)
<b>Gender</b>	
Male	90 (61.22%)
Female	57(38.77%)
<b>Age Groups</b>	
$\leq 30$ Years	92(62.58%)
$> 30$ Years	55(37.41%)
<b>Pruritic rash</b>	
Yes	60(40.81%)
No	87(59.18%)

**Table 2: Stratification of Pruritic Rash with Age and Gender (n=147)**

		Pruritic rash		<b>p value</b>
		Yes	No	
<b>Age</b>	$\leq 30$ Years (n=92)	38 (25.85%)	54 (36.73%)	0.876
	$> 30$ Years (n=55)	22 (14.96%)	33 (22.44%)	
<b>Gender</b>	Male (n=90)	20(13.60%)	70(47.61%)	<0.01
	Female (n=57)	40(27.21%)	17(11.56%)	

## Discussion

This study was conducted to determine the frequency of pruritic rash in patients with

dengue fever. Overall, the pruritic rash was seen in 60 patients (40.81%). Mallhi et al. have reported a comparable frequency (41.8%) of

rash in patients admitted to a tertiary care hospital in Malaysia for the management of dengue fever.<sup>6</sup> But other studies have reported lower frequencies (16% and 27.6%) frequencies of pruritic rash in patients with dengue fever.<sup>4,7</sup> The reasons for the variable frequency of rash in dengue fever patients may be in part due to genetic factors which may influence the way the disease manifest in different population. Similarly, different serotypes of the dengue virus have been shown to cause cutaneous manifestation with variable frequency.<sup>8</sup> This may also account for the discordant results among studies carried out in different regions.

As compared to males, a significantly higher proportion of female patients developed the pruritic rash. To the best of our knowledge, this gender-based difference has not been reported in the literature. The difference may have resulted from the under-representation of female patients in our sample. Moreover, the possibility that female sex hormones may have a role to influence the development of rash in patients with dengue fever cannot be excluded. Studies with a relatively large sample size and equivalent representation of males and females shall be carried out in endemic regions to put this hypothesis to test. Unlike gender, age did not influence the development of rash in this study.

The study has several limitations. First, the sample size was relatively small. Secondly, the study enrolled only those patients admitted to the hospital, and these patients had relatively severe and complicated infections than would be seen in dengue patients seen in the out-patient department. For these reasons, the results of the study cannot be generalized, and studies with a large and representative sample are recommended to better understand the cutaneous manifestation of dengue fever.

## CONCLUSION

A pruritic rash is one of the common manifestations of dengue fever. Females were more likely to develop the rash while there was no difference in the frequency of rash between different age groups. Because of a small sample of only admitted patients and under-representation of female patients, the results cannot be generalized.

## DECLARATIONS

### Authors contributions:

MMS and NS conceived the study, contributed to data analysis and manuscript writing. MI and SA contributed to data collection. FR

contributed to data analysis and manuscript writing. All authors reviewed the final manuscript for approval.

### Conflicts of Interests:

All authors have no conflict of interests to declare.

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## References

1. Huang H-W, Tseng H-C, Lee C-H, Chuang H-Y, Lin S-H. Clinical significance of skin rash in dengue fever: A focus on discomfort, complications, and disease outcome. *Asian Pac J Trop Med.* 2016 Jul;9(7):713–8.
2. Khan AH, Hayat AS, Masood N, Solangi NM, Shaikh TZ. Frequency and clinical presentation of dengue fever at tertiary care hospital of Hyderabad/Jamshoro. *J Liaquat Univ Med Heal Sci.* 2010;9(2):88–94.
3. Azfar NA, Malik LM, Jamil A, Jahangir M, Tirmizi N, Majid A, et al. Cutaneous manifestations in patients of dengue fever. *J Pakistan Assoc Dermatologists.* 2012;22(4):320–4.
4. Chadwick D, Arch B, Wilder-Smith A, Paton N. Distinguishing dengue fever from other infections on the basis of simple clinical and laboratory features: application of logistic regression analysis. *J Clin Virol Off Publ Pan Am Soc Clin Virol.* 2006 Feb;35(2):147–53.
5. Lee M-S, Hwang K-P, Chen T-C, Lu P-L, Chen T-P. Clinical characteristics of dengue and dengue hemorrhagic fever in a medical center of southern Taiwan during the 2002 epidemic. *J Microbiol Immunol Infect.* 2006 Apr;39(2):121–9.
6. Mallhi TH, Khan AH, Adnan AS, Sarriff A, Khan YH, Jummaat F. Clinico-laboratory spectrum of dengue viral infection and risk factors associated with dengue

hemorrhagic fever: a retrospective study. BMC Infect Dis. 2015;15(1):399. Available from: <https://doi.org/10.1186/s12879-015-1141-3>

7. Thomas EA, John M, Bhatia A. Cutaneous manifestations of dengue viral infection in Punjab (north India). Int J Dermatol. 2007 Jul;46(7):715–9.

8. Suppiah J, Ching S-M, Amin-Nordin S, Mat-Nor L-A, Ahmad-Najimudin N-A, Low GK-K, et al. Clinical manifestations of dengue in relation to dengue serotype and genotype in Malaysia: A retrospective observational study. PLoS Negl Trop Dis. 2018 Sep;12(9):e0006817.