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**Serial single breath count is a reliable tool for monitoring respiratory functions in Guillain-Barré Syndrome**

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Patients with Guillain-Barre syndrome (GBS) having respiratory involvement needs close monitoring. Repeated spirometry and arterial blood gas (ABG) analysis may not be feasible and cost effective. Single breath count (SBC) is a convenient indicator of respiratory reserve, but there is no study correlating SBC with ABG parameters. In this study, we correlate SBC with arterial blood gas (ABG) parameters to derive a cutoff point beyond which repeated ABG is required for intubation and mechanical ventilation (MV). This prospective cohort study was done during January 2015 – July 2017 at a tertiary care teaching hospital in India. One hundred twelve patients with GBS were assessed; 18 of them did not meet the inclusion criteria and were excluded. Ninety-four patients underwent serial SBC at 2 Hz using an audio programme in a smart phone. ABG was done at admission and repeated if SBC declined. The patients were intubated based on ABG evidence of hypoxia ( $\text{PaO}_2 < 60$  mm of Hg on ventimask), hypercarbia ( $\text{PaCO}_2 > 50$  mm of Hg) or acidosis ( $\text{pH} < 7.3$ ). All the patients received standard care. The primary outcome was the absolute SBC at which patients had ABG alteration needing intubation. The secondary outcome measures were death and complications during the hospital stay. All the patients maintained a desired ABG without respiratory distress till SBC 7. At SBC 5, need for MV could be predicted with a sensitivity of 90.6% and specificity of 95.2%. Admission SBC cut-off of 13 and relative delta SBC at 24 hours cut-off of  $>20\%$  had a negative predictive value of 88.5% (95% CI 77.0% – 96.0%) and 80.8% (95% CI 60.7% – 93.4%) respectively for ruling out MV. SBC is a useful non-invasive measure for monitoring and guiding ABG analysis for intubation till SBC 7 repeated ABG may be avoided in GBS.

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