

Short Communication

Medicine Science 2017;6(2):355-6

Malarial acute kidney injury**Midhun Ramesh¹, Balu Mohan², Praveen Murlidharan³, Satish Balan³**¹ Department of Nephrology, P.B.No 1, Kerala Institute of Medical Sciences, Anayara P. O, Trivandrum, Kerala, India² Department of Medicine, P.B.No 1, Kerala Institute of Medical Sciences, Anayara P. O, Trivandrum, Kerala, India³ Department of Nephrology, P.B.No 1, Kerala Institute of Medical Sciences, Anayara P. O, Trivandrum, Kerala, India

Received 28 September 2016; Accepted 06 December 2016

Available online 22.12.2016 with doi: 10.5455/medscience.2016.05.8569

Abstract

Malaria is one among the top killer infectious diseases in the World. It is a parasitic disease of epidemiological importance in tropical countries and Malaria associated Acute Kidney Injury (MAKI) is emerging as a big Nephrological issue. We conducted a retrospective descriptive study to determine the demographic profile, incidence, clinical feature and outcome of acute kidney injury (AKI) due to Malaria in our institution from January 2010 to December 2014. Out of 138 Malaria positive cases admitted in our institution, the incidence of AKI was 15.7 % (21). The main presenting features were fever (95.23%), jaundice (23.8%), vomiting (23.8%) and shortness of breath (14.28%) in cases with MAKI. 9.5 % (13) of cases MAKI required some form of Renal Replacement Therapy (RRT). Two patients were managed with Sustained Low Efficiency Dialysis (SLED) and 11 with Intermittent Haemodialysis (IHD). The prognosis of AKI in Malaria is favourable with high quality intensive care, early diagnosis, prompt initiation of antimalarial therapy and RRTs in indicated cases.

Keywords: Malaria, acute, kidney injury**Introduction**

Malaria is one among the top killer infectious diseases in the World. It is a parasitic disease of epidemiological importance in tropical countries. Malaria associated Acute Kidney Injury (MAKI) is emerging as a real nephrological concern. The exact mechanism of MAKI is still unknown. The pathogenesis of renal failure in Malaria may be related to red blood cell (RBC) sequestration interfering with microcirculatory flow in Kidneys, impairing renal metabolism [1,2]. Immune mediated glomerular pathology has also been postulated [1]. Other contributory factors include hypovolemia, hypotension and haemolysis-which results in heme pigment nephropathy [3]. Incidence of MAKI is higher in adult population when compared to paediatric age group [4]. Renal involvement in malaria may manifest in two different forms 1) a chronic progressive Malarial glomerulopathy and 2) MAKI [1].

We conducted an observational study to determine the demographic profile, incidence, clinical feature and outcome of AKI due to Malaria in our institution. This study was a retrospective analysis of all cases of Malaria Nephropathy admitted to our hospital over four years study period from January 2010 to December 2014.

Material and Methods

All cases of either smear positive or Rapid Malaria Test (RMT) positive for Malaria with Acute Kidney Injury (AKI) was included in the study. Patients with pre-existing renal disease, documented cases of chronic Kidney diseases and mixed viral, bacterial or parasitic diseases were excluded from the study. AKI was defined as an [1] increase in serum creatinine by 0.3 mg/dl or more within 48 hours of admission or [2] increase in serum creatinine levels above 1.5 times of baseline value within 7 days or [3] urine output less than 0.5ml/kg/ hour for six hours [5]. The data on their mode of presentation, lab parameters, clinical course, treatment modalities offered and outcome was analysed using SPSS (Statistical Package for Social Sciences) version 16.0 software. Results were expressed as percentages, mean, range and standard deviation

Out of 138 Malaria positive cases the incidence of AKI was 15.7 % (21), P. Falciparum 7 (33.33%); P. Vivax 4 (19.01 %) and four (19.01 %) cases of mixed infection were related to MAKI. Plasmodium species was not identified with cent percent certainty in 28.5% (6) of cases. The male to female ratio was 18:3 with mean age 40 years. Maximum number of cases was in the month July when this region experiences the Monsoon season. There was a progressive rise in incidence of MAKI from 15 % to 27% over a period of four years. The main presenting features were fever (95.23%), jaundice (23.8%), vomiting (23.8%) and shortness of breath (14.28%) among MAKI cases. The

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most common age group affected was males between 30 to 40 years. Five cases (23.80%) showed severe AKI (Serum creatinine >5 mg/dl). 61.90 % (13) of cases MAKI required some form of Renal replacement therapy (RRT). Two patients were managed with Sustained low efficiency dialysis (SLED) and 11 with intermittent Haemodialysis (IHD). Mean number dialysis session was 2.46 per patient. Non-oliguric renal failure was seen in most of the cases. Average length of hospital stay for MAKI cases was 5.86 days. All our cases recovered completely without sequel and were discharged to home.

Table 1. Baseline Characteristics

Variables	Mean $\pm$ SD
Age	40 $\pm$ 14 years
Systolic BP	108.66 $\pm$ 14.31 mm of Hg
Diastolic BP	72.38 $\pm$ 9.437 mm of Hg
Total Leukocyte count	6933.33 $\pm$ 3700/ cu mm
Hemoglobin	11.11 $\pm$ 2.61 g/dl
Serum C-Reactive Protein	152.98 $\pm$ 67 mg/L
Platelet Count	64914.28 $\pm$ 44940/ cu mm
Serum Bilirubin	7.13 $\pm$ 9.17 mg/dl
AST	61.28 $\pm$ 46.05 IU/l
ALT	59.95 $\pm$ 33.44 IU/l
Serum Sodium	132.47 $\pm$ 4.9 mEq/dl
Serum Potassium	4.44 $\pm$ 0.7 mEq/dl
Serum Creatinine	3.44 $\pm$ 2.90 mg/dl
Blood Urea Nitrogen	53.04 $\pm$ 38.32 mg/dl

Table 2. Results

Parameter	Number of Cases
Malaria associated Acute Kidney Injury	21
Fever	20 (95.23%)
Jaundice	5 (23.8%)
Vomiting	5 (23.8%)
Shortness of Breath	3 (14.28%)
Sustained low efficiency dialysis (SLED)	2 (9.52%)
Intermittent Haemodialysis (IHD)	11 (52.38%)
Survived	21 (100%)

Conclusions

Reported incidence of AKI in Malaria is highly variable between 5-48% with a mortality of 15 to 45%. [1,2] P. Vivax, P. Malaria & P. Falciparum can cause ARF. The prognosis of AKI in Malaria is favourable with high quality intensive care, early diagnosis, prompt initiation of antimalarial therapy, avoidance of nephrotoxic medications and RRTs in indicated cases.

Acknowledgment

We acknowledge the administrative help rented from Mr Manoj M.T, Manager and Chief Social Worker, Society for Continuing Medical Education and Research (SOCOMER), KIMS, Trivandrum; during the process of this research.

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