Clinical Evidence

OxyMask VS. NRB Safety and Performance

ORIGINAL ARTICLE

Southmedic OxyMask™ compared with the Hudson RCI® Non-Rebreather Mask™: Safety and performance comparison

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BACKGROUND: ... many applic... and result... very system... igh fraction... on dioxide... OBJECT... (Southm... delivering... METHO... qualified e... (Harvard A... head were u... ($EtCO_2$), Fi... first second ... respiratory rate... and low-flow ... measured usin... of 1:2, $EtCO_2$ of 5... in. Mask performan... CONCLUSION... each tested cate... a higher inspired oxygen level, lower inspired CO_2 level, and more efficient CO_2 clearance at each mask flow level and simulated patient minute volume. This was especially true during conditions in which there were very low mask flow rates.

Key Words: *Delivery; Hypercarbia; Hypoxemia; Hypoxia; Non-rebreather mask; Oxygen; OxyMask; Respiratory failure*

"The OxyMask outperformed the traditional NRBM in each tested category. There was a higher inspired oxygen level, lower inspired CO_2 level, and more efficient CO_2 clearance at each mask flow level and simulated patient minute volume."

Le masque sans réinspiration OxyMask^MC de Southmedic et le masque sans réinspiration RCI Hudson : comparaison d'innocuité et de rendement

HISTORIQUE : Le masque sans réinspiration (MSRI) a de nombreuses applications et sert à de nombreux scénarios de soins aux patients chez qui l'hypoxémie et l'hypoxie qui en découle posent problème. Le MSRI est un système de distribution d'oxygène à faible débit qui est facile à installer et peut insuffler une fraction inspirée d'oxygène (FiO_2) relativement élevée. Le potentiel d'élimination inefficace du dioxyde de carbone (CO_2) à faible débit représente un problème d'innocuité.

OBJECTIF : Les auteurs ont postulé que l'utilisation d'un OxyMask (SouthMedic Inc, Canada) réduirait ces problèmes d'innocuité tout en ... relativement élevée.

MÉ... ... diplômés ont effectué des bancs d'é... ...-Unis). Ils ont u... ...s-Unis) ... ...quin pour ... O_2 de fir... ...chute en ... à diver... ...ux catégo... ...chacun des ...écédents au ...spiration et ...spiratoire de ...res de rende...

... habituel dans ... élevé, le taux ...icace à chaque ...ute simulée des ...it très faible.

"We believe that our data suggests that the Southmedic OxyMask may be a safer alternative to the Hudson RCI NRBM in which conditions exist that make inadvertent low oxygen delivery flows more likely to occur."

The patient safety profile of a non-rebreather mask (NRBM) has been a matter of concern for some time; however, there is very little reference to these performance characteristics in the literature (1-3). Low-flow characteristics and a potential lack of effective washout of exhaled gases can lead to rebreathing of carbon dioxide (CO_2) in certain conditions (1-3). This concern has previously led to aftermarket modifications to the NRBM by way of removing one of the one-way valves that are located on either side of the mask. This modification is intended to reduce or attenuate the rebreathing of exhaled gasses and potential for hypercarbic respiratory failure and lower fraction of inspired oxygen (F_iO_2) leading to hypoxemia. These conditions may exist when the mask ... disconnected from its fresh gas source or the ver... ...t is obstructed (2,4). We hypothesized that the open design of the OxyMask™ (Southmedic Inc, Canada) would mitigate these concerns by allowing for less CO_2 rebreathing while delivering inspired oxygen levels that compare favourably with the Hudson RCI® NRBM™ (Teleflex Inc, USA) (5-7).

METHODS

The CO_2 source was attached to the inhalation limb of the Harvard Pump (Harvard Apparatus, USA) on the piston side of the inhalation check valve. A 0.125 inch OD sensing oxygen line was attached to the

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OxyMask

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