**Title:** Respiratory muscle assessment in Guillain-Barré-syndrome

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**Body:** Introduction Guillain-Barré-Syndrome (GBS) is a potentially life-threatening situation due to respiratory muscle involvement and paralysis. Objectives This study aimed to objectively assess the course of respiratory muscle function in GBS patients within the first week of intensive care treatment using neurological scoring systems, spirometry and indices of (non)volitional assessed respiratory and peripheral muscle strength. Methods and Measurements Patients were included immediately after establishing the diagnosis of GBS according to recent guidelines. Within the first week of treatment spirometry, peripheral (vigorimetry) and respiratory muscle function (respiratory drive: P0.1, global inspiratory/expiratory muscle strength: PImax/PEmax, sniff nasal pressure: SnPna) and neuromuscular scores (MRC Sum Score) were evaluated twice and the GBS Disability Score assessed once daily. On day one and seven non-volitional tests on respiratory muscle function (twitch mouth pressure during bilateral magnetic phrenic nerve stimulation: TwPmo) were added. Main Results Nine patients were included. MRC-Scoring (38.6SD18.3 vs 42.3SD16.3; p=0.08), vigorimetry (44.3SD40.6 vs 59.8SD49.5; p=0.003), PImax (5.8SD1.7 vs 7.2SD2.5; p=0.07) and SnPna (5.2SD2.2 vs 7.1SD2.0; p<0.001) increased. GBS-Scoring, spirometry and TwPmo (0.6SD0.3 vs 0.8SD0.2, p=0.14) remained unaltered. Only SnPna correlated closely with MRC-Scoring on day1 (r=0.77, p=0.02) and day7 (r=0.74, p=0.02). Conclusions Respiratory muscle strength is limited in acute GBS. SnPna proved as a reliable and easy to assess parameter of respiratory muscle function and was the only parameter that correlated with disease specific indices.