Can NIV parameters settings and changes overtime predict functional and survival outcome in ALS patients?

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Body: Early NIV may play a critical role in survival, and in its compliance. However, adherence have only been evaluated regarding n° of hours of use, and yet others variables recorded in the equipment’s software could also be useful. Objective: We looked for potential predictors among patients fully compliant to NIV. Methods: In a prospective trial design, we followed-up 60 patients (Jan 2008 to May 2012) that at the end of study were ascribed to two groups according to whether they were dead (G1) or alive (G2). They were all early ventilated, based on abnormal oximetry, phrenic nerve response or ALSFRS-R score < 12. At each 3 months patients were evaluated with respiratory function testing and all data from the NIV equipment were downloaded and registered. Primary outcomes: ALSFRS functional decline and disease duration to death or end of study; Secondary outcomes: time to NIV; NIV use and parameters settings at NIV adaptation. Results: No clinical or demographic differences were observed between groups at admission. Disease duration from symptoms onset and time to NIV adaptation were non-significant, but disease duration correlated positively with maximal inspiratory pressure, IPAP and backup breathing rate and nocturnal SpO2. At the end of study there were significant differences showing better functional status in G2 with lower heart and breath rate and reduced time spent with lower SpO2 and have higher IPAP pressures. Multivariate Cox regression analysis showed that IPAP pressures > 18 cmH2O was a significant predictor of survival (-Log-L: 82.56; sig. 0.0004; B - 0.36; Cl: 0.53 - 0.77; sig. 0.02) and a trend regarding a lower respiratory decline (-2Log-L: 124.03; sig. 0.000; B - 2.46; Cl: 0.53 - 0.77; sig. 0.05). Conclusions: For the first time, determinants of functional decline and survival are significantly related to parameters settings of NIV equipment.