

## Knowledge and Practices of General Practitioners Regarding Differentiation of Dengue Fever From Dengue Hemorrhagic Fever: A Cross-Sectional Survey

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### Abstract

**Objective:** To determine Knowledge and Practices of General Practitioners regarding differentiation of dengue hemorrhagic fever (severe dengue) from Dengue Fever.

**Material and Methods:** A cross sectional study was conducted in Lahore city from June 2023 to August 2023. Using convenient purposive sampling technique, 370 general practitioners (GPs) of Lahore city were selected and questioned about how they differentiated DF from DHF. Responses about clinical signs (right sided upper abdominal tenderness, increased capillary refill time, narrow pulse pressure, tachycardia), evidence of fluid leak on ultrasonography of abdomen and worsening hematological parameters on serial complete blood count CBCs (decreasing platelets <50000, leukopenia and raised hematocrit) were recorded in structured questionnaire. Data was entered and analyzed using SPSS 20.

**Results:** 308(83%) were males and 62 (16%) were females with mean experience  $16.74 \pm 7.65$  years. 56.4% responded that they checked right sided upper abdominal tenderness to identify DHF, 41% mentioned used of tachycardia, 23% increased capillary refill time, 27% mentioned narrow pulse, 112/370 (30%) said Ultrasound abdomen and chest to check of fluid leak and thickening of gall bladder wall, 84% mentioned serial CBCs to look for worsening thrombocytopenia, 67% used worsening leukopenia and 67% used increasing hematocrit as sign of DHF.

**Conclusions:** Majority of general practitioners of Lahore city lacked necessary practices regarding identification of severe dengue fever. It is recommended that health authorities must take concrete steps to ensure dissemination of standard protocols and guidelines as well as continuous medical education and capacity building for health care workers.

**Keywords:** diagnosis of severe dengue/DHF/DSS, general practitioners, Lahore city

**How to cite:** Zaidi SRH, Haider SH, Bokhari M, Manssora R, Iqbal MS, Naqvi AF. Knowledge and Practices of General Practitioners Regarding Differentiation of Dengue Fever From Dengue Hemorrhagic Fever: A Cross-Sectional Survey. *Esculapio - JSIMS* 2023;20(01):109-113.

**DOI:** <https://doi.org/10.51273/esc24.251320121>

### Introduction

Dengue fever is one of the viral disease caused by bite of mosquito characterized by rapid spread.<sup>1</sup>

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Submission Date: 22-11-2023

1st Revision Date: 14-01-2024

Acceptance Date: 12-03-2024

The World Health Organization (WHO) has ranked dengue as one of the top ten threats to Global health in 2019, and estimates a 3.9 billion prevalence of people, accounting to 40%-50% of the world's population being at risk of infection. 128 countries worldwide are at risk of dengue infection, of which 70% of the global burden being in Asia.<sup>1</sup> The reported dengue cases to WHO increased from < 0.5 million in 2000 to > 3.34 million in 2016, characterized by a worldwide outbreak. Although the world-wide numbers declined in 2017, there was a significant rise again in 2019 with 4.3 million cases worldwide.<sup>1</sup>

A dengue epidemic occurred in Karachi In 2006.<sup>2</sup> In Punjab province, in year 2003, 2006 and 2007 cases of dengue were also reported.<sup>2</sup> However Lahore city was hit by dengue epidemics in 2008 and 2010.<sup>2</sup> Dengue has become endemic in Pakistan like Chikungunya virus (CHIKV), West Nile virus (WNV), and Japanese encephalitis virus (JEV) and pose significant diagnostic difficulties due to multiple reasons.<sup>3,4</sup> However, recently DENV antigen, IgM and IgG antibodies can be detected by some assays that are commercially available.<sup>5-8</sup>

