

Specificity of Hess Test as a Marker of DHF

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Abstract

Objectives: Dengue Fever is a public problem in most of the tropical countries of South – East Asia. DHF is a serious form of Dengue Infection, diagnosed on the basis of demonstrating an increased capillary permeability and thrombocytopenia with concurrent haemo-concentration. Hess test or Tourniquet test has been recommended as the initial screening procedure of patients with suspected DHF. The objective of the present study was to see the specificity of Hess test as a marker of DHF.

Methods: In a total of 50 patients of DHF admitted to the Mayo hospital Lahore from September to October 2011 during outbreak of Dengue Infection, were prospectively studied. Hess test or tourniquet test was conducted in these cases in the standard method.

Results: Out of the 50 patients of DHF, only 26 were Hess test positive. These 50 patients were divided into

4 groups, patients with only rash, only bleeding, bleeding and rash together and Non-bleeding Non-rash. Out of 09 patients of rash Hess test was positive in only 06 patients (67.7%). In bleeding only group Hess test was positive in 06 out of 11 patients (54.5%). Similarly in bleeding n rash simultaneously Hess test was positive in 06 out of 07 patients (85.7%). In non bleeding non rash group Hess test was positive in 08 out of 23 patients (34.8%).

Conclusion: The tourniquet test was positive in only 52% of all DHF cases. It is concluded that a positive Hess test is a good marker of DHF but negative tourniquet test may not be sufficient to exclude a diagnosis of DHF in a febrile patient. This necessitates the need for the re-defining the clinical criteria for the diagnosis of DHF, particularly grade I DHF.

Introduction

Dengue infection is one of the most important public health problems in the tropical and subtropical countries¹ caused by mosquito borne single stranded, RNA positive flavivirus which has 4 serotypes DEN₁₋₄.² It results in various dengue illnesses, from mild undifferentiated febrile illness to classical dengue fever (DF) to the life – threatening dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).³

About two – thirds of the world's population lives in areas infested with dengue vectors, mainly *Aedes aegypti* and 80 million persons become infected annually. Currently, dengue is endemic in all continents except Europe and epidemic dengue haemorrhagic fever (DHF) occurs in Asia, America and some Pacific

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Incidence of DHF is much greater in the Asian countries than in other regions. South – East Asia particularly Viet Nam and Thailand together accounted for more than two – thirds of the DHF cases in 1990. However, an increase in the number of reported cases has been noted in the Philippines, Lao People’s Democratic Republic, Cambodia, Myanmar, Malaysia, India, Singapore and Sri Lanka during the period 1991–1995 as compared to the preceding 5 – year period.⁵

In Pakistan, the first confirmed outbreak was due to serotype DV₂ reported in 1994 by Aga Khan University Hospital (AKUH).⁶ Paul et al reported in 1998 that an outbreak of dengue fever in the Baluchistan province was due to co-circulation of DV₁ and DV₂.⁷ During September to December 2005 Genotyping of selected samples from three major hospitals in Karachi, early part of the outbreak revealed the presence of DV₃.⁸ Thereafter, Pakistan experienced its largest and most severe outbreak of DHF in 2006 and 2011 and DV₂ and DV₃ were identified as the predominant serotypes.⁹

The clinical features of DHF include fever, rash, plasma leakage, thrombocytopenia, bleeding tendency and liver involvement. The hallmark that distinguishes DHF from DF is plasma leakage as a result of increased vascular permeability.¹⁰

The Standard tourniquet test is performed in critical phase of the illness which reflects both capillary fragility and thrombocytopenia. In this test standard blood pressure cuff is inflated at 80 mmHg for 5 minutes. If more than 10 patichae are noted in 1inch square area at cubital fossa, test is termed positive. In WHO 1997 guidelines it was used in the diagnosis of DHF and DSS but not for DF.¹¹ However, in the revised WHO 2009 guidelines, the tourniquet test is listed as a diagnostic criterion for DF, DHF and DSS.¹² However, an evaluation of the tourniquet test in the diagnosis of dengue infection among Vietnamese children suggested that it added little diagnostic utility in hospitalized children with low sensitivity (42%) but high specificity (94%).¹³ In contrast, among Malaysian children, the tourniquet test had fairly good sensitivity (83%) but very low specificity (23.5%).¹⁴ Therefore, we performed a prospective study to see the specificity of Hess test in DHF.

