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Title: The noninvasive ventilation results of critical stable hypercapnic patients in an intensive care unit

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Body: Introduction: The application of noninvasive ventilation(NIV) in respiratory asidosis(RA) has been defined. The data about use of NIV in patients without RA for treating hypercapnia is limited. Aim: We aimed to study the results of NIV application for critic hypercapnic patients without RA in intensive care unit(ICU). Methods: Study design: single center, retrospective cohort study. Setting: 22 bed medical ICU in a research and training hospital.Study period: January 2010-December 2011.Patients: Hypercapnic ($PaCO_2 \geq 65$mmHg) critic respiratory failure patients without RA(pH>7.35) who had no contraindications for NIV. ICU severity score(APACHE II), demographics, duration of NIV,arterial blood gas(ABG) results at admission, during NIV, nasal O_2 and on last ICU day, ICU days and mortality were recorded from patients' records. Patient data were given as median and interquartile ratio(IQR,25%-75%). Results: Of 2103 patients admitted to ICU in study period, 58(2.2%) patients with inclusion criteria were retrieved. $PaCO_2$ value at admission, during NIV, nasal O_2 and last day of ICU were 74 (69-82), 67 (61-79), 74 (63-80) and 60 (56-66) mm Hg, respectively ($p<0.001$) and PaO_2/FiO_2 values at admission and discharge were 186(143-235) and 240(202-282), respectively. APACHE II score, duration of NIV as hours(hr) on first and last day were 16 (12-18), 13 (9-14) and 6 (4-10), respectively. Days of ICU was 6 (4-9) and mortality in patient population was 4.3% (n=2) Conclusion: The improvement of hypercapnia in critic patients without RA can be achieved by intense and regular application of NIV in ICU.Those patients should be considered for long term home NIV support.