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Poor Prognosis Factors of Severe Malaria in Antananarivo, Madagascar

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ABSTRACT

INTRODUCTION & AIM: Malaria is a major health problem in our country. Our aim is to determine the poor prognosis factors of this pathology.
MATERIALS AND METHOD: A retrospective descriptive, analytical study was conducted in the intensive care unit of University Hospital Center of Joseph Raseta Befelatanana, during 24 months (June 2015 to May 2017). The severity was defined according to the recommendations for clinical practice (2007). We compared surviving and non-surviving patients.
RESULTS: Fifty-six (56) cases were studied. The average age was 30 ± 11 years with a sex ratio of 6. Six cases had pulmonary disease. Neurological failure was present in 29 cases. Forty-seven cases were treated with quinine and 07 cases received norepinephrine. The length of stay was 3.55 ± 2.06 days. Eighteen subjects (32%) died. In multivariate analysis, neurological failure (p = 0.0001), jaundice (p = 0.0016), renal insufficiency (p <0.0001) and use of catecholamine (p = 0.0139) were associated with poor prognosis.
CONCLUSION: The mortality of malaria was high. Neurological failure, jaundice, renal insufficiency and use of catecholamine were poor prognostic factors.

KEYWORDS: Intensive Care Unit, Mortality, Poor Prognosis Factors, Severe Malaria

INTRODUCTION

Malaria is a major public health problem in endemic tropical regions. It affected 212 million new people and caused 429,000 deaths in 2015 in the world.[1] The mortality in developed countries was low. The neurological failure, acute respiratory distress syndrome and mechanical ventilation[2], age, and hyperparasitaemia[3] were the factors associated with mortality. But in Africa, the mortality was around 16 to 32%.[4,5] Age > 65 years, coma, seizures, macroscopic hemoglobinuria[5] and cardiogenic shock were the poor prognostic factors.[5] Our aim is to determine the factors of poor prognosis of this disease.

MATERIALS AND METHOD

This is an analytical descriptive retrospective study conducted over a period of 24 months (June 2015 to May 2017). It was performed in Intensive Care Unit of University Hospital Center of Joseph Raseta Befelatanana.

Patients' inclusion criteria was: 18 years of age, those who were diagnosed and tested positive for Plasmodium by peripheral blood smears, quantitative buffy coat test, had one or more criteria of severe malaria as per the Recommendations for clinical practice (2007).[6]

Variables included age, gender, comorbid condition, severe malaria severity criteria's, treatment, the duration of hospitalisation and mortality.

The study was reviewed and approved by the Ethical Review Board of the Medical Intensive Care Unit of the University Hospital Center of Joseph Raseta Befelatanana. Data were collected and entered in Microsoft Excel 2016. Continuous variables were represented by mean and standard deviation, and categorical variables were represented by number and frequency. The t-student test was used to analyse continuous variables and chi-square test for analysis of categorical variable. The p value was considered as significant if less than 0.05.

RESULT

A total of 56 patients were reviewed. The mean age was 30 ± 11 years. Out of the total subjects, 48 were males. Sex ratio was found to be 6. A total of 06 cases had respiratory comorbidities.

Twenty nine (52%) developed neurological failure. The circulatory failure and jaundice were observed in 17 (30%) and 16 (29%) cases respectively. Severe anaemia was present in 14 (25%) cases, 5(9%) cases had

hyperparasitaemia.

47 (84%) patients received quinine. Twelve (21%) cases were given norepinephrine. The average length of ICU stay was 3.55 ± 2.07 days. The mortality proportion was 32% (18 cases). (Table 1)

VARIABLES	RESULTS
Age (years)	30 ± 11
Male / female gender	48/8
Comorbidities conditions	
None	46 (82)
Cardiovascular and metabolic	2 (4)
Respiratory	6 (11)
Severity criteria of malaria[6]	
Neurological failure	29 (52)
Cardio-circulatory failure	17 (30)
Respiratory failure	12 (21)
Jaundice	14 (25)
Renal insufficiency	9 (16)
Repeated convulsions	14 (25)
Haemorrhage	10 (18)
Severe anaemia	14 (25)
Hypoglycemia	4 (7)
Hyperparasitaemia	5 (9)
Quinine / artesunate	47 (84) / 9 (16)
Dialysis	0 (0)
Mechanical ventilation	0 (0)
Duration of hospitalisation	18 (32)
Mortality (days)	3.55 ± 2.07

Table 1. Clinical & Microbiological Characteristics and Treatment of Severe Malaria

In multivariate analysis, neurological failure, jaundice, renal insufficiency and use of catecholamine were factors associated with poor prognosis (Table 2).

DISCUSSION

In this study, neurological failure was by far the most common. The mortality proportion was 32%. Neurological failure, jaundice, renal insufficiency and use of catecholamine represented as mortality risk factors.

The mortality proportion was 32%: 16 to 33% in Africa[4,5,7], low in India[8,9] and developed country[2,3,10,11]. This difference could be explained by the untimely diagnosis and treatment of patients.[12] All patients were transferred from rural endemic regions to the hospital. The neurological failure was the most common sign[3,5,7,13] and was among the factors of poor prognosis: a result confirmed by the literature.[3,9,13]

Jaundice has been reported as a risk factor: result confirmed by literature.[13,14] It is due to liver dysfunction[11] and lysis of red blood cells.

The renal insufficiency was observed as a factor of poor prognosis: a result confirmed by some authors.[5,9,11] None of our patients underwent haemodialysis because they had no money. The haemodialysis rate varied from 10 to 35% in the literature,[3,9-11] with acute renal failure in 48% of subjects.[9,15] The lack of dialysis increased death rate.[16] The aetiology was multifactorial including hypovolemia, disseminated intravascular coagulation, haemolysis and hyperbilirubinemia.[17]

The use of amines was a risk factor associated with mortality and consistent with other reported series.[3,4,9]

This retrospective study predicted the poor factors associated with death in severe malaria. It was the first study conducted in a medical ICU of Madagascar. Despite the small sample size, it did not predict the overall assessment of the Malagasy population in intensive care.

CONCLUSION

The morbidity and mortality of malaria remains a major problem in tropical countries. No study evaluated factors associated with poor prognosis in Madagascar. Mortality remains high in our study with factors associated with poor prognosis such as jaundice, neurological failure, use of catecholamine and renal insufficiency.

VARIABLES	PATIENTS SURVIVORS (N = 38)	PATIENTS NON SURVIVORS (n= 18)	p-VALUE
Age	29 ± 11	31 ± 12	.5151
Male gender	32	16	.6055
Cardio-circulatory failure	9	8	0.0777
Neurological failure	**13**	**16**	**0.0001**
Jaundice	**6**	**10**	**0.0016**
Renal insufficiency	**2**	**7**	**<0.0001**
Repeated convulsions	8	6	.2486
Haemorrhage	5	5	.1922
Severe anaemia	10	5	.5921
Hypoglycemia	3	1	.4532
Quinine	31	16	.6290
Catecholamine	**2**	**5**	**0.0013**

Table 2. Poor Prognostic Factors of Severe Malaria

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