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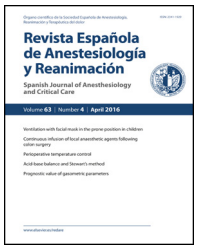

ORIGINAL ARTICLE

Haemodynamic response and effectiveness of tracheal intubation with Airtraq® versus Macintosh laryngoscope in paediatric patient undergoing elective surgery: Prospective, randomised and blind clinical trial☆

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KEYWORDS
Airway management;
Intubation;
Intratracheal;
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Laryngoscope Macintosh;
Paediatrics

Abstract
Objective: To compare the haemodynamic response and effectiveness of tracheal intubation with Airtraq® device and Macintosh laryngoscope, for airway management of patients between 2 and 8 years undergoing elective surgery.
Methods: A prospective, comparative, randomised and blind clinical trial where the effectiveness of tracheal intubation in 80 paediatric patients undergoing elective surgery was determined. Patients were divided into 2 groups of 40 subjects each: group A, intubated with Airtraq® optical laryngoscope; and group M, intubated with Macintosh laryngoscope. Haemodynamic changes, time and number of attempts at intubation and its complications were evaluated in both.
Results: Heart rate was higher in group M from minute 1 to 5 with statistically significant difference (p: 0