



ASSOCIATION OF DENGUE SEROLOGICAL MARKERS AND PLATELET COUNT IN THE EARLY RECOGNITION OF DENGUE INFECTION IN PEDIATRIC PATIENTS IN A TERTIARY GOVERNMENT HOSPITAL

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BACKGROUND

One of the mainstay in diagnosing dengue is the positive result of dengue NS1 antigen, which is highly specific during the 1st day of illness. IgM antibodies are detectable on days 3 to 5 or more after the onset of illness and are variable. A positive result is considered a recent dengue infection. Whereas IgG appear later and persist for life. Thrombocytopenia serves as a predictive marker and promotes early diagnosis of dengue infection.

OBJECTIVES

This study aims to determine association of dengue serological markers and platelet count in early diagnosis of dengue infection in pediatric patients in a tertiary hospital

METHODS

Medical records and laboratory results of patients diagnosed with dengue infection from January 2022 to December 2022 were retrieved and reviewed. A total of 233 dengue cases were included in this study, where their serum samples were collected and tested for dengue NS1 antigen, IgM, and IgG antibodies, using the immunochromatographic kit. The platelet count of all cases were recorded, irrespective of positive or negative results of the rapid diagnostic test. The statistical analysis was performed using SPSS software. Chi-square test for independence was used for the comparison of categorical data.

RESULTS

Table 2. Comparison of Dengue Serological Markers in Diagnosing Dengue Infection

Serological Marker Present	Total	Percentage (%)
NS1 only	66	28.3
IgM only	5	2.1
IgG only	21	9.0
NS1 + IgM only	34	14.6
NS1 + IgG only	16	6.9
IgM + IgG only	44	18.9
NS1 + IgM + IgG	47	20.2
Total	233	100.0

Since dengue NS1 antigen is detected for the early course of illness and if not included in the test panel, we would have missed on early diagnosing 28.3% of cases in this study.

Table 3. Dengue Serological Markers and Platelet Count of Dengue Patients (n=233)

Serological Marker Present	No. of Patients	No. of Patients with Platelet Count < 100,000/cumm	Percentage (%)
NS1 only	66	25	37.9
IgM only	5	2	40.0
IgG only	21	12	57.1
NS1 + IgM only	34	10	29.4
NS1 + IgG only	16	9	56.3
IgM + IgG only	44	27	61.4
NS1 + IgM + IgG	47	30	63.8
Total	233	115	49.4

An association between dengue serological markers and thrombocytopenia was found to be statistically significant.

Data shows. Hence, clinicians should be cautious when patients are positive in IgG antibodies since these cases may present thrombocytopenia that could lead to disease progression.

CONCLUSION

Immunochromatographic test is the mainstay approach in diagnosing dengue infection. However, dengue antibodies take nearly one week to appear, therefore, antigen detection is the means of early diagnosis of dengue infection.

Association of thrombocytopenia in dengue serological cases was found to be highly significant.

Hence, detection during the acute phase is crucial and would aid in efficient and prompt management.

RECOMMENDATION

- To include the history of previous dengue infection
- To include all diagnosed dengue patients
- For further studies, correlation and quantifying the risk of thrombocytopenia and severity of illness in patients presented with various serological markers

REFERENCES

CDC. Dengue Virus Antigen Detection. 2023; Philippine Star Global. Philippines logs 220,705 dengue cases in 2022; WHO Dengue Guidelines for Diagnosis, Treatment, Prevention and Control 2009; Blacksell, et al., Evaluation of Six Commercial Point-of-Care Tests for Diagnosis of Acute Dengue Infections: The Need for Combining NS1 Antigen and IgM/IgG Antibody Detection to Achieve Acceptable Levels of Accuracy. 2011; WHO Global Strategy for Dengue Prevention and Control. 2012 to 2022; Ingale, et al., Correlation of Serological Markers and Thrombocytopenia in Early Diagnosis of Dengue Infection. 2018; Sa-ngarnsang, et al., Accuracy of Dengue Clinical Diagnosis with and Without NS1 Antigen Rapid Test: Comparison Between Human and Bayesian Network Model Decision. 2018; Wang SM, et al., Early Diagnosis of Dengue Infection Using a Commercial Dengue Duo Rapid Test Kit for the Detection of NS1, IgM, and IgG. 2010; Pachori, et al., A Study of Correlation Between Dengue Serological Markers and Platelet Count in Almer Region. 2022; Ruiz, et al., Improving Dengue Diagnosis and Case Confirmation in Children by Combining Rapid Diagnostic Tests, Clinical, and Laboratory Variables. 2023; Kleigman, et al., Nelson Textbook of Pediatrics. 2020; Jyothi P, et al., Correlation of Serological Markers and Platelet Count in the Diagnosis of Dengue Virus Infection. 2015; Kulkarni, et al., Association of Platelet Count and Serological Markers of Dengue Infection- Importance of NS1 Antigen. 2011; Faridah, et al., Dynamic Changes of Platelet and Factors Related Dengue Haemorrhagic Fever: A Retrospective Study in Indonesian. 2022; Nayak, et al., Paradigm Shift in Socio-Demographic Profile of Dengue Infection: A Hospital Based Cross-Sectional Study. 2021; Tsheten, et al., Clinical Predictors of Severe Dengue: A Systematic Review And Meta-Analysis. 2021



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