INTRODUCTION

Ventilating patients with a bag-valve (BV) device on mask or endotracheal tube has been demonstrated to be haphazard even in experienced hands. Severe adverse outcomes have been described.

The Oxylator® FR-300 (a first responder resuscitator) has been introduced to simplify and improve outcome during emergency ventilation.

AIM OF THIS STUDY

This study was designed to evaluate potential improvement in ventilation with the Oxylator® FR-300, with regard to establishing and maintaining normocapnia (ETCO2) compared with the BV device.

PATIENTS AND METHODS

Firemen were recruited and given three hours of theory and practical training on manikins. They were told to achieve and maintain a free airway and normocapnia (AHA guidelines), and distracted.

Patients scheduled for elective general anesthesia were recruited. After induction of hypnosis (H) a bag-valve followed by the Oxylator® in manual (Oxy-m) and automatic (Oxy-a) mode were used to ventilate with mask. These three steps were repeated after addition of muscle relaxation (HC), first with the mask and again after placement of the endotracheal tube (ETT).

The fireman ventilating was blinded for the Datex-Ohmeda M-COVX spirometer monitoring and for the flow (24 L/min or 30 L/min) of the Oxylator®. The working pressure was 20 cmH2O in all cases. Per protocol, ventilation was cut off if the inspiration time was excessive. ETCO2 was kept ≥ 18 mmHg. Time was allowed for return to normocapnia between steps as needed.

RESULTS

104 patients completed the protocol. The mean age was 49 ± 17 years old (range 18-91). Weight varied from 48 to 132 kg (76 ± 15.1 kg). 47% was male.

ETCO2 data were used only when inspiratory and expiratory volumes approximated each other. The ETCO2 curve was visually monitored.

CONCLUSION

We found that the Oxylator® FR-300 has a high efficacy and efficiency when used by first responders to achieve and maintain normocapnia under clinical and controlled conditions (p<0.01).

Minimal training seems sufficient for safe use by first responders. A wide weight range of patients can be treated adequately.

2: Standards for CPR and ECC, JAMA 1974; 227(7): 833-868