Material and Methods

In a total of 50 patients with high grade fever, bleeding, rashes and low platelet count, admitted to the Mayo

hospital Lahore during 2 months time from September to October 2011 were included in this perspective cross sectional study. The diagnosis of dengue hemorrhagic fever was made on the basis of initial assessment of pulse, BP, fever, thrombocytopenia, haemoconcentration > 20% from the baseline, plasma leakage and bleeding. Clinical diagnosis was supported by FBC, ultrasound abdomen and pelvis and x-ray chest.

Hess test or tourniquet test was performed by inflating blood pressure cuff to 80 mmHg for 5 minutes. More than 10 patichae at 1 inch square area at cubital fossa were taken as positive test.

Results

Table 1: Total Hess Test Positive and Negative DHF Patients.

Hess Test	Total Patients		
	Males	Females	Total
Positive	14	12	26
Negative	08	16	24
Total Patients	22	28	50

Table 2: Hess Test in DHF Rash Only Patients.

Rash Only	Total Patients		
	Males	Females	Total
Positive	04	02	06
Negative	01	02	03
Total Patients	05	04	09

Table 3: Hess Test in DHF Bleeding Only Patients.

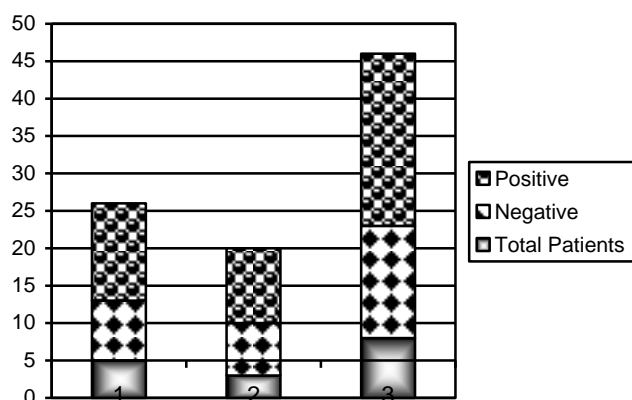
Bleeding Only	Total Patients		
	Males	Females	Total
Positive	02	04	06
Negative	01	04	05
Total Patients	03	08	11

Table 4: Hess Test in DHF Bleeding plus Rash Patients.

Bleeding + Rash	Total Patients		
	Males	Females	Total
Positive	04	02	06
Negative	00	01	01
Total Patients	04	03	07

Table 5: Hess Test in DHF Non-Bleeding and Non-Rash Patients.

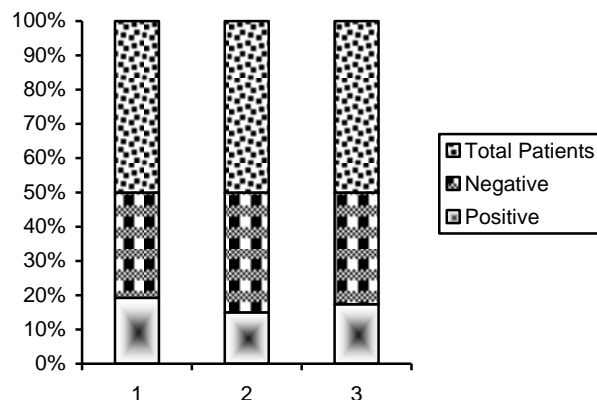
Non-Bleeding + Non-Rash	Total Patients		
	Males	Females	Total
Positive	05	03	08
Negative	08	07	15
Total Patients	13	10	23



