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Research Article

**HAEMODIALYSIS REQUIREMENT IN PATIENTS WITH
MALARIAL ACUTE KIDNEY INJURY**¹ Dr. Asma Memon, ² Dr. Bhagwan Das, ³ Dr. Javed Altaf,⁴ Dr. Santosh Kumar, ⁵ Dr. Abdul Manan Junejo and ⁶ Dr. Bella Dayo¹Senior Registrar Department of Nephrology Shaheed Mohtarma Benazir Bhutto Medical College Lyari Karachi, Sindh, Pakistan²Assistant Professor Department of Nephrology, LUMHS Jamshoro, Sindh Pakistan³Assistant Professor Department of Urology, LUMHS Jamshoro, Sindh Pakistan⁴Assistant Professor Department of Nephrology, Jinnah Sindh Medical University Karachi⁵Professor Nephrology, Jinnah Sindh Medical University Karachi Sindh Pakistan⁶Post-graduate resident Department of Nephrology, LUMHS Jamshoro Sindh Pakistan**Abstract:****Objective:** To determine the frequency of haemodialysis requirement in patients with malarial acute kidney injury.**Patients and Methods:** This Cross Sectional study of six months was conducted in the department of Nephrology ward 22, Jinnah postgraduate medical centre, Karachi. The study was done in Jinnah postgraduate medical centre, nephrology unit. Admitted patients with acute kidney injury were inducted in the study. Baseline demographic data including age, gender, educational status, economic status, type of malaria, duration of symptoms and haemodialysis required was recorded on the pre-designed data collection form. Mean and standard deviation of age and duration of symptoms was calculated. Frequencies and percentages of gender, educational status, economic and hemodialysis were calculated.**Results:** Mean age of the patients was 37.1±12.03 years. Most of the patients were male 36(60%) while 24(40%) patients were females. Mean duration of symptoms was 3.63±1.07 days. There were 40 (66.7%) patients with *Plasmodium falciparum* and 20 (33.3%) patients with *Plasmodium vivax*. Overall Hemodialysis required in 35 (58.3%) patients.**Conclusion:** In this study the overall frequency of Hemodialysis requirement was higher in malarial patients with acute kidney injury.**Keywords:** Hemodialysis, malaria, Acute kidney Injury, *Plasmodium Falciparum*, *Plasmodium Vivax***Corresponding author:****Dr. Javed Altaf,**

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INTRODUCTION:

Acute kidney injury (AKI) is defined as a rapid (over hours to weeks) [1] and potentially reversible decrease in kidney function. According to risk, injury, failure, loss and end-stage (RIFLE) classification [1] proposed by acute dialysis quality initiative (ADQI), AKI is characterized by risk, injury and failure according to serum creatinine (> 1.5 times, 2 times and 3 times above baseline) or urinary output (<0.5ml/kg/hour for 6 hours, <0.5 ml/kg/hour for 12 hours & <0.3 ml/kg/hour for 24 hours or oliguria respectively). There are many different causes of acute kidney injury among which malarial infection is one.[2] Malaria associated acute kidney injury has become a major public health menace especially in tropical countries. AKI caused by malarial infection has proven to be a significant contributor to the morbidity and mortality as it is one of the three most common cause of death in patients with severe malaria, after cerebral malaria and septicemia. [3,4]

Plasmodium falciparum infection is one of the most common cause of acute kidney injury, although plasmodium vivax has also been reported. Mehta KSet al reported the prevalence of malarial AKI in south east Asia between 13 to 17.8%. [5] similarly Junejo AM and colleagues noted that malaria was responsible in 19.4% of AKI patients.[6] High mortality in such patients is due to multiple complications, late referrals, and lack of early dialysis facility.[7,8] In a local study 46(19.4%) developed ARF due to falciparum malaria and 78.26% required dialysis.[9]

Since, hemodialysis is an invasive procedure and only few centers offer the facility locally, so there is a need to determine the current burden of haemodialysis among patients with malarial AKI. Therefore by virtue of this study a policy could be made to screen such patients at the earliest and prompt treatment could decrease the burden of hemodialysis in these patients.

