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DENGUE FEVER;

AN AUDIT OF RISK FACTORS AMONG PATIENTS REPORTING AT A TERTIARY CARE HOSPITAL IN HYDERABAD

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ABSTRACT… Background: Dengue fever & its complications have become a nightmare for common people in Asian countries including Pakistan. Besides environmental factors responsible for its transmission, there are many host factors too involved in its rapid spread. **Objective:** To assess risk factors for dengue fever among patients reporting at Liaquat University Hospital (LUH) Hyderabad. **Study Design, Setting & Study duration:** Descriptive cross sectional study was conducted at LUH, Hyderabad for six months i.e. from 15th May 2013 to 15th November 2013. **Methods:** 481 patients were registered through convenient sampling after informed verbal consent. Patients' demographic features, clinical presentations & laboratory reports were collected on a preformed proforma. **Results:** The reporting rate for dengue fever was 18.5% & the mean age of presentation was 28.5 ± 3.5 years. Males were in majority (72.55%) & the average days of admission were 4.5 days; low platelets count (< 50,000/mm^3) was recorded in 72% of cases; however 11.64% patients presented with hemorrhagic tendency. Age was strongly associated with thrombocytopenia (p=0.04) & with occurrence of hemorrhage (p=0.03) in both genders; this association was more evident among males (p=0.01). However among uncomplicated cases no association was evident between gender & length of stay in (p=0.35). **Conclusions:** The alarmingly higher reporting rate of dengue fever necessitates contextual preventive interventions. As younger age & male gender are the major risk factors for this disease; therefore age-specific & gender-specific preventive strategies against this disease are recommended.

Key words: Dengue fever, risk factors, age, gender, hemorrhagic tendency.

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INTRODUCTION

Dengue fever is a systemic arthropod borne viral infection transmitted by Aedes aegyptii mosquitoes[1]. Asia is among the highest risk zones for its transmission[2]. Its global burden in future is estimated to parallel that of malaria and tuberculosis & it will impose grave economic challenges for communities and governments[3]. A large number of dengue fever outbreaks have been experienced in Pakistan since 1992 & it has become a cyclical nightmare in Pakistan over the last several years. Although knowledge about the geographical distribution of diseases is central to the planning, implementation, and monitoring of control programs, but it is equally important to know the reasons for variation of its clinical presentation among various groups of population. Evidence suggests that risk for disease, with both classic dengue fever and dengue hemorrhagic fever varies by age, gender & other socio-demographic attributes of the population[4]. A clearer understanding of host-disease relationship has implications for strategies aimed at controlling dengue fever. The objective of this study was to determine risk factors for dengue fever among patients reporting at a tertiary care hospital. The current study will help in future to design and employ effective preventive and control strategies against the disease employing a targeted approach.

MATERIAL & METHOD

Design & Place of Study
It was a descriptive cross sectional study conducted on patients reporting in medical & pediatrics wards & outpatient department of Liaquat University Hospital (LUH) Hyderabad.

Duration of Study
Six months i.e. from 15th May 2013 to 15th November 2013.

Sample Size & Sampling Technique
Four hundred & eighty one patients were registered for the study, selected by convenient sampling.

Data Collection Method & Data Analysis
A uniform questionnaire was designed to collect the data of the patients reporting at medical OPD & wards of LUH for the specified study, after taking informed consent from the patients. The questionnaire consisted of demographic details of the suspected dengue patients & their laboratory reports. Dengue virus rapid diagnostic tests were set as confirmatory criteria & immunoglobulins i.e. IgM & IgG levels & platelet counts were recorded.