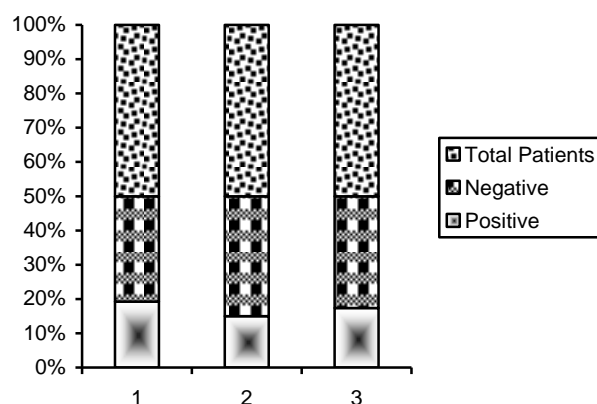
Graph 1: Total Hess Test Positive and Negative DHF Patients.

Discussion

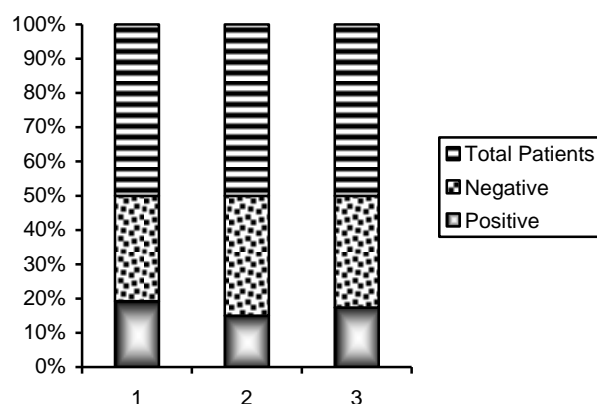
This study suggests that the standard tourniquet test has diagnostic value for the diagnosis of dengue infection, with low sensitivity but good specificity. Out of the 50 patients of DHF, only 26 showed Hess test positivity. These 50 patients were divided into 4 groups' patients with only rash, only bleeding, bleeding and rash together and Non-bleeding Non-rash. Out of 09 patients of rash Hess test was positive in only 06 patients (67.7%). In bleeding only group Hess test was positive in 06 out of 11 patients (54.5%). Similarly in bleeding n rash simultaneously Hess test was positive



Graph 2: Hess Test in DHF Rash Only Patients.



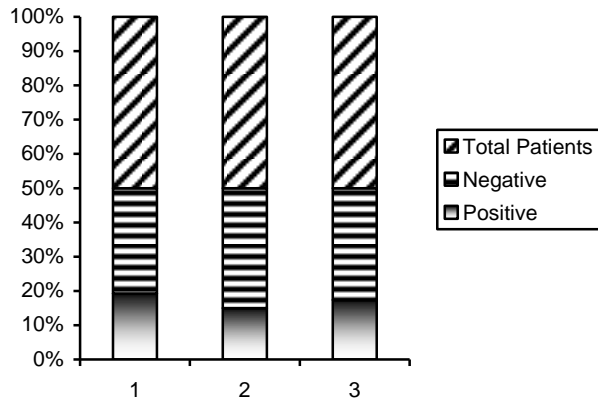
Graph 3: Hess Test in DHF Rash Only Patients.



Graph 4: Hess Test in DHF Bleeding Plus Patients.

in 06 out of 07 patients (85.7%). In non-bleeding non-rash group Hess test was positive in 08 out of 23 pati-

ents (34.8%). In the 1997 World Health Organization guidelines for dengue diagnosis, the tourniquet test is one of the criteria for the diagnosis of DHF but not for DF, and in this study 43.47% of patients had positive tourniquet tests, while 56.53% of patients with DHF had negative tourniquet tests.



Graph 5: Hess Test in DHF Non-Bleeding and Non-Plus Patients.

Conclusion

The tourniquet test was positive in only 52% of all DHF cases. It is concluded that tourniquet test is a good prognostic marker but a negative tourniquet test may not be sufficient to exclude a diagnosis of DHF in a febrile patient. This necessitates the need for the re-defining the clinical criteria for the diagnosis of DHF, particularly grade I DHF.

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