PATIENTS AND METHODS:

his cross sectional study of six months was conducted in nephrology ward 22 Jinnah postgraduate medical centre. To determine the frequency of haemodialysis requirement in patients with malarial acute kidney injury. The inclusion criteria were adult patients with AKI and peripheral smear positive for malarial parasite (plasmodium vivax and falciparum), presenting within a week time, normal sized kidneys on ultrasonography and adults above 18 years of age to 60 years while the exclusion criteria were the

presence of any other cause of acute kidney injury other than malaria and the patients with chronic kidney disease. The acute Kidney Injury: urine output <0.5ml/kg for more than 12 hours was considered as AKI while the malarial AKI was diagnosed as urinary output <0.5ml/kg/hour for 12 hours in patients with microscopically confirmed malarial parasite presence in peripheral blood smear and the hemodialysis required when the urine output <0.3ml/kg/hour (>24 hours). The study was done in Jinnah postgraduate medical centre, nephrology unit. Admitted patients with acute kidney injury meeting the inclusion criteria were inducted in the study by the principal investigator after informed consent and approval from the ethical review board. Baseline demographic data including age, gender, educational status, economic status, type of malaria, duration of symptoms and haemodialysis required was labeled as per operational definition was recorded on the pre-designed data collection form. Data was entered and analyzed using SPSS version 19. Mean and standard deviation of age and duration of symptoms was calculated. Frequencies and percentages of gender, educational status, economic and hemodialysis were calculated. Effect modifiers like age, gender, educational status and type of malaria was stratified to see the effect of these on outcome. Chi square test was applied and p 0.05 as significant.

RESULTS:**Mean Age**

Mean age of the patients was 37.1 years with the standard deviation of 12.03 years. The minimum age was 18 and maximum age was 60 years (Table 1).

Age distribution

Age distribution shows that most of patients, 50 (83.3%) were of age >30 years.

Gender distribution

Male patients were in majority, 36 (60%) while 24 (40%) patients were females.

Duration of symptoms

Mean duration of symptoms was 3.63 days with the standard deviation of 1.07 days. The minimum duration of symptoms was 2 days and the maximum duration of symptoms was 6 days (Table 2).

Economic status

Majority of the patients, 28 (46.76%) belonged to lower middle economic status, 25 (41.67%) poor status while only 7 (11.67%) belonged to upper middle economic status.

Educational status

Most of the patients 27 (45%) were metric while illiteracy were 14 (23.33%) patients.

Distribution of Malaria

There were 40 (66.67%) patients with Plasmodium falciparum and 20 (33.33%) patients with Plasmodium vivax.

Overall Hemodialysis required

Hemodialysis required in 35 (58.33%) patients while in 25 (41.67%) patients did not required hemodialysis.

Hemodialysis requirement as per age groups

In age group ≤ 30 years Hemodialysis requirement was found in 7 (70%) patients while in age group > 30 years 28 (56%) patients required Hemodialysis. Chi-square test was applied and no significant effect of age was observed (p-value 0.325) (Table 3).

Hemodialysis requirement as per gender

There were 12 (33.33%) male patients who required Hemodialysis while in female gender 23 (95.8%) patients required Hemodialysis. Chi-square test was applied and significant effect of age was observed (p-value 0.001) (Table 4).

Hemodialysis requirement as per educational status

Among illiterate patients, 9 (64.3%) required Hemodialysis, 21 (77.8%) patients of metric level required Hemodialysis, 5 (26.31%) patients of intermediate level or more required Hemodialysis. Chi-square test was applied significant effect of educational status was observed (p-value 0.001) (Table 5).

Hemodialysis requirement as per types of Malaria

Frequency of Hemodialysis requirement was higher in plasmodium falciparum and plasmodium vivax as well, i.e. 21 (52.5%) and 14 (70%) respectively. Chi-square test was applied no significant effect of type of malaria was observed (p-value 0.195) (Table 6).

Table 1: Age of the patients n=60

Age of the patients (in years)	Mean	Standard deviation	Minimum	Maximum
	37.1	± 12.03	18	60

Table 2: Mean duration of symptoms n =60

Mean duration of symptoms (in days)	Mean	Standard deviation	Minimum	Maximum
	3.63	1.07	2	6

Table 3: Age groups and Hemodialysis requirement n=60

Age Groups (in years)	Hemodialysis Requirement		Total	P-value
	Yes	No		
≤ 30	7 (70)	3 (30)	10 (100)	0.325
> 30	28 (56)	22 (44)	50 (100)	
Total	35 (58.3)	25 (41.7)	60 (100)	

Number (%), applied chi square test

Table 4: Gender Distribution and Hemodialysis requirement n=60

Gender	Hemodialysis Requirement		Total	P-value
	Yes	No		
Male	12 (33.33)	24 (66.7)	36 (100)	0.001
Female	23 (95.8)	1 (4.2)	24 (100)	
Total	35 (58.3)	25 (41.7)	60 (100)	

Number (%),Chi-square test applied

Table 5: Educational Status and Hemodialysis Requirement n=60

Educational Status	Hemodialysis Requirement		Total	P-value
	Yes	No		
Illiterate	9 (64.3)	5 (35.7)	14 (100)	0.001
Metric	21 (77.8)	6 (22.2)	27 (100)	
≥Intermediate	5 (26.31)	14(73.68)	19 (100)	
Total	35 (58.3)	25(41.7)	60 (100)	

Table 6: Type of malaria and Hemodialysis Requirement n=60

Type of Malaria	Hemodialysis Requirement		Total	P-value
	Yes	No		
Plasmodium Falciparum	21 (52.5)	19 (47.5)	40 (100)	0.195
Plasmodium Vivax	14 (70)	6 (30)	20 (100)	
Total	35 (58.3)	25 (41.7)	60 (100)	

n(%),Chi-square test was applied

DISCUSSION:

Malaria associated acute kidney injury has become a major public health menace especially in tropical countries.