Inclusion & Exclusion Criteria
All patients reporting with symptoms suggestive of dengue fever were primarily registered for study. The patients, who remained under surveillance till confirmation of diagnosis, were included in study. Those who reported for some other disease & were concomitantly diagnosed as cases of dengue fever were also included in study. Those who were unwilling did not give consent, left before confirmation of diagnosis were dropped from study. The variables of interest were age, gender, sero-positivity for dengue fever, occurrence of hemorrhage, platelet count, length of stay of patients & outcome of disease. The frequencies for all variables were computed. The categorical data was analyzed by applying Chi-square test of significance; the means & standard deviation were calculated for continuous variables & they were analyzed by applying student's t-test of significance. The p-value of = 0.05 was taken as the level of significance.

RESULTS
Total four hundred & eighty one patients were diagnosed as dengue fever. Prevalence of dengue fever among admitted patients was 18.5%. All presented with complaint of fever (100%) with varying degrees of other complaints like malaise, vomiting & bleeding tendency. The minimum age recorded was 4 years & maximum age was 78 years; fifty six patients (11.64%) presented with hemorrhagic tendency (Fig-1 & 2).

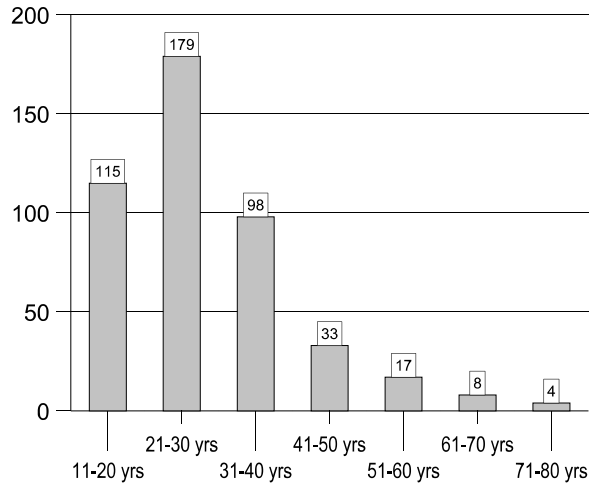

Fig-1. Age wise distribution of patients of dengue fever

The mean age of presentation was 28.5 years with standard deviation of ± 3.5 years. Among them males were 349 (72.55%) & females 132 (27.45%) (Fig-3). There were 314 (65.29%) in-patients while 154 (32.01%) didn't need admission & were dealt in out-patient department; while 13 (2.70%) patients left against medical advice. The average days of admission were 4.5 days; low platelets count (< 50,000/mm^3) was recorded in 72% of cases. Seropositivity for IgM was seen in 449 (93.34%) & IgG was +ve in 92(19.13%) patients.

There was statistically significant association between age of patients & low platelet counts (p=0.04); while gender stratification & low platelet count did not show such association (p= 0.87);

