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A Study of Clinical Manifestations and Complications of Dengue Fever with Special Reference to Acute Kidney Injury and Its Outcome

Monika Dhankher¹ Manjit² Anubhav Dabas³ H.K. Aggarwal⁴ Deepak Jain⁵ ¹Resident^{, 2, 3}Senior resident, ⁴Senior Professor & Head, ⁵Professor

Departments of Medicine & Pathology, Pt. B.D. Sharma University of Health Sciences, Rohtak (Haryana)

*Corresponding Author:

Dr. Manjit

Senior resident, Department of Medicine, Pt. B.D. Sharma University of Health Sciences Rohtak-124001 (Haryana)

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ABSTRACT

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INTRODUCTION

World Health Organization (WHO) identifies dengue as the most rapidly spreading mosquito borne disease in the world which is quickly crossing regional borders. It is caused by dengue virus which is a Flavivirus transmitted by bite of Aedes aegypti mosquito.1 In the last 50 years, incidence has increased by 30-fold with increasing geographic expansion to new countries and in the present decade, from urban to rural settings. An estimated 50 million dengue infections occur annually and approximately 2.5 billion people live in dengue endemic countries.2 It is distributed worldwide throughout tropics and subtropics between 30oN and 40oS and endemic in South East Asia including India, Pakistan and Sri Lanka.

Dengue is caused by four antigenically distinct viruses designated as dengue virus type 1-4 (DEN-1, DEN-2, DEN-3 and DEN-4) belonging to genus flavivirus of family flaviviridae. All the 4 serotypes of dengue viruses are primarily transmitted by aedes aegypti.3 Symptomatic dengue virus infections can present with a wide range of clinical manifestations from mild febrile illness to life-threatening shock syndrome or organ dysfunction.4 Expanded Dengue Syndrome (EDS) is new entity added to WHO guidelines to incorporate wide spectrum of unusual manifestations of dengue infection affecting various organ systems. The involvements of various organs are increasingly being reported in DHF, while EDS can also occur in DF cases without evidence of plasma leakage.4 Like other tropical infections, DVI is associated with multiple organ dysfunctions effecting liver, muscles, heart, brain, and kidneys.5,6

Dengue is common viral infection in developing country like India. The word "dengue" is derived from Swahili phraseka-dinga pepo means "cramp like seizure". First clinical case report was by Benjamin Rush in Philadelphia, who describes dengue as "Back bone fever" because of symptoms of myalgia and arthralgia.7 The patients with dengue fever typically present with the sudden onset of fever, frontal headache, retroorbital pain, and back pain along with severe myalgias—breakbone fever. Additional signs and symptoms include anorexia, nausea, vomiting, and cuta neous hypersensitivity. Epistaxis and scattered petechiae are often noted in uncomplicated dengue.8

AKI is a known complication in patients infected with dengue. These findings suggest that DAKI involves financial burden to patients and healthcare system that is of particular importance in resource limited settings, especially in dengue epidemic regions. Shock secondary to hemorrhage or dengue shock syndrome and rhabdomyolysis leading to acute tubular necrosis are main causes of AKI. Direct involvement of the kidneys leading to AKI has also been suggested in patients who develop AKI without associated shock or rhabdomyolysis.9 Spectrum of renal disorders is least studied in dengue infection that varies from mild glomerulonephritis, urinary sedimentations to severe Acute Kidney Injury .10 This study was undertaken to known the various clinical manifestations and complications of dengue fever and acute kidney injury and its outcome.