AKI caused by malarial infection has proven to be a significant contributor to the morbidity and mortality as it is one of the three most common cause of death

in patients with severe malaria, after cerebral malaria and septicemia.[3,4]

Incidence of ARF in malaria all over the world has been reported as 0.57% to 60%. In India, the incidence of malarial ARF has been reported to be 13% in North India, 17.8% in New Delhi and 17.2% in Orissa.

Mehta KS⁵ et al reported the prevalence of malarial AKI in south east Asia between 13 to 17.8%. Similarly Junejo AM and colleagues⁶ noted that malaria was responsible in 19.4% of AKI patients. In our study there were 40 (66.7%) patients with *Plasmodium falciparum* and 20 (33.3%) patients with *Plasmodium vivax*.

Similar result was found in a study in which out of total 402 malarial positive patients, *Plasmodium Falciparum* infection was seen in 147 patients (36.6%), *Plasmodium Vivax* in 219 (54.5%) and mixed infection in 36 (8.9%).^[5]

In a local study 46(19.4%) developed ARF due to *falciparum* malaria and 78.26% required dialysis.^[9] Mehta et al stated in their study that *Plasmodium Falciparum* was the commonest but *Plasmodium Vivax* was also found to be the cause of severe ARF.^[5]

There were 12 (33.33%) male patients who required Hemodialysis in this study while in female gender 23 (95.8%) patients required Hemodialysis. Chi-square test was applied and significant effect of age was observed (p-value 0.001).

According to a study twenty-four patients (5.9%, 19 males and 5 females) out of 402 had ARF and Peripheral Smear positive malaria. ^[5]

In age group ≤ 30 years Hemodialysis requirement was found in 7 (70%) patients in this study while in age group > 30 years 28 (56%) patients required Hemodialysis. Chi-square test was applied and no significant effect of age was observed (p-value 0.325).

In a study from India eighteen were in the age group 21- 40 years; three each in 41-60 and 60-80 years. *Plasmodium Falciparum* was the causative parasite in 16; *Plasmodium Vivax* (PV) in three and mixed infection was noted in five.^[5]

Hemodialysis required in 35 (58.3%) patients in this study. Our results matched with a study in which dialysis was found necessary in 22 (92%) patients.

All received Peritoneal Dialysis initially. 8 (36.36%) of these 22 had prolonged course lasting 2-6 weeks and received Hemodialysis subsequently.^[5]

Though Peritoneal Dialysis is less effective due to impaired microcirculation in severe malaria which is a hypercatabolic state, it was the more readily available mode to seriously ill and haemodynamically unstable patients.^[9]

CONCLUSION:

In this study the overall frequency of Hemodialysis requirement was higher in malarial patients with acute kidney injury.

REFERENCES:

1. Van biesen W, Vanholder R, Lamiere N. Defining acute renal failure: RIFLE and beyond. *Clin j amsocnephrol.* 2006;1:1314-9.
2. Das BS. Renal failure in malaria. *J vector borne dis.* 2008;45:83-97.
3. Lombardi R, Zampedri MD, Rodriguez I, Alegre S, Ursu M, di Fabio M. Prognosis in acute renal failure of septic origin: a multivariate analysis. *Renal failure.* 1998;20:725-32.
4. White NJ, Looareesuwan S. Cerebral malaria. Kenedy PGE, Johnson RT, eds. *Infections of the nervous system.* London: butterworths, 1987;10:118-44.
5. Mehta KS, Halankarar, Makwanapd, Torane PP, Satijaps, Shah VB. Severe acute renal failure in malaria. *J postgrad med.* 2001;47:24-6.
6. Junejo AM, Ali H, Lal M. Acute renal failure associated with malaria. *J Ayub Med Coll.* 2006;18;4:47-52.
7. World health organization. Severe *falciparum* malaria. *Trans r soc trop med hyg.* 2000;94:s1-s90.
8. Prakash J, Gupta A, Kumar O, Rout SB, Malhotra V, Srivastava PK. Acute renal failure in *falciparum* malaria-increasing prevalence in some areas of india- a need for awareness. *Nephrol dial transplant.* 1996;11:2414-6.
9. Ozen M, Gungor S, Atambay M, Daldal N. Cerebral malaria owing to *Plasmodium vivax*: case report. *Ann Trop Paediatr.* 2006;26:141-4.