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Comparison of Alert-Verbal-Painful-Unresponsiveness Scale and the Glasgow Coma Score

To determine how the AVPU (alert, verbal, painful, unresponsiveness) scale corresponds to Glasgow Coma Score (GCS), we compared the two scales. Two months to 12 years old patients were included in the study. The median GCS score (inter quartile range) for A/V/P/U were 14 (12-15), 11 (10-12), 6 (5.5-8) and 3 (3-4), respectively.

Key words. AVPU, GCS / modified GCS, Pediatrics, PICU.

Assessment of level of consciousness forms a crucial component of the evaluation of sick children [1]. The Glasgow Coma Scale (GCS) score is one of the most commonly used methods [2-7]. The Alert Verbal Painful Unresponsiveness (AVPU) scale is a simpler method of assessment of consciousness [8]. The two scales have been compared in 3 adult studies [1,3,8]. They have not been compared in pediatric intensive care patients. We conducted this study to determine how the AVPU responsive scale corresponds with the GCS in children admitted to a pediatric intensive care unit.

This was a prospective cohort study. Children with poisoning and children who had received anticonvulsants or sedation were excluded. The pediatric registrar assessed the consciousness level at admission using the 2 scales. Pre-verbal children were assessed on the modified GCS score. Assuming the difference in mean GCS score was characterized by a variance of means of 5.5 and assuming that the common SD was 4, it was determined that at least 11 readings in each AVPU score would be needed for a one way ANOVA with 90% power to detect significance at 5% level. Accordingly the study was continued till a minimum of 11 patients were enrolled in each of the 4 categories A/V/P/U. The GCS and AVPU readings of each patient were compared. The median GCS score for each AVPU component was determined and a one way analysis of variance technique was employed. Bonferroni correlation was used for multiple comparisons.

159 patients (mean age 18 months) were enrolled to meet the sample size stipulation. Out of the total 159 cases, 99 (67%) were alert, 12 (7.55%) were responsive to voice, 37 (23.27%) were only responsive to painful stimuli and 11 (6.92%) were unresponsive.

Comparison between GCS/modified GCS and AVPU scores are shown in **Figure 1**. Those who

responded to pain had a median GCS score of 6 with IQR 5.5-8. Unresponsive patients had median GCS score of 3 with IQR 3-4. One-way analysis of variance indicated that all the components of AVPU had significantly different average GCS scores ($P < 0.001$). Bonferroni corrected multiple comparisons indicated no two components are similar with respect to the GCS score.

Our data would suggest that A/V/P/U corresponds with median GCS score of 14 (12-15), 11 (10-12), 6 (5.5-8) and 3 (3-4), respectively. As may be expected, there is some overlap between the range of GCS score corresponding to each AVPU responsive scale category but our IQRs are distinct from each. Another study in adults have previously shown similar results, and the corresponding scores in adults were 15, 12, 8 and 3 [9]. The good correlation seen in our study suggests that there is a constant relationship between these two scores in pediatric patients.

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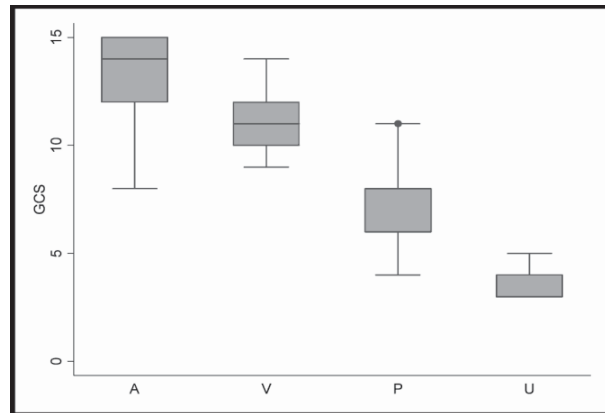


FIG. 1 Box-and-whisker plot showing median GCS scores for the AVPU responsive scale. The boxes represent the IQR; the whisker represent the range.

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