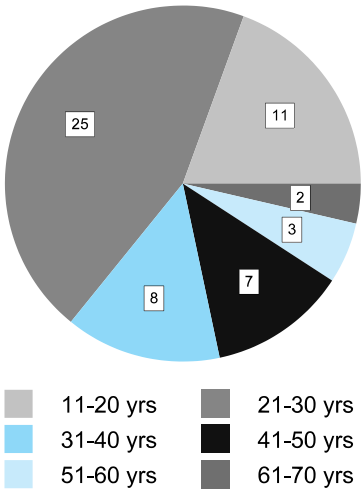

Fig-2. Age wise distribution of dengue hemorrhage fever patients

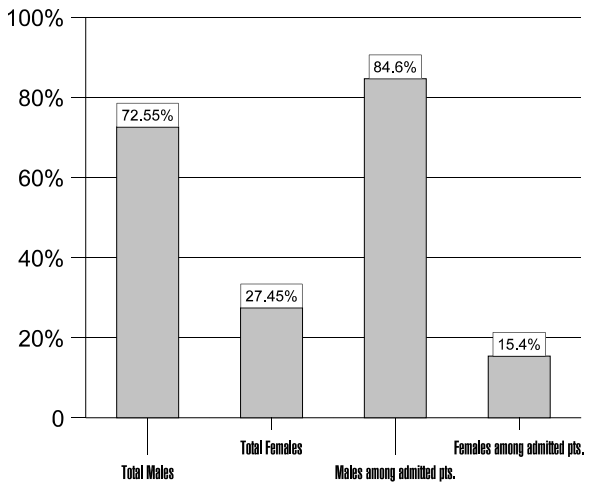

Fig-3. Gender wise distribution of total admitted cases

low platelet counts were associated with hemorrhage (p=0.03) in both genders but this association was more evident among males (p=0.01). Hemorrhagic tendencies affected the length of stay of patients in medical wards (p=0.02). There was however no significant difference between gender & length of stay in uncomplicated cases (p=0.35).

DISCUSSION

Among patients presenting with history of fever examined in medical & pediatrics wards during the study period of six months, the reporting rate of dengue fever was 18.5%. A study conducted in Rawalpindi & Islamabad revealed reporting rate as 13.6% of the total admissions[5]. A study with similar objectives in Khyber Pakhtoon Khuwa revealed reported seroprevalence of dengue as 31.68 percent[6]. The reason for higher reporting rates in this study could be because data was collected from catchment population of primary & secondary health care centers & the period of data collection was August-October i.e. the peak season for dengue fever. Moreover majority of the patients were the admitted cases. Contrasting to it, in our study there were 314 (65.29%) admitted cases against 154 (32.01%) OPD cases; the average days of admission were 4.5 days. The mean age of patients diagnosed as dengue fever in the current study was 28.5 years & the age-range was recorded as 4-78 years. In a study conducted during the dengue epidemic in Lahore, the mean age of the subjects was 34±16.5 years with a range of 5–80 years[7]. A study in Malaysia found majority of the reported cases being older than 15 years of age making up to 40% of total cases during 2001–2005[8]. According to a study in Brazil, the risk of dengue fevers was seen to increase with advancing age[9]. In many parts of the world, dengue infection is predominantly a childhood disease; however, it affects adult population primarily during first few years of its emergence. Results of current study also confirmed this notion. Adults aged 30 and above showed higher IgG positivity. An upward trend with increasing age was also recorded by Mahmood S et al in Lahore, too[10]. Highest number of cases was registered in age group of 25-35 years in our study. Age was observed as significantly associated with low platelet counts (p=0.04). A study by Joseph R logically described a clear positive relationship between age and relative risk for clinical dengue fever & its complications[11]. Vaughn DW also endorsed our finding[12]. However still a question remained unanswered whether all age groups in the study population had equal access to participating health facilities or not. However, if a

reporting bias were introduced, it would likely be in adults because of child-rearing duties and difficulty taking time off from work. Moreover, further research is recommended to determine relationship between age and classic dengue fever.

Regarding gender distribution of patients the current study found male preponderance i.e. 72.55% males against 27.45% females. Some of the researchers in Asian countries like in Singapore & India have also evidenced similar gender distribution regarding incidence of dengue fever[13]. In a study in Lahore, the 73% of those affected were males[7]. According to a study by Montenegro there was a predominance of male gender among patients who died of dengue fever[14]. Contrasting to this, Duncombe et el found almost equal seroprevalence of dengue fever among males and females[15]. In Malaysia, the majority of reported cases were consistently male more than expected with an overall 62 percent[8]. The males' dominance in reported cases in current study could be due to their more outdoor exposure to transmitting agent or their overall high reporting rates to the health facilities. Yew et al. also suggested male-female differences in the use of health services accounting for this discrepancy[16]. Differences in dengue incidence have been attributed to gender-related differences in exposures such as time away from home[17]. As a matter of fact, as the gender related disease rates vary according to age therefore it is important to examine dengue cases by both sex and age. The same was also emphasized by Lin C et al[18]. The age-sex incident model will help in formulating more concrete preventive strategies. Our study revealed low platelet counts associated with hemorrhage ($p=0.03$) in both genders but this association was highly significant among males ($p=0.01$). Contrasting to this, another study conducted in Aga Khan Hospital Karachi although revealed male preponderance in occurrence of dengue hemorrhagic fever but gender didn't showed statistical significance ($p=0.07$)[19]. Some other studies however endorsed our findings[20,21]. Thrombocytopenia (<100,000 platelets/μL) was one of the most common haematological abnormality, observed in 67.58 % of the cases of dengue fever in Saudi Arabia[22]. Another point highlighted in current study was that hemorrhagic tendencies affected the length of stay of patients in medical wards ($p=0.02$). The same was found by Humayoun M et al too[23]. It was in contrast to non-significant difference between gender & length of stay in uncomplicated cases ($p=0.35$). It might be due to the viral nature of the disease that is self limiting. The same was the finding by Jamil, B et al[24] & Salahuddin N, too[25].

