

Association of Electrolyte Disturbances with the Type and Severity of the Malarial Parasitic Infection

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Background and Objective

Malaria is a life-threatening disease which is caused by malaria parasite. It is a major public health problem in India. The purpose of this study was to examine the possible changes in the serum electrolytes (Na⁺ and K⁺) in 915 cases of malaria, on the basis of their severity as compared to 199 volunteer control subjects.

Aim

The aim of this study was to determine the severity of hyponatraemia and hypokalaemia (if present) and their association with the severity of malaria in a large cohort of known patients of malaria, as compared to that in a cohort of control subjects.

Material and Methods

The serum sodium and serum potassium levels were analyzed in three cohorts, each comprising 411 diagnosed cases of *P. Vivax*, 394 diagnosed cases of Non severe *P. Falciparum* and 110 diagnosed cases of Severe *P. Falciparum*, thus a total of 915 cases, in a tertiary care hospital in Vadodara, Gujarat, India. The patients were divided into these categories on the basis of the WHO guidelines and criteria. 199 control subjects were also enrolled and their serum electrolyte levels were analysed and compared with that of malaria cases.

Statistical Analysis

The data from the study were analyzed separately by using the Statistical Package for Social Sciences. The results were presented as Mean \pm SD. A p value of <0.05 were considered to be significant.

Results

On admission, serum concentrations of sodium (135-145 m.mol/L) and potassium (3.5-5.0 m.mol/l) were found outside these reference ranges in 50.5%(480) and 49.73%(455) of patients respectively. Severe hypokalaemia (K⁺ <3.0 mmol/L) and severe hyponatraemia (Na⁺ <125 mmol/L) occurred in 5.57%(51) and 23.06%(211) of the patients, respectively. Mean sodium and potassium levels as observed in malaria patients was 134.1 (± 5.72) and 3.66 (± 0.77) respectively, while in control subjects (199) values observed were 137.4 (± 3.88) and 3.7 (± 0.42). Severe *P. falciparum* subjects had mean Sodium and Potassium levels of 131.3(± 6.21) m.mol/l and 3.74(± 0.91)m.mol/l respectively.

Conclusion

Hyponatraemia and Hypokalaemia are common in malaria and they are associated with severity of the disease. Hyponatremia was associated most commonly with *P. falciparum* while Hypokalemia was most commonly associated with *P. vivax* infection. Correction of the electrolyte imbalance in the severe cases is of great significance in the management of the patients.