Proper case management is a key issue in dealing with infectious disease outbreak in order to curtail morbidity and mortality. As much of the mortality caused by dengue is due to dengue Hemorrhagic fever (DHF). If the diagnosis gets delayed and patients are not managed accordingly detrimental consequences can occur. Therefore, its crucial that DHF may be identified early and managed accordingly. WHO classified the more serious dengue illness as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) in guidelines published in 1997.<sup>9</sup> However, WHO in 2009 reclassified it as Dengue and Severe dengue.<sup>9</sup> Raise in hematocrit levels bleeding, pleural effusion, thrombocytopenia with  $<100,000$  platelets/ $\mu\text{L}$ , abdominal pain, restlessness, sudden drop in temperature and vomiting, are the manifestations of severe dengue.<sup>9</sup> Plasma leakage couldn't be detected in early phase of severe disease through who guidelines of 1997 and 2009. Various researchers from across the world explored potential early phase clinical, laboratory and radiological markers of severe dengue. Nainggolan et al identified that gallbladder wall thickening on ultrasonography can be sign of detect plasma leakage in earlier phase.<sup>10</sup> Role of ultrasonography in dengue was also documented by a report from Indonesia.<sup>11</sup> Significant association of four parameters with DSS, hypoalbuminemia, hemoglobin concentration, thrombocytopenia and elevated AST level, were reported in A meta-analysis.<sup>12,13</sup> Srisuphanunt found that hematocrit ( $>40\%$ ), age ( $>17$  years), anorexia, neutrophils ( $\leq 51\%$ ), atypical lymphocyte ( $>3\%$ ), platelet count ( $\leq 97 \times 10^3/\mu\text{L}$ ), PT ( $>13.1$  s), albumin ( $\leq 2.7$  g/dL), PTT ( $>28.5$  s), ALT ( $>141$  U/I) AST ( $>104$  U/I), predicted severity.<sup>14</sup>

Ibrar, et al, reported from Karachi, that half of the general practitioner didn't know that for diagnosing probable dengue, leucopenia can be used, 140 (35%) did not know warning signs and criteria for diagnosis of severe dengue. 136(34%) were not aware of abdominal pain and persistent vomiting as warning signs.<sup>15</sup> Khan et al, also reported lack of knowledge of physicians about certain

topics about dengue in hit list cities. Questions regarding dengue, symptoms vaccines, medication not be given to dengue fever or shock patients were answered as "Do Not Know" by the physicians of a selected hospital. Criteria for diagnosing Dengue Hemorrhagic Fever was known by 44.5% only.<sup>16</sup> General practitioners retain an important position in the hierarchy of health care providers as far as this disease is concerned. They are the first contact by the majority of patients for management of any illness. So the way they manage dengue fever in community can architect the fate of epidemic in terms of morbidity and mortality. In the light of above mentioned facts the study was carried out to appraise Knowledge and Practices of General Practitioners regarding differentiation of Dengue Fever from dengue hemorrhagic signs to highlight discrepancies in the current management practices and to guide the policy makers for introduction and improvement of standardized management protocol and continuous capacity building of Health Care workers.

## Material and Method

A descriptive cross sectional study was conducted in Lahore city for three months duration. Convenient purposive sampling technique was used to select study participants, which were general practitioners (GP) of Lahore city. 370 GPs were questioned about how they differentiated DF from DHF and based upon the responses questionnaire was filled and relative answers were recorded in structured questionnaire. Responses about clinical signs (right sided upper abdominal tenderness, increased capillary refill time, narrow pulse pressure, tachycardia), evidence of fluid leak on ultrasonography of abdomen and worsening hematological parameters on serial complete blood count CBCs (decreasing platelets  $<50000$ , leukopenia and raised hematocrit) were recorded. Data was entered and analyzed in SPSS 20. Means and standard deviations were calculated for continuous variables like age and experience, proportions and percentages were calculated for categorical variables.

## Results

Study included general practitioners out of which 308 (83%) were males and 62 (16%) were females. General Practitioners had mean age of 41.6 years with standard deviation of 7.5 years. General Practitioners had experience 16.74 years of with standard deviation of 7.65 years. The results of this study shows that amongst

those GPs who participated in the study 165 (44%) did post-graduation studies while 202(55%) did not do any post-graduation study. This study included 158(42%) GPs who were concurrently working in some tertiary care hospitals 213 (57%) GPs were not working in any such settings. 212(61.1%) of the GPs who participated in the study have attended some sort of course or seminar regarding clinical management of dengue fever. While 135 (38.9%) had not attended any course on dengue fever management. While 23 (6.9%) GPs did not answer this question. (Table 1). 209/370 (56.4%) responded that they checked right sided upper abdominal tenderness to identify DHF, 154/370 (41%) mentioned used of tachycardia as signs of DHF, 87/370 (23%) used increased capillary refill time, 102/370 (27%) mentioned narrow pulse pressure to identify DHF. Only 112/370 (30%) said that they advise Ultrasound abdomen and chest to check of fluid leak and thickening of gall bladder

wall as sign of DHF. However a vast majority 311/370(84%) mentioned serial CBCs to look for worsening thrombocytopenia as sign of DHF, 248/370 (67%) used worsening leukopenia as sign of DHF and 284/370 (67%) used increasing hematocrit as sign of DHF. (Table 2)