MATERIAL AND METHODS

This was a prospective observational study conducted on 150 adult patients aged more than 18 years diagnosed with dengue fever between July 2017 to December 2020 in medicine department at Pt. B. D. Sharma, PGIMS Rohtak, Haryana. Patients aged less than 18 years or more than 75 years, patients having nosocomial infections, chronic infections, fever due to non infectious etiologies were excluded from the study. Patients of chronic kidney disease, acute kidney injury secondary to non infectious etiologies, lower urosepsis, respiratory tract infections, hematological malignancies, other infectious diseases chikungunya and HIV infection, immunocompromised immunosuppressed or individuals and pregnant females were also excluded from the study. The patients who fulfilled WHO criteria for dengue fever, dengue hemorrhagic fever (DHF), dengue shock syndrome (DSS) and expanded dengue syndrome were included. The clinical history, physical findings and laboratory investigations like Hemoglobin percentage (Hb%), Total and differential WBC Count, Erythrocyte sediment rate (ESR), Platelet Hematocrit, count. Urine routine examination, Random blood glucose (RBS), Blood urea and serum creatinine, Serum electrolytes, Liver function test (LFT), Prothrombin time, Activated partial thromboplastin time (APTT), Chest X-ray, Ultrasonography (USG) abdomen, Electrocardiogram (ECG), Cerebrospinal fluid (CSF) analysis and Computed tomography (CT) Scan if required. NS1Ag (Non-structural protein), IgM and IgG dengue antibodies were estimated using Rapid strip test (J. Mitra & co. Pvt. Ltd.) that helped in diagnosis of dengue fever. KDIGO guidelines were used for AKI

diagnosis and classification.11Dengue fever was considered in patients who had clinically manifestations symptoms specific to dengue fever such as headache, myalgia, retroorbital pain and arthralgia with positive for NS1Ag, IgM and IgG dengue antibodies using Rapid strip test (J. Mitra & co. Pvt. Ltd.). All patients were evaluated for AKI on day of admission and then subsequently on day 3, 7 and 14 with laboratory investigations i.e. serum creatinine, blood urea, urine output and eGFR.12

STATISTICAL ANALYSIS:

AKI was considered as explanatory variable. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Categorical outcomes were compared between study groups using Chi square test/student's t test. The trend of laboratory values from admission to final follow up, at different time intervals was assessed by comparing the mean values, using one-way repeated measures ANOVA. Data were analyzed and statistically evaluated using SPSS 22.0 software.13

RESULTS:

The present study included 150 adult patients of dengue. The mean age was 37.9 ± 12.01 years. Minimum age was 18 years and maximum was 62 years. Among the study population 102 people were males. Among 150 cases, 45 (75%) presented from the month of July to September, while 15 (25%) presented during the cooler months of October and November. Baseline and following parameters of dengue patients are depicted in table no.1.

It was observed that among males maximum (40.2%) were in the age group of 18-30 years followed by 31.4% in the group of 31-40 years, 14.7% in the age group of 41-50 years and minimum were in the age group of >60 years (3.9%). Among females, the maximum (39.6%) were in the age group of 31-40 years followed by 18-30 years (31.3%), 41-50 years (20.8%) and minimum was in the age group of >60 years (2.1%).

In the present study the most common presenting symptoms were fever (100%) followed by headache (86.5%), abdominal pain (53.3%), myalgia (60%), arthralgia (65.3%), nausea and vomiting (56.7%), retroorbital pain (49.3%), rashes (30%- purpura, petechie and ecchymosis), bleeding manifestations

(23.3%-like epistaxis, gum bleeding, haematuria, malena and haematemesis), jaundice (26.7%), lymphadenopathy (30%), free fluid (20%),pallor (10%) and bradicadia (6.7%). Out of 25 patients having hypotension, 10 patients were improved with fluid and and remaining 15did not improved with fluid . 10 patients had developed dyspnoea, among them 5 showed features of acute respiratory distress syndrome (ARDS) and 2were on BIPAP and recovered and remaining 3 were on ventilators and died despite of optimum therapy. (as given in table 2)

In the present study, out of 150 patients 80% patients (platelet thrombocytopenia had count <1.5 lakhs/cu.mm), 33.3% had leucopenia (TLC<4000cells/cu.mm), 30% patients had increased haematocrit (>45%), 40% patients had deranged LFT and 10% patients were anemic (Hb<10g %). Mostly patients had leucopenia in first 5-7 days followed by thrombocytopenia and recovered with in two weeks. Among 150 patients 52% patients had platelet count between 50,000-1.0 lakh, 12% patients had >1.5 lakhs, 14% patients had between 20,000- 50,000 and only 8.7% patients had platelet count below 20,000. Out of 100 patient's dengue serology positive cases, 80% patients were positive for NS1 antigen, 8% patients were positive for IgM antibodies and rest 12% patients were with mixed positivity.

