

Abstract

Background: Non-invasive positive pressure ventilation (NPPV) has gained popularity over the years in the treatment of acute respiratory failure (ARF). However, despite strong evidence of its benefit, NPPV failure rates have been reported to range from 5% to 40% across studies. Preliminary evidence suggests that delirium is an important factor contributing to NPPV failure.

Aims: The primary aim is to evaluate the prevalence and incidence of delirium in patients with ARF requiring NPPV. The secondary aims are (a) to explore the association between delirium and NPPV failure; (b) to identify the factors associated with delirium and (c) to examine the proportion of delirium cases that remain unresolved at 3 months.

Method: This prospective observation study was conducted in specialised respiratory wards at a regional hospital in Hong Kong. Consecutive patients admitted for ARF requiring NPPV were assessed for delirium according to the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV). Patients were assessed every 48 hours for up to 14 days after the initiation of NPPV until discharge or death. Ward

nurses administered the bilingual version of the Nursing Delirium Screening Scale (Nu-DESC). The illness severity upon index admission, co-morbidity level and pre-morbid functioning were also assessed. Univariate and multivariate analyses were performed to evaluate the factors associated with delirium and to assess the association between delirium and NPPV failure. Patients with unresolved delirium at the last assessment were re-assessed at 3 months.

Results: A total of 153 subjects were recruited, 49 (32.0%) of whom had delirium. Among these 49 subjects, 40 had delirium at the first assessment, whereas the other nine developed delirium subsequently. These findings indicated a delirium prevalence of 26.1% and an incidence of 8.0%. Delirium was observed to be independently associated with NPPV failure. Logistic regression analysis revealed that older age, lower baseline functioning as indicated by the Index of Independence in Activities of Daily Living (Index of ADL), lower serum albumin levels at the time of admission, higher severity of illness as indicated by the Acute Physiology and Chronic Health Evaluation II (APACHE II) and worse arterial pH levels were all independently associated with delirium. Of the 21 subjects with unresolved delirium at the last assessment, ten died in the hospital, four died after discharge and one failed to attend follow-up. The remaining six subjects were re-assessed at 3 months of which one

remained delirious. Patients with delirium had significantly longer hospital stays, and exhibited higher inpatient and 3-month mortality.

Conclusion: Approximately one-third of the subjects with ARF requiring NPPV developed delirium and this condition was associated with adverse outcomes, including NPPV failure, longer hospital stays and mortality. The identified association factors of delirium may assist physicians to promptly recognise delirium so that appropriate intervention can be made, which may in turn improve patient outcomes. Patients diagnosed with delirium should be closely monitored and managed with a multidisciplinary approach that involves close collaboration with psychiatrists. The liaison role of psychiatric team should be strengthened.

Keywords: delirium, acute respiratory failure, NPPV