### Discussion

While hyper endemicity dengue fever is becoming more evident, it is of paramount importance that severe dengue may be identified as early as possible to treat high risk patients accordingly. General practitioners are usually first level of health care providers, so if they identify, manage and refer severe dengue in earlier stage of disease, morbidity and mortality can be further reduced. Results of the study show that a vast majority of general practitioners are missing many important clinical/ laboratory and radiological parameters to identify the severe form of dengue which is both unfortunate and alarming. 56% responded that they checked right sided upper abdominal tenderness to identify DHF which shows that a large majority was missing on this pathognomonic sign of severe dengue. 41% mentioned used of tachycardia as signs of DHF. Again this sign is very important and less than half of the sample GPs used it to identify the disease. Similar is the case with 23% used increased capillary refill time, similar is the case with 27% mentioned narrow pulse pressure where a big proportion missed out on this clinical parameter. Only 30% said that they advise Ultrasound abdomen and chest to check of fluid leak and thickening of gall bladder wall as sign of DHF. However a vast majority 84% mentioned serial CBCs to look for worsening thrombocytopenia as sign of DHF, 67% used worsening leukopenia as sign of DHF and 67% used increasing hematocrit as sign of DHF. GPs were identifying severe dengue more through CBCs parameters (67%-84%) than through clinical signs (23%-56%) and USG abdomen(30%). However, high deficiency in adequate practices is noted in this study. Our results are unanimous with the finding of Ibrar 27 and Khan 28, who also identified lack of correct practices and knowledge in doctors managing dengue fever and reported from 35-44% doctors were unaware of diagnosing criteria and clinical parameters of severe dengue fever or dengue haemorrhagic fever. Moreover it is noteworthy that these studies were conducted in physicians working in tertiary care hospitals who have more chances to update their knowledge through workplace interaction with colleagues and seniors consultants, seminars/symposia and workshops being held in such

**Table 1:** Characteristics of Study Participants (n=370)

Gender	Male	308(83%)
	Female	62 (16%)
Postgraduation study after basic medical qualification	Yes	165(44%)
	No	202(55%)
Concurrently working in tertiary care hospital	Yes	213 (57%)
	no	212(61.1%)
Attended some course/ training/seminar regarding clinical management of dengue fever.	yes	212(61.1%)
	No	135(38.9%)
	Did not answer	23 (6.9%)

**Table 2:** Practices of assessing of clinical/ laboratory/ radiological parameters for identification of severe dengue fever.(n=370)

	Yes	209 (56.4%)
	Right sided upper abdominal tenderness	No
Tachycardia	yes	154 (41%)
	no	216(58%)
Increased capillary refill time	yes	87(23%)
	no	283(76%)
Narrow pulse pressure	yes	102(27%)
	no	268(72%)
USG abdomen and chest for fluid leakage and gall bladder wall edema	yes	112(30%)
	no	258(69%)
Worsening thrombocytopenia on serial CBCs	yes	311(84%)
	no	59(15%)
Worsening leukopenia on serial CBCs	yes	248(67%)
	no	122(32%)
Increasing heamatocrit on serial CBCs	yes	248(67%)
	no	122(32%)

setups, and access to disease management guideline/ SOPs made available by such organization. While a general practitioner who is not working in tertiary care hospital, has much lower such chances to upgrade his knowledge regarding management practices of various diseases. This alarming situation calls for the dissemination of standard protocols and guidelines as well as continuous medical education in context of dengue fever management of general practitioners through workshops, lectures, symposia so as to ensure the capacity building for workforce to deal this menace.

## Conclusion

A vast majority of general practitioners of Lahore city lacked relevant practices regarding identification of severe dengue fever. This, it is imperative that capacity building of general practitioners must be ensured via workshops or symposia. It is recommended that health authorities must take concrete steps in this context and ensure capacity building for health care workers of community.

**Conflict of interest:** *None*

**Funding source:** *None*

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### **Authors Contribution**

**SRHZ:** Conceptualization of Project

**SHH:** Data Collection

**MB:** Literature Search

**RM:** Statistical Analysis

**MSI:** Drafting, Revision

**AFN:** Writing of Manuscript