In the present study 33.3% patients showed hepatic dysfunction, 20% patients showed pleural effusion. Abnormal coagulation profile was noted in 8% of patients, 3.3% of patients developed acute respiratory distress syndrome (ARDS), 2% had neurological manifestation like encephalopathy and 1.3% had intracranial hemorrhage. 1.3% had rhabdomyolysis. (as given in table 3)

Out of 150 patients, 125 patients had dengue fever, 10 had dengue hemorrhagic fever, 8 had dengue shock syndrome and 7 had expanded dengue syndrome. Out of 150 patients, 15 patients had acute kidney injury. Out of 125 dengue fever patients, 2 had acute kidney injury stage I. Out of 10 having dengue hemorrhagic fever, 5 had AKI ,2 had AKI staging I, 2 had AKI staging II and 1 had AKI staging III having renal replacement therapy but did not respond and died despite optimum therapy. Out of 10, 4 did not respond to treatment and died. Out of 8 patients having dengue shock syndrome, 6 had AKI. 1 had AKI staging I, 2 had AKI staging II and 3 had AKI staging III. 2 had continuous renal replacement therapy but did not respond and died despite optimum therapy. 3 patients having dengue shock syndrome did not respond and died. Out of 7 patients having expended dengue syndrome, 2 patients had rhabdomyalysis having AKI staging III received renal replacement therapy but did not respond and died despite optimum therapy. 3 patients had encephalopathy, among these one did not respond to treatment and died. 2 had intracranial hemorrhage. (as given in table 4)

In the present study among 150 cases, 83.3%% patients had dengue fever with no mortality, 6.7% patients had dengue hemorrhagic fever (DHF) with 40% mortality and 5.3% patients had dengue shock syndrome (DSS) with 37.5% mortality and 4.7% patients had expended dengue syndrome with 42.9% mortality .Baseline and following parameters of dengue patients having AKI are depicted in Table no 5.

The mean duration of hospital stay (Days) in people with AKI was 18.75 ± 6.58 , as compared to $9.88 \pm$ 0.66 for people without AKI and difference was statistically significant (P value <0.001). The important predictors of acute kidney injury were Age, SpO2 on admission, Temperature, Hemoglobin, total leucocytes count, neutrophils, lymphocytes, absolute platelets count, jaundice, transaminitis, oligiuria, systolic blood pressure and hospital stay. (as given in table 6)

DISCUSSION:

Dengue fever (DF) is a viral hemorrhagic fever causing severe morbidity and mortality in affected patients. In present study, 68 % were male and 32% were female. The maximum prevalence was noticed in the age group of 18-30 years (38%). This indicates that the disease affects younger and productive age group. The incidence of age group is similar to studies conducted by Gupta E et al14 (21 to 30 years) and Doke P & Pawar S15 (15-40 years). Males outnumbered females, this is partly because in India they are less covered by clothes than females and also they move out of their place more commonly than females thus exposing themselves to mosquitoes bites. In the present study male to female ratio is 2.12:1 which is similar to the study conducted by Deshwal R et al16, which observed male to female ratio of 2.67:1.

Page ,

In the present study the most common presenting symptoms were fever (100%) followed by headache (86.5%), abdominal pain (53.3%), myalgia (60%), arthralgia (65.3%), nausea and vomiting (56.7%), retroorbital pain (49.3%), rashes (30%- purpura, petechie and ecchymosis), bleeding manifestations (23.3%-like epistaxis, gum bleeding, haematuria, malena and haematemesis), jaundice (26.7%), lymphadenopathy (30%), free fluid (20%),pallor bradicadia (6.7%). In present study (10%) and clinical manifestations of dengue are similar to Laul A et al17 study observed fever other.17-20 (100%), headache (87%), bodyache (86%), backache (58%), retro- orbital pain (41%), vomiting (68%), abdominal pain (57%), rash (21%), bleeding manifestations (21%) and dysponea (19%). Kumar A et al18 study observed fever (99.1%) as most common symptom followed by myalgia (64.6%), vomiting (47.6%) and bleeding manifestation (26.6%). Itoda I et al19 study headache was observed in 90% patients. In the present study abdominal pain was observed in 53.3%, Daniel R et al20 observed abdominal pain in 62.4%. In the present study 30% patients had skin rashes which are all most similar observation with Mandal S K et al21 study who observed skin rashes in 37.84%. In the present study 30% had hepatosplenomegaly, similar to study by Laul A et al17.

