FREQUENCY OF BACTERIAL CO-INFECTION IN PATIENTS WITH MALARIA

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ABSTRACT

Objective: To determine the frequency of concomitant bacterial infection in patients with malaria.

Material and methods: This descriptive cross-sectional study was conducted at Department of Medicine, Hayatabad Medical Complex, Peshawar. After informed consent, a total of 179 patients with malaria were included using consecutive sampling technique Patients who have had antibiotic treatment in the last 72 hours were not included in the study.

Using aseptic technique, 10 ml blood was collected from the study participants in aerobic blood culture bottle and was submitted in microbiology laboratory for bacterial culture. All patients received standard treatment for malaria. Admitted patients were informed about result of their blood culture in person in ward, and outpatients were informed on follow up visit after 3 days. Those with growth of pathogenic bacteria on blood culture, if not already on antibiotic, were advised antibiotic treatment. Demographic parameters and result of blood culture were recorded on predesigned proforma. Data was analyzed using SPSS version 17. Descriptive statistics were performed for age, gender and result of bacterial culture. Results were presented as tables.

Results: The mean age of study population was 34.77±10.85 years, with male predominance (69.8%). 5.6 % (10/179) patients with malaria had bacterial growth of on blood culture.

Conclusion: Failure to improve with optimum antimalarial therapy shall raise suspicion of concomitant/superadded bacterial infection and further work up shall be considered in such cases.

INTRODUCTION

Malaria is endemic in over hundred countries, making it a significant public health problem. Around 2.6 billion people are vulnerable to get Plasmodium vivax (p. vivax) malaria, with 130-435 million projected to get infected with P. vivax infection annually.[1]

Half of the world's population is at risk from malaria. n 2018, an estimated 228 million cases of malaria occurred worldwide. Most malaria cases in 2018 were in the World Health Organization (WHO) African Region (213 million or 93%), followed by the WHO South-East Asia Region. In 2018, there were an estimated 405 000 deaths from malaria globally.[2]

Researchers have focused on concomitant bacterial infection in patients with malaria. Majority of these studies have been carried out in Africa where malaria is endemic. Prevalence of bacterial infections ranging from 4.6 to 11.7% in children.[3-6] and 0.5 to 14.3% in adults has been reported.[7-9] Other studies on patients with malaria have found the prevalence of invasive bacterial infection of 0.3 % and 24 to 30% in Sweden and Switzerland, respectively.[10,11] Regionally, authors from India have reported prevalence of bacterial infection in adult patients with malaria between 1.3 to 6.7%.[12-14]

The presence of bacterial co-infection in a patient with malaria has implications for management of these patients. These patients may have persistent fever after adequate treatment for malaria and may be mismanaged as cases of anti-malarial resistance. Early diagnosis with blood culture and treatment with appropriate antibiotics will decrease their morbidity and mortality. The purpose of this study was to generate local evidence in this regard. The results may help in developing local protocol about screening patients with malaria for concomitant bacterial infection.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted at Department of Medicine, Hayatabad Medical Complex, Peshawar. After informed consent, a total of 179 patients with malaria were included using consecutive sampling technique during the study period of 10 months. The diagnosis of malaria was based in demonstration of malarial parasite on thick and/or thin smear. Patients who have had antibiotic treatment in the last 72 hours were not included in the study.

Using aseptic technique, 10 ml blood was collected from the study participants in aerobic blood culture

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Demographic parameters and result of blood culture were recorded on predesigned proforma. Data was analyzed using SPSS version 17. Descriptive statistics were performed for age, gender and result of bacterial culture. Results were presented as tables.

RESULTS

Out of total 179 patients, 125 (69.8%) were male. The mean age of study population was 34.77±10.85 years. Demographic parameters of study population are outlined in table 1. 10 (5.6 %) out of 179 patients had bacterial growth of on blood culture. (Table 2)

Table 1: Demographic parameters of study population (n=179)

Age in years, (Mean ± SD)	34.77±10.85
Age groups	
16-25 years, No. (%)	54 (30.1%)
26-35 years, No. (%)	64 (35.8%)
Above 35 years, No. (%)	61 (34.1%)
Gender	
Male, No. (%)	125 (69.8%)
Female, No. (%)	54 (30.2%)

Table 2: Frequency of positive blood culture

Bacterial culture	No.	%
Positive	10	5.6 %
Negative	169	94.4 %
Total	179	100%

DISCUSSION

Malaria is endemic in our part of the world and often present with fever without other focal symptoms and signs. Certain bacterial infections like salmonellosis can present in the same way. Researchers have documented blood stream bacterial infections in patients with children and adults with malaria.[3-5,8,10,13] particularly in areas of holoendemic malaria transmission, are largely unexplored, blood cultures and comprehensive clinical, laboratory, hematological, and nutritional parameters for malaria-infected children (aged 1 to 36 months, n = 585 patients

In this study, 5.6% of patients with malaria had systemic bacterial infection documented through a positive blood culture. Investigators from Africa and India have reported similar prevalence of bacterial infection.[3-6,13,15]particularly in areas of holoendemic malaria transmission, are largely unexplored, blood cultures and comprehensive clinical, laboratory, hematological, and nutritional parameters for malaria-infected children (aged 1 to 36 months, n = 585 patients Findings of this study are in contrast with those reported by Nwuzo et al.[7] and Mbuh et al.[8] from Africa who have reported very low rate of positive bacterial cultures in patients with malaria. The divergence may be due to the fact that they have reported growth of salmonella only. Similarly, this study has reported higher prevalence of bacterial infection in malaria patients as compared to those reported by Pattanaik et al.[14] from India. This disagreement may be because of difference in the study population as they have included non-severe cases of malaria. In the same manner, our prevalence is higher than that reported from Sweden (0.3%)[10] where they have studied returning travelers with malaria.

A Study from Nigeria[9] has reported higher prevalence (14.4%)of bacterial infection than this study. This may be due to differences in study population with regard to genetics, endemicity of salmonella and hygienic conditions. Similarly, authors from Switzerland-[11]between one and three malaria-associated deaths occur annually in Switzerland. In this retrospective study, 33 deaths (25 men and 8 women have observed the prevalence of bacterial co-infections up to 24 – 30%. But they have studies only patients admitted in intensive care who are anyways at higher risk of acquiring bacterial infections.

CONCLUSIONS

Malaria is endemic in Pakistan and is one of the most common differential diagnoses in patients presenting with fever without localizing symptoms and signs. Lack of response to adequate antimalarial therapy shall raise suspicion of concomitant/superadded bacterial infection and further work up shall be considered in such cases.

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