

Bedside Severity Prediction Score for Predicting Severe Dengue in Children: A Shot in the Arm for Triage Dengue Positive Children?

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Dengue has emerged as the most widespread and rapidly increasing vector-borne disease in the world [1]. About half of the world population is at risk of dengue with 100-400 million infections being reported each year [2]. India is one of the 30 most highly dengue endemic countries with outbreaks occurring in post monsoon season all over the country [3]. Though severe disease occurs only in a small proportion of dengue cases, delay in their recognition can result in significant morbidity and even mortality [4]. Identifying these patients at risk of severe disease is helpful not only in reducing mortality, but also in reducing burden on the already strained healthcare systems by triaging such cases and directing more manpower and resources for their management.

The work by Gayatri, et al. [5] published in this issue of *Indian Pediatrics*, provides a bedside severity score for predicting severe dengue in children. The authors have developed a model to predict the occurrence of severe dengue from a retrospective analysis of data from 125 children admitted with dengue in their hospital. They have then validated the model prospectively on 312 children with diagnosis of dengue. Children between 2 months and 12 years of age with confirmed dengue virus infection (NS1Ag and/or IgM ELISA positive) were enrolled in this study. Children co-infected with other tropical infections or having another proven focus of infection were excluded from the study. Fourteen risk factors as given in the National Dengue Guideline 2020 were taken to develop the risk score. Three characteristics, narrow pulse pressure (≤ 20 mm Hg in absence of shock), mucosal bleed and clinical or radiologic evidence of third space fluid loss were predictive of severe disease among the 125 children. Using canonical discriminant function for these three variables a scoring equation was calculated: A score nearer to 2.913 was associated with severe disease while scores closer to -1.056 was associated with non-severe disease. This score was then validated prospectively on 312 dengue positive children. The

score was able to identify severe dengue with 86.7% sensitivity and 98.25% specificity and 95.2% overall predictive accuracy. Thirteen children were classified as non-severe dengue but were later observed to have severe disease, while four children were observed to have non-severe disease despite being predicted to have severe dengue. Case fatality rate was 2.5% among the prospectively enrolled children.

The score developed by Gayatri, et al. [5] is probably the only dengue severity prediction score for children that uses only bedside parameters [6,7]. Since laboratory investigations are not a part of this score, this tool will be useful in triaging children at point of contact for risk of severe disease. This can enable early referral in places where intensive monitoring and management are not feasible and also identify patients that require more intensive monitoring in places that can manage sick patients.

One important limitation of this scoring system, as acknowledged by the authors, is the need for a point of care ultrasound. Availability of ultrasound machines and trained personnel to use them may not be equally distributed in dengue endemic regions around the world. Also, the dynamic nature of dengue illness may require calculating the score multiple times during the course of the disease. This may be a hindrance in adhering to a scoring system, especially in health care settings with high patient load and limited human resources. Further studies in different health care settings would help increase the generalisability of the score and bring to light the issues that one might face while using the score at these different settings and provide ideas to strengthen this dengue severity prediction score.

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