In the present study most common hematological observation was thrombocytopenia (platelet count < 1.5 lakhs/cumm) in 80%. Study by Seema A et al22 showed thrombocytopenia in 84%. In the present study 33.3% patients showed leucopenia, 30% increased haematocrit, 40% deranged LFT and 10% were anemic. Study by Daniel R et al20 observed anemia in 6%, leucopenia in 40%, increased haematocrit in 27.9% and deranged LFT in 84%.

The Present study showed dengue fever in 83.3%, DHF in 6.7%, DSS in 5.3% and EDS was in 4.7%. In a study by Sharma S and Sharma SK23 DHF was in 10.5% and DSS was in 3.2%. DF observed in 73% cases, DHF in 16.5% and DSS in 1.7% in a study by Laul A et al17. In the present study showed dengue fever as most common manifestation.

In the present study out of 100 patient's dengue serology positive cases, 80% patients were positive for NS1 antigen, 8% patients were positive for IgM antibodies and rest 12% patients were with mixed positivity. Khan S A et al24 study showed NS1 91.5%, IgM 4.6%, both NS1 and IgM positive in 3.7%.

In the present study 33.3% patients showed hepatic dysfunction, 20% patients showed pleural effusion. Abnormal coagulation profile was noted in 8% of patients, 3.3% of patients developed acute respiratory distress syndrome (ARDS), 2% had neurological manifestation like encephalopathy and 1.3% had intracranial hemorrhage. 1.3% had rhabdomyolysis and 16.7% had hypotension. Wiwanitki V25 study observed overall rate of liver dysfunction in 34.6%. Vasireddy S et al26 study showed pleural effusion (30%), hypotension (14%), pneumonia (10%), renal failure (3%), ARDS (3%). In the present study 3% had neurological manifestation like encephalopathy. Verma R et al27 study observed that 15.3% patients had encephalopathy.

Our study showed that 10% had acute kidney injury and 3.3% had received renal replacement therapy. A recent study from India reported AKI in 10.8% of patients with dengue infection.28 A study from Taiwan reported symptomatic renal failure in about 4% of dengue infected patients.29 Kuo et al. and Basu et al. reported very high incidence of DAKI by using RIFLE criteria (27.1%) and 35.7% respectively).29,30. AKI in dengue infection has favorable outcomes but 10 - 20% of patients may further require dialysis after AKI.31 Additionally, use of different definitions not only causes great disparity in incidence but also variations in clinicolaboratory characteristics that make it difficult or even impossible to compare studies.32

Almas et al. did not find AKI as significant predictor of mortality in multivariate analysis, though unadjusted analysis demonstrated that patients with AKI were more likely to die.33 It has been proposed that oliguric AKI is associated with higher mortality than nonoliguric AKI.34 Laoprasopwattana et al. found that patients who had oliguric AKI had a higher mortality rate than those with non-oliguric AKI, though in his study oliguric AKI was found in 17 patients only.35 Renal involvement is more commonly seen in dengue hemorrhagic fever and dengue shock syndrome and they are also independent predictor of mortality.36 Most of the studies, included in current review, lack postdischarge follow-up among AKI patients. AKI can

directly cause End-Stage Renal Disease and increase the risk of developing incident of Chronic Kidney Disease and worsening of underlying CKD.37 Morphological changes in glomeruli may lead to CKD and it has been already proposed that dengue changes virus causes such type of in glomerulus.37,38 So far, no study objectively described any association of DAKI with CKD, though Laoprasopwattana et al. followed-up 9 patients with DAKI after discharge and found no development of CKD in them.35 Additionally, serum creatinine levels returned to normal during median 32 days in these patients.35

Currently there is no specific treatment for dengue induced AKI. Monitoring of fluid status. management of dengue associated coagulopathies and maintenance of electrolyte balance are some crucial measures to treat these patient.1,5 Dengue induced AKI - usually severe AKI - sometimes requires dialysis that has proved to be beneficial, 35, 39, 40 though further studies are needed to optimize dialysis in dengue patients when it is needed.

