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Title: Predictors of failure of non-invasive ventilation in patients with respiratory failure; a prospective study

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Body: Introduction In patients with respiratory failure, randomized studies have shown noninvasive ventilation (NIV) to be associated with lower rates of intubation. In these patients, predictors of NIV failure are not well characterized. We conducted this study to investigate variables predictive of NIV failure in patients with respiratory failure. Materials And Methods This prospective study was conducted at a tertiary care hospital in India. Fifty patients were included in the study, and were then followed up to discharge/expiry. Result Patients matched on baseline characteristics. Most of the patients (68%) did not have any pre-existing lung disease while 8 out of 50 (16%) had COPD. 4 patients (8%) had bronchial asthma, 2 patients had malignancy and 2 patients(4%) had history of previous Tuberculosis. In associated co-morbidities, 17 patients(34%) had Diabetes and 24 patients(48%) had hypertension. Oxygen saturation (SaO₂) was noted at the time of presentation and was correlated with mortality. Patients with SaO₂ less than 75 % were noted to have highest mortality(66%) among all the groups. Similarly data based on pH was noted and it was found that maximum patients (100%) requiring intubation were in the group of pH <7.25. When outcome was correlated with the level of pCO₂, it was found that mortality was highest (60%)in the group with pCO₂ > 60 mm/Hg. Highest mortality was observed in Asthma group(50%), followed by those with Malignancy(40%). Conclusion With prudent case selection, NIV is successful in more than 60% of cases. Failure of NIV may be related to the primary diagnosis. Association of co-morbidities as independent predictor of NIV failure needs further study.