CONCLUSIONS & RECOMMENDATIONS

The current study found a consistent pattern of young age & male predominance in the reported incident cases of dengue fever & dengue hemorrhagic fever. Since collapsing the data over all ages & gender would have masked some of the observed differences, these findings indicate the importance of reporting and age & gender-stratified data for dengue surveillance. This may be utilized in future in making age-specific & gender-specific control strategies against dengue fever.

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REFERENCES

1. Freifeld, C. C., Mandl, K. D., Reis, B. Y. & Brownstein, J. S. HealthMap: **Global infectious disease monitoring through automated classification and visualization of internet media reports.** J. Am. Med. Inform. Assoc. 15, 150-157, (2008).

2. Bhatt S, Gething PW, Oliver J, Bradyl, Jane P. Messina L, Farlow AW, Catherine L. Moyes B, Drake J, Brownstein JS, Hoen A, Sankoh O, Myers M, George B, Thomas Jaenisch, G. R.William W, Cameron P, Thomas W, Farrar J & Hay S. **The global distribution and burden of dengue.** doi:10.1038/nature12060.

3. Jahan F. **Dengue fever in Pakistan.** Asia Pac Fam Med 2011;10:1. doi: 10.1186/1447-056X-10-1.

4. Halstead SB. **Epidemiology of dengue and dengue hemorrhagic fever.** In: Gubler D, Kuno G, editors. Dengue and dengue hemorrhagic fever. Wallingford (UK): CAB International; 1997. p. 23–44.

5. Afraz N, Amber S, Irfan A, Atif G. **Prevalence of dengue fever in Rawalpindi & Islamabad- A cross sectional study.** www.medforum.pk/index.php.

6. Ali A, Rehman H, Nisar M, Rafique S, Ali S, Hussain A, Idrees M, Sabri S, Hakeem Zada A & Hussain S. **Seroepidemiology of dengue fever in Khyber Pakhtunkhwa, Pakistan.** International Journal of Infectious Diseases. 17 (7), July 2013:518–23.

7. Mukhtar F, Salim M, Farooq A. **Outbreak of dengue fever in Lahore: Study of risk factors.** J Ayub Med Coll Abbottabad 2012; 24(2).

8. Anker M & ArimaY. **Male-female differences in the number of reported incident dengue fever cases in six Asian countries. Regional Analysis. Emerging Diseases Surveillance and Response, Division of Health Security and Emergencies, World Health Organization Regional Office for the Western Pacific Western Pacific Surveillance and Response Journal.** World Health Organization.

9. Braga C, Luna CF, Martelli CM, De Souza WV, Cordeiro MT, Alexender N, et al. **Seroprevalence and risk factors for dengue infection in socio-economically distinct areas of Recife, Brazil.** Acta Trop 2010; 113:234–0.

10. Mahmood S, Nabeel H, Hafeez S, Zahra U & Nazeer H. **Seroprevalence of dengue IgG antibodies among healthy adult population in Lahore, Pakistan,"** ISRN Tropical Medicine, vol3(2). 2013. doi:10.1155/2013/521396.