The mean duration of hospital stay (Days) in people with AKI was 18.75 ± 6.58 , as compared to 9.88 ± 0.66 for people without AKI and difference was

statistically significant. Khalil et al. demonstrated that patients with AKI had longer length of hospital stay than patients without AKI.41

In our study mortality rate was 6.7%.but other studies showed mortality rate of 3.2% and 4.14%.14,20 According to the WHO report, the mortality in untreated cases of dengue fever was reported to be as high as 20%, while the hospitalized patients had a mortality rate of less than 1%.42

Conclusion: The study is majority cases were simple dengue fever with common clinical manifestation and no mortality. In patients with dengue hemorrhagic fever ,dengue shock syndrome and expended dengue syndrome shows more mortality andmore severe complications. There is increase in incidence day by day because of poor sanitation, rapid urbanization, insecticide resistance and lack of health education. So a continuous seroepidemiological surveillance, early identification and proper confirmation of diagnosis of dengue infection will prevent complications and mortality.

Limitation of study: As this study was done at tertiary care level, the representation of more sick patients are likely in study group. Hence the finding can not be generalized.

	Baseline	Day 3 follow up	Day 7 follow up	Day 14 follow up	P*value
Hemoglobin (g/dl)	11.33 ± 2.2	10.43 ± 1.5	11.88 ± 1.7	11.14 ± 1.4	0.08
Hematocrite (%)	40 ±3.5	38 ±2.4	34 ±1.3	34% ±1.0	0.05
Total Leucocytes Count	4528±1789.33	5791 ± 1178.83	6054±1269.05	6498 ± 1296	0.07
Absolute Platelets Count	89910±10408.19	50480 ± 14534.25	100990±10417.57	160200± 16233.49	<0.001
Blood urea(mg/dl)	50.59 ± 27.80	55.49 ± 22.55	39.37 ± 25	18.42 ± 14.3	< 0.001
Serum creatinine (mg/dl)	1.62 ± 1.3	1.45 ± 1.2	1.04 ± 0.80	0.89 ± 0.44	< 0.001
Corrected Serum Calcium (mg/dl)	9.31 ± 0.50	9.15 ± 0.36	8.89 ± 0.33	9.20 ± 0.21	0.19
osp Serum phosphate	4.8 ± 0.38	3.9 ± 0.42	3.8 ± 0.41	3.4 ± 0.37	0.09
Serum Uric Acid (mg/dl)	4.87± 1.09	3.55 ± 1.14	3.39 ± 0.75	2.84 ± 0.75	0.11

Table1: Baseline and follow up of Haematological and Renal parameters in dengue fever patients (n=150)

Serum Protein (g/dl)	7.31 ± 0.29	7.22 ± 0.25	7.11 ± 0.25	7.18 ± 0.32	0.12
Serum Albumin (g/dl)	2.99 ± 0.24	3.21 ± 0.22	3.59 ± 0.17	3.59 ± 0.22	0.07
Serum bilirubin (mg/dl)	4.8 ± 3.1	3.9 ±2.1	3.5 ± 1.5	3.0 ± 1.2	0.05
SGOT(u/L)	80 ± 35	79±25	55 ± 20	50 ± 17	0.05
SGPT (U/L)	92 ± 24	80 ± 22	69 ± 16	60±14	0.05
Serum sodium (meq/l)	140.35 ± 2.99	138.45 ± 2.14	137.22 ± 2.84	141.79 ± 3.39	0.14
Serum Potassium (meq/l)	3.23 ± 0.34	3.71 ± 0.35	3.68 ± 0.37	3.78 ± 0.31	0.15
Urine Output (ml)	806.3 ± 443.89	1007.8 ± 425.58	1201.5 ± 335.48	1414.5 ± 307.95	< 0.001
eGFR (ml/min/1.73m ²)	70.66 ± 43.22	82.53 ± 43.64	89.94 ± 43.61	97.94 ± 40.22	< 0.001

Repeated ANOVA test*

Table 2: Clinical Features of Patients with dengue fever (n=150)

