BIPAP- Too Little, Too Late?

Abstract:

Sir,

Life-saving treatment for acute respiratory failure (ARF) traditionally mandated endotracheal intubation and positive pressure ventilation. However, this method of mechanical ventilatory assistance has its complications; hence the use of non-invasive ventilation (NIV) has emerged in recent times to become the preferred treatment modality[1]. The success of NIV depends on careful selection of patients who meet the well-established criteria for NIV and demonstrate no contraindications. Previous studies have shown that application of NIV on patients with an acute exacerbation of COPD may reduce the risk of intubation by almost 70%[2].

We conducted a local investigation on the administration of NIV in the form of Bi-level Positive Airway Pressure (BIPAP) in an acute general hospital. We sought to determine if BIPAP was initiated on patients according to standard guidelines and to examine their outcomes. Patients commenced on BIPAP were identified from the Coronary Care Unit (CCU) logbook. Their medical charts were then sourced from the Hospital Inpatient Enquiry and a predesigned questionnaire based on the British Thoracic Society guidelines[3] was completed for each of them. There were 21 patients who received BIPAP treatment from 1st October to 30th November 2011 with the mean age of these patients being 71.6years. A combination of COPD and CCF exacerbation (47.6%) was the predominant indication for BIPAP and this was followed by COPD exacerbations (28.6%). The mean arterial blood gas (ABG) results of these patients pre-BIPAP were pH 7.30, PO2 9.2kPa, PCO2 7.54kPa, and O2 saturations of 89.5%. There was a failure rate of 42.9% where 9 out of the 21 patients were unsuccessful on BIPAP, 3 of whom died while receiving BIPAP. Five patients were intubated following failure of BIPAP out of which 3 died. One patient was switched to CPAP.

Our investigation revealed a delay in the commencement of BIPAP with less than 40% of patients receiving BIPAP after more than 60 minutes had lapsed from the time a diagnosis of ARF was made. Delayed treatment with NIV can lead to severe respiratory acidosis and increased mortality[4]. Our study also revealed that there was no documented clinical evaluation with repeat ABGs in 76% of patients and 6 patients had the first repeat ABG only after 4 hours on BIPAP. The success of treatment also depends greatly on the aspect of monitoring patients while they are on BIPAP. The need for clinical assessment and ABG measurement would guide optimization of the ventilator settings and to indicate the patientsâ response to treatment.

It is recommended that ABGs be performed after 1-2 hours of BIPAP, and repeated up to 4 hours later if the earlier sample showed little improvement[3]. The possibility of nursing staff titrating NIV settings based on an agreed algorithm may improve the effectiveness of this intervention in small hospitals where out of hours medical cover is focused on acute medical admissions. In conclusion, there is a need for a robust protocol to be put in place as well as formal training of medical and nursing staff in order to improve on the current practice.

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