11. Joseph R & Paul G. **Age and clinical dengue illness.** Emerg Infect Dis. 2007 June; 13(6): 924–927.

12. Vaughn DW, Green S, Kalayanarooj S, Innis BL, Nimmannitya S, Suntayakorn S, et al. **Dengue viremia titer, antibody response pattern, and virus serotype correlate with disease severity.** J Infect Dis 2000;181:2–9.10.1086/315215.

13. Eong OE. **Changing pattern of dengue transmission in Singapore.** Dengue Bulletin, 2001, 25:40–44. Available from: http://www.searo.who.int/ /Dengue_Bulletin _Volume_25_ch7.pdf [accessed 6 June 2011].

14. Montenegro D, Lacerda HR, Lira TM, Oliveira DS, Lima AA, Guimarães MJ, et al. **Clinical and epidemiological aspects of the dengue epidemic in Recife, PE, 2002.** Rev Soc Bras Med Trop 2006,39:9–13.

15. Duncombe J, Lau C, Weinstein P, Aaskov J, Rourke M, Grant R, et al. **Seroprevalence of dengue in American Samoa, 2010.** Emerg Infect Dis 2013;19:324–6.

16. Yew YW, Ye T, Ang LW, Ng LC, Yap G, James L, Chew SK, Goh KT. **Seroepidemiology of dengue virus infection among adults in Singapore.** Annals of the Academy of Medicine, Singapore, 2009, 38:667–275. pmid:19736569.

17. Kaplan JE. **Epidemiologic investigations of dengue infection in Mexico, 1980.** American Journal of Epidemiology, 1983, 117:335–343.pmid:6829561.

18. Lin C. **Characteristic of dengue disease in Taiwan: 2002–2007.** American Journal of Tropical Medicine and Hygiene, 2010, 82(4):731–739. doi:10.4269/ajtmh.2010.09-0549 pmcid:2023 8527.

19. Khan E , Kisat M, Khan N, Nasir A, Ayub S & Rumina Hasan. **Demographic and clinical features of dengue fever in Pakistan from 2003–2007: A retrospective cross-sectional study.** PLoS One. 2010; 5(9): e12505. www.ncbi.nlm.nih.gov › Journal List › PLoS One › vol:5(9); 2010.

20. Ahsan T. **Dengue fever: A regular epidemic?** J Pak Med Assoc 2008; 58: 1-2.

21. Akram DS, Ahmed S. **Dengue Fever.** Infect Dis J 2005; 14: 124-5.

22. Ahmed M. **Clinical profile of dengue fever infection in King Abdul Aziz University Hospital Saudi Arabia.** J Infect Dev Ctries 2010; 4(8):503-510.

23. Humayoun M, Waseem A, Jawa M & Akram J. 2010. **Multiple dengue serotypes and high frequency of dengue hemorrhagic fever at two tertiary care hospitals in Lahore during the 2008 dengue virus outbreak in Punjab, Pakistan.** International Journal of Infectious Diseases, vol:145, p:54-59.

24. Jamil B, Hasan A, Zafar K, Bewley J,ChamberlainV, Mioulet M. & Hewson R. **Dengue virus serotype 3, Karachi, Pakistan.** Emergency Infectious Diseases, 2007; vol. 13(1), p:182-183.

25. Salahuddin, N, Ali F, Ali M & Rashid F. **Dengue fever outbreak in Karachi, 2005-A Clinical Experience.** Infect Disease Journal, Vol. 14, No. 4, pp. 115-117.

PREVIOUS RELATED STUDY

Irfan Arshad, Fayyaz Ahmed Malik, Aamir Hussian, Shahida A.R. Shah. DENGUE FEVER; CLINICO-PATHOLOGIC CORRELATIONS AND THEIR ASSOCIATION WITH POOR OUTCOME (Original) Prof Med Jour 18(1) 57-63 Jan, Feb, Mar 2011.