



AN ASSOCIATION BETWEEN IONIZED CALCIUM LEVEL AND SEVERITY OF DENGUE FEVER

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ABSTRACT

Background: Dengue fever is a major public health problem in tropical countries and is associated with significant morbidity and mortality due to its unpredictable clinical course. Early identification of patients at risk of developing severe dengue remains a clinical challenge. Electrolyte disturbances, particularly hypocalcemia, have been increasingly recognized in dengue infection. Ionized calcium represents the physiologically active fraction of serum calcium and may better reflect disease severity than total serum calcium.

Aim: To assess the association between serum ionized calcium levels and the severity of dengue fever.

Objectives: To estimate ionized calcium levels in patients with dengue fever, to classify dengue severity according to WHO 2009 criteria, and to evaluate the association between ionized calcium levels and clinical as well as laboratory indicators of disease severity.

METHODS

This prospective observational study was conducted in Karaikal, from July 2025 to December 2025. Fifty adult patients with laboratory-confirmed dengue fever (NS1 antigen and/or IgM ELISA positive) were enrolled. Patients were classified into dengue without warning signs, dengue with warning signs, and severe dengue based on WHO 2009 guidelines. Serum ionized calcium levels were measured using the ion-selective electrode method.

Clinical features, platelet count, hematocrit, and other laboratory parameters were recorded. Statistical analysis was performed using SPSS software, with a p-value <0.05 considered significant.

RESULTS

Out of 50 patients, 36% had dengue without warning signs, 40% had dengue with warning signs, and 24% had severe dengue. The mean ionized calcium level was significantly lower in patients with severe dengue compared to those with non-severe dengue. Hypocalcemia was more prevalent among patients with bleeding manifestations, hypotension, and shock. A significant positive correlation was observed between ionized calcium levels and platelet count, while a negative correlation was noted with hematocrit levels, indicating greater plasma leakage in patients with lower ionized calcium levels.

CONCLUSION

Serum ionized calcium levels show a significant association with the severity of dengue fever. Ionized hypocalcemia is more common in severe dengue and correlates with adverse clinical and laboratory parameters. Measurement of ionized calcium is a simple, cost-effective investigation



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that may aid in early risk stratification and management of dengue patients, especially in

resource-limited settings.

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