HIGH FLOW GAS THERAPY VIA NASAL CANNULA FOR RESPIRATORY INSUFFICIENCY

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Introduction: High flow gas therapy (HFT) via nasal cannula (NC) is a recent development for the treatment of patients with respiratory compromise. HFT delivers high flows of up to 40 liters per minute (lpm) supplemental gas at BTPS (Body Temperature Pressure Saturated) which patients find comfortable. In this study, we used HFT in lieu of non-invasive or invasive ventilation for patients with respiratory insufficiency. Respiratory insufficiency was defined as an increasing demand for supplemental oxygen along with decreasing oxygen saturation (SaO2%) and increasing respiratory rate (RR).
Method: Subjects with respiratory insufficiency were sequentially placed on HFT. All HFT measurements were recorded. A subjective modified Borg scale for dyspnea assessment was recorded after placement on HFT. HFT was delivered using the Vapotherm™ 2000i system. Failures on HFT were advanced to non-invasive or invasive ventilation. HFT was delivered via NC with temperature and flow rates titrated to patient comfort and oxygenation requirement. Recorded measurements post placement of HFT at time intervals of 30-60 minutes included RR and SaO2% measured by pulse oximetry.
Results: Twenty-nine patients (29) were studied. There were 10 females and 19 males. The mean age was 65 years (range of 16 – 84 years). Prior to initiation of HFT the mean respiratory rate was 25 bpm (range of 14 to 40 bpm), the mean SaO2% was 88% (range 78% - 95%). Supplemental oxygen in the control group was delivered using standard techniques including NC at 6 lpm (six patients) and Venti or NRB mask (twenty three patients). After administering HFT the mean respiratory rate was 20 bpm (range of 14 – 29 bpm), mean SaO2% was 97% (range 90% - 100%), the mean FiO2% requirement was 86% (range 35% - 100%) titrated using an oxygen blender, with a mean flow rate of 28 lpm (range 20 – 40 lpm). The mean temperature was 37°C (28 patients at 37°C, 1 patient at 36°C). Using a one-tailed, paired, t-test, there was a significant decrease in the respiratory rate (RR) for HFT compared to the Pre-HFT ($p = 0.0001$). There was a significant increase in Sa02% with HFT compared to Pre-HFT ($p = 0.000004$). No patient using HFT required subsequent non-invasive or invasive ventilation.
Conclusion: HFT significantly increased Sa02% and significantly decreased RR in all 29 patients in this study. HFT can improve acute respiratory insufficiency in patients without discomfort as indicated by patient response to the Borg scale questionnaire. HFT at flows up to 40 lpm per NC may be considered as an alternative to more aggressive respiratory therapy such as non-invasive or invasive ventilation. OF-04-024

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