Signs and Symptoms	Number(%)	Signs and Symptoms	Number(%)
Fever (>100°F)	150(100%)	Jaundice	40(26.7%)
Myalgia	90(60%)	Rash	45(30%)
Headache	130(86.5%)	Lymphadenopathy	45(30%)
Nausea and vomiting	85(56.7%)	Breathlessness	10(6.7%)
Arthralgia	98(65.3%)	Pallor	15(10%)
Abdominal pain	80(53.3%)	Bradicardia	10(6.7%)
Systolic blood pressure <90 mm hg	25(16.7%)	Bleeding manifestations	35(23.3%)
Hepatomegaly	50(33.3%)	Cyanosis	3(2%)
Splenomegaly	45(30%)	Free fluid (ascitis)	30(20%)
Hepatosplenomegaly	30(20%)	Retroorbital pain	74(49.3%)
Oligouria	15 (10%)	Gall bladder wall edema	60 (40%)

Table- 3: Complications of dengue (n=150)

Complications	Number of patients(%)
Acute kidney injury	15 (10%)
Acute respiratory distress syndrome (ARDS)	5 (3.3%)
Pleural effusion	30 (20%)
Hepatic dysfunction	50 (33.3%)
Abnormal coagulation profile	12(8%)
Encephalopathy	3(2%)
Rhabdomyolysis	2(1.3%)
Intracranial hemorrhage	2(1.3%)

Page 80

	NUMBER(%)	AKI STAGING	I	II	III	RRT	DEATH
DF	125(83.3%)	2	2	0	0	0	0
DHF	10(6.7%)	5	2	2	1	1	4
DSS	8(5.3%)	6	1	2	3	2	3
EDS	7(4.7%)	2	0	0	2	2	3
TOTAL	150	15	5	4	5	5	10

 Table4: AKI staging in AKI associated Scrub typhus patients (N=34)

Table 5: Comparison	of Haematological	and Renal p	arameters in	Dengue fe	ever with a	cute kidney i	injury
patients on follow up ((15)						

	Baseline	Day 3 follow up	Day 7 follow up	Day 14 follow up	P*value
Hemoglobin (g/dl)	9.44 ± 2.2	10.42 ± 15	10.98 ± 1.5	10.44 ± 1.3	0.06
Hematocrite (%)	41 ±3.5	40 ±2.4	33 ±1.3	33% ±1.0	0.05
Total Leucocytes Count	4928±1899.33	5791 ± 1338.83	6654±1229.05	6498 ± 1036.11	0.05
Absolute Platelets Count	64071±5408.19	40480 ± 1534.25	118990±20417.57	160200± 16233.49	<0.001
Blood urea(mg/dl)	97.59 ± 57.80	75.49 ± 42.55	50.37 ± 25	39.42 ± 14.3	< 0.001
Serum creatinine (mg/dl)	2.62 ± 1.38	2.35 ± 1.25	2.40 ± 0.80	1.89 ± 0.44	<0.001
Corrected Serum Calcium (mg/dl)	9.22 ± 0.50	9.24 ± 0.36	8.99 ± 0.33	9.21 ± 0.26	0.16
Serum phosphate	6.8 ± 0.38	5.9 ± 0.42	3.8 ± 0.71	3.3 ± 0.33	0.07
Serum Uric Acid (mg/dl)	6.8 ± 1.09	4.55 ± 1.14	3.39 ± 0.75	2.84 ± 0.71	0.08
Serum Protein (g/dl)	7.00 ± 0.29	7.23 ± 0.25	7.11 ± 0.25	7.07 ± 0.31	0.10
Serum Albumin (g/dl)	2.69 ± 0.24	3.11 ± 0.22	3.39 ± 0.17	3.69 ± 0.21	0.06
Serum bilirubin (mg/dl)	7.8 ± 3.1	5.9 ±2.1	4.4 ± 1.5	3.8 ± 1.1	0.05
SGOT(u/L)	110 ± 35	90± 23	76±20	65 ± 17	0.04
SGPT (U/L)	106 ± 39	90 ± 22	84 ± 26	76±16	0.05

	141.05 0.00	140.45 0.16	100 00 0 10	100 70 0 70	0.11
Serum sodium (meq/l)	141.35 ± 2.98	140.45 ± 2.16	138.22 ± 2.43	138.79 ± 3.78	0.11
Serum Potassium (meq/l)	3.33 ± 0.33	3.81 ± 0.36	3.78 ± 0.31	3.79 ± 0.33	0.17
Urine Output (ml)	406.3 ± 103.89	507.8 ± 125.58	901.5 ± 335.48	1074.5 ± 307.95	< 0.001
$eGFR (ml/min/1.73m^2)$	39.66 ± 23.22	50.53 ± 13.64	59.94 ± 13.61	67.94 ± 20.22	< 0.001

