DENGUE FEVER;

ULTRASONOGRAPHY OF DENGUE FEVER PATIENTS IN PAEDIATRIC AGE GROUP "A DESCRIPTIVE STUDY AT A TERTIARY CARE HOSPITAL PESHAWAR

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ABSTRACT… Objectives: To note ultrasound findings in patient of Dengue Fever in pediatric age group and to find relation between ultrasonographic findings and severity of disease in terms decrease in platelets. **Study Design:** Cross sectional descriptive study. **Setting:** Department of Pediatric Khyber Teaching Hospital, Peshawar. **Period:** August 2017 to Dec 2017. **Methodology:** Data was collected randomly from 183 patients using pre designed questionnaire by interviewers for biodata, ultrasonography for radiological findings and analyzed by SPSS 21.0. Mean ± standard deviation was calculated for numerical variables like age where as for categorical variables frequency and percentage was calculated. **Results:** In the study 56.3% were males while 43.7% were recorded as females with mean age of 6.53 ± 3.40 Years. 18.6% showing anti-dengue serology (IgG & IgM) positive while 94.5% subjects showed positive NS-1, in other investigations 87% had thrombocytopenia in different categories with mild > moderate > severe. In the ultrasongraphic findings hepatomegaly and spleenomegaly shared maximum numbers of 28.4% while Ascites 23.5%, Pleural Effusion 7.1% & Gall Bladder thickness 7.1%. A P-Value of ≤0.05 was found when all these ultrasonographic findings were correlated with severity of disease in terms of decrease in numbers of platelets. **Conclusion:** DEN Virus is common most disease in our part of world. This study shows maximum number of patients with NS-1 shows hepatomegaly and spleenomegaly in ultrasonographic changes and the positive relation has been shown between decrease in platelets count with ultrasonographic findings.

Key words: Dengue, Thrombocytopenia, Serology, Ultrasonography.

INTRODUCTION

Infection caused by DEN Virus is most rapidly spread and transmitted mosquito bite disease having annual incidence of about 50 Million.[1] Aedes Aegypti and Ae. Albopictus from fla-vi virus family are the vectors of this RNA Virus (DEN), however Aedes Aegypti causing Dengue fever is more prevalent in our Urban Areas, species of fla-vi virus Ae albopictus is also being detected in Khyber Pakhtunkhwa and Punjab during Dengue outbreak season.[2-4] In last decade the dengue graph has ascended greatly & of total population more than 40% are at risk.[5] Dengue children shows many typical changes ranging from self limiting fever having arthralgia, myalgia, headache, rash, vomiting and diarrhea with atypical changes involving hepatic system (causing protein imbalance leading to increased plasma leakage) to Central Nervous System changes leading to hemorrhagic complications like dengue hemorrhagic fever (DHF) markedly seen with derangement of all blood cells & clotting profile (severity of disease is directly proportional to damage done to these systems).[6-13]

Plasma leakage diagnosis can be made in a number of ways including diagnosis by means of radiography like effusion in pleural space & pericardial space, fluid in abdomen (Ascites), thickness of Gall Bladder Wall and by hypoproteinaemia / hemoconcentration of blood, among these hemoconcentration is most widely used mean.[14-19] Early diagnosis of plasma leakage and, thus, of DHF are important for the outcome of this disease, in early period ascites and effusion can't be diagnosed by simple radiology and

clinical examination whereas Ultrasonography is a good mean for detection of these in minimal amounts at any stage of this disease helping in diagnosis of DHF at earlier stage.[20-23]

The objective of this study was to note ultrasonographic (USG) findings used for diagnosing plasma leakage in patients managed with diagnosis of DF. Additionally, DF patients were compared in terms of severity of illness and the diagnostic basis of leak in patients of pediatric age among admitted patient in Department of Pediatrics KTH when dengue outbreaks were rampant.

MATERIAL AND METHODS
This cross sectional descriptive study was conducted at Department of Pediatric Unit B, Khyber Teaching Hospital, Peshawar from August 2017 to Dec 2017 having dengue outbreak rampant. A sample of 183 patients admitted in the department who were diagnosed by anti dengue serology as cases of dengue fever were included in our study, whereas all those having myelo-proliferative, lympo-proliferative, thalasemia or aplastic anemia were excluded from the study. This serological evidence was based on identification of positive non structural protein 1 (NS-1) antigen in blood, IgM dengue specific immunoglobulin or >4 times rise in paired dengue specific IgG, if the other two are negative.[15-17] Grading of severity was done via platelets count as mild (between 50 to 100 $\times$ 10^9 / L), moderate (between 20 to 50 $\times$ 10^9 / L), and severe (severe $\leq$ 20 $\times$ 10^9 / L).[24] A predesigned questionnaires was used to collect the data including questions regarding bio data and with use of Ultrasonography to detect Ascites, Pleural Effusion, Gall Bladder Thickness, Hepatomegaly and Spleenomegaly. SPSS 21.0 was used to analyze the data. Mean $\pm$ Standard Deviation was calculated from numerical variables like age, Frequency and Percentage was calculated from categorical variables, which were presented in the form theory, tables and graphs where needed. Chi-Square was used to compare variable, P-value $\leq$ 0.05 was considered statistically significant.

RESULTS
Sample of 183 pediatric age group patient were taken, out of which 103 (56.3%) were male and 80 (43.7%) were female with mean age of 6.53 $\pm$ 3.40 Years. In dengue serology about 173 (94.5%) were positive for NS-1 where as 34 (18.6%) were positive for Anti dengue serology (IgG, IgM). The platelets count of the patients shows maximum with Mild thrombocytopenia 88 (48.1%) followed by Moderate Thrombocytopenia 47 (25.7%) and Severe Thrombocytopenia 23 (12.6%) while 25 (13.7%) were normal based on Table-I.

The study shows in Ultrasonographic findings of the samples 52 (28.4%) each showed hepatomegaly and spleenomegaly while 43 (23.5%) samples showed Ascites, 19 (10.4%) Plueral Effusion (either unilateral or bilateral) and 13 (7.1%) showed Gall Bladder Thickness. Comparison of Ultrasonographic changes with severity of disease in terms of decrease in Platelets clearly shows that patients with severe thrombocytopenia showing maximum of these findings with P-Value statistically significant based on Table-II.

Investigations		N	%
Dengue Serology	NS-1 +ve	173	94.5
	Serology (IgG,IgM)	34	18.6
Platelets count	Normal	25	13.7
	Mild Thrombocytopenia	88	48.1
	Moderate Thrombocytopenia	47	25.7
	Severe Thrombocytopenia	23	12.6
Table-I. Investigation results among patients (n=183)			

Ultrasonographic Findings		Platelets Count				df	P-Value
		Severe Thrombocytopenia	Moderate Thrombocytopenia	Mild Thrombocytopenia	Normal		
Ascites	Yes	15	9	15	0	3	≤ 0.05
	No	8	38	73	25		
Pleural Effusion	Yes	9	6	4	0		
	No	14	41	84	25		
Gall Bladder Thickness	Yes	8	3	2	0		
	No	15	44	86	25		
Hepatomegaly	Yes	22	17	13	0		
	No	1	30	75	25		
Spleenomegaly	Yes	22	22	8	0		
	No	1	25	80	25		

Table-II. Comparison of Ultrasonographic findings with severity of disease in terms of decrease in Platelets (n=183)

DISCUSSION

Dengue is one of epidemic in Pakistan for last a decade or so, this study determines ultrasonographic changes in patients of dengue fever in pediatric age group and compares the same changes with severity of disease.

This study have 103 (56.3%) male and 80 (43.7%) female, may be due to cultural norms where male seek more health facilities than females and also females remains more covered than male, making the ratio about 3:2 for male: female supported and showed by a study done by Arshad K et al showing same 3:2 ratio for gender that is (54.8% male & 45.2% Female) conducted at Department of paeds, Allied Hospital Faisalabad, a same results were shown by Parveen A S in a study conducted at India while more admissions during winter season can be supported by the breading season of these mosquitoes in this season.[25-27]

In this study having 173 (94.1%) positive for NS-1 and 34 (18.6%) samples having positive anti dengue serology (IgG & IgM) 56 (30.60%) samples as a whole showed ultrasonographic changes with maximum showing hepatomegaly and spleenomegaly as showed by Srinivasa S et al during a study in India where Ascites is more common than Pleural Effusion and Gall Bladder thickness showed by Asghar J et al at Ghurki Lahore.[28-29]

In the study we can see clearly that with severity of disease the number ultrasonographic findings increases as the platelets decrease in amount, in severe thrombocytopenia all findings of Ascites, Plueral Effusion, Gall Bladder thickness, Hepatomegaly and Spleenomegaly was recorded in maximum patients showing a strong correlation with disease severity, the figures also recorded Vedaraju K S et al in a study conducted at India shows the same maximum sample having utrasonographic findings in severe thrombocytopenia followed by moderate thrombocytopenia and then mild thrombocytopenia making the comparison of Ultrasonographic findings with severity of disease in terms of decrease in platelets strongly significant.[30]

CONCLUSION

In our part of the world dengue is one of the most common disease, this disease presents with various features, but early diagnosis and prompt management can help in decreasing case fatality rate. This shows the ultrasonographic findings that can be noted in the patients of Dengue Fever with its correlation with severity of the disease adopted as per guidelines and availability of resources. The study clearly shows a strong and positive correlation in maximum cases reported to have positive ultrasonographic findings with severity of disease in terms of thrombocytopenia. **Copyright© 20 May, 2018.**

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If opportunity doesn't knock, build a door.

– Milton Berle –

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Rifaq Zeb	Collection, Assembly of data & Drafting.	
2	Mian Saad Ahmed	Conception, Design, Analysis & Interpretation of the data.	
3	Junaid Zeb	Critical revision, Statistical expertise & guarantor.	