

The Ambu Bag Is Superior to the Mapleson D for Hyperventilating Electroconvulsive Therapy Patients

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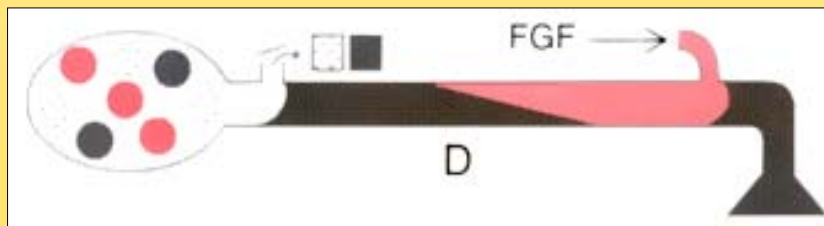
Introduction

Anesthesiologists are often asked to induce hypocapnia in patients undergoing an intravenous anesthetic for electroconvulsive therapy (ECT). Although a variety of equipment is available to ventilate these patients, Mapleson D circuits, Ambu bags, and anesthesia machines with circle systems are most commonly used. To compare the ability of commercially available Mapleson D and Ambu-bag circuits to produce hypocapnia, we performed a bench study using capnography.

Methods

A test lung producing carbon dioxide at a constant rate was attached to commercially available Mapleson D or Ambu bag. A capnograph/ gas analyzer was attached to the test lung, which was then ventilated with a minute ventilation in the range of 10 liters/min. Fresh gas flow was 10 liters/min oxygen. The capnographs generated were photographed.

Mapleson Circuit



Results

At similar minute ventilation rates, the ambu-bag produced hypocapnia more effectively than did the Mapleson D circuit. The capnograph from the Ambu bag is displayed in figure 1. The capnograph from the Mapleson D circuit is displayed in Figure 2.

Discussion

Capnography is not routinely monitored during the brief anesthetics administered for most ECTs. Hence, most anesthesiologists do not know whether they are effectively producing hypocapnia. The inability of the Mapleson circuit to produce hypocapnia with hyperventilation is likely caused by insufficient fresh gas flow and rebreathing of exhaled gases (1). Ventilation with a circle system/circuit and CO2 absorber may also produce more successful ECT than mask ventilation via a Mapleson D circuit. Anesthesiologists asked to hyperventilate a patient for ECT should either use an Ambu bag, a circle system with CO2 absorber, or a Mapleson D circuit with increased fresh gas flow to compensate for rebreathing effects.

Ambu Bag



Figure 1

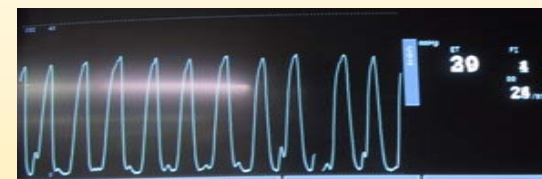
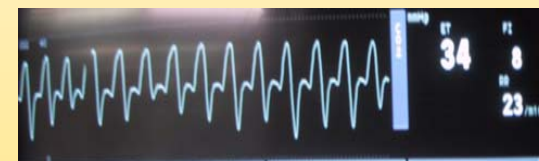


Figure 2



Reference

1. Mapleson WW. The elimination of rebreathing in various semi-closed anaesthetic systems. Br J Anaesth 1954;26:323