Repeated ANOVA test*

Table 6: Predictive factors associated with AKI in dengue. (N=150)

Parameter		I	AKI		*P value	
	Present	(N=15)	Absent	(N=135)		
	Mean	\pm SD	Mean	\pm SD		
Age (Years)	38.33 ±	11.33	35.56 ±	11.19	0.00)7
Gender	1		1		[#] P value	
Male	10 (66.	7%)	92 (68.	.15%)		
Female	5 (33.3	3%)	43 (31.	.85%)	0.534	
Diagnosis	1		1		[#] P value	
Scrub typhus	15 (10%)		135 (90%)		< 0.001	
PHYSICAL EXAMIN	ATION PA	RAMETE	RS			
Parameter	Mean ± SD		$Mean \pm SD$		*P value	
Systolic BP(mm Hg)	95.11 ± 7.92		110.85 ± 9.01		0.435	
Diastolic BP(mm Hg)	60.94 ± 6.53		75.74 ± 7.25		0.145	
Pulse rate(per min.)	99.56 ±	99.56 ± 10.05 81.06 ± 8.		± 8.62	0.324	
SPO2(%)	94.03	± 2.1	97.47	± 1.2	<0.001	
Temperature(°F)	102.65	± 0.83	101.92	± 1.1	<0.001	
Biochemical paramete	ers		1		1	
Parameter		Mean ± SD		Mea	$n \pm SD$	*P value
Hemoglobin (g/dl)		10.5	7 ± 2.8	11.91 ± 1.81		0.005
Total Leucocytes Count (per mm ³)		4015.63 ± 1222.75		5075 ± 1088.42		<0.001
Neutrophils(per mm ³)	ils(per mm ³) 68		7 ± 10.85 60.92		± 7.62	<0.001
Lymphocytes(per mm ³)		18.47	± 10.16	24.1	± 7.18	<0.001

Absolute Platelets Count(per mm ³)	49444.44 ± 11298.68	59852.94 ± 16484.38	0.014

Parameter	Mean \pm SD	Mean ± SD	*P value
Blood urea (mg/dl)	90.97 ± 60.11	35.29 ± 3.17	<0.001
Blood sugar (mg/dl)	87.56 ± 11.6	92.22 ± 8.23	0.410
Serum creatinine (mg/dl)	2.69 ± 1.67	0.93 ± 0.11	<0.001
Corrected Serum Calcium (mg/dl)	9.22 ± 0.63	9.11 ± 0.47	0.134
	1.00 0.10	2.41.0.25	0.100
Serum phosphate (mg/dl)	4.32 ± 0.43	3.41 ± 0.35	0.109
Serum Uric Acid (mg/dl)	3.88 ± 1.67	3.24 ± 0.62	0.141
	7.00 0.01	7.10.0.07	0.110
Serum Protein (g/dl)	7.32 ± 0.31	7.12 ± 0.27	0.110
Serum Albumin (g/dl)	3.01 ± 0.29	3.37 ± 0.2	0.064
Serum bilirubin (mg/dl)	9.5 ± 3.1	6.5 ± 3.2	<0.001
SGOT(u/L)	90 ± 36	86 ± 3.1	0.05
		100 - 25	0.05
SGPT (U/L)	106 ± 32	100 ± 35	0.05
Serum sodium (meq/l)	139.41 ± 3.71	142.32 ± 2.61	0.898
Comme Dotossium (mos/l)	2.45 ± 0.5	276 + 0.16	0.142
Serum Polassium (meq/1)	5.43 ± 0.3	5.70 ± 0.10	0.142
Urine Output (ml)	405.19 ± 354.5	1593.53 ± 233.48	<0.001
$eGFR (ml/min/1.73m^2)$	42.05 + 23.31	107 94 + 25 27	<0.001
	.2.00 _ 20.01		
Hospital stay (days)	18.75 ± 6.58	9.88 ± 0.66	<0.001

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*Student's t- test

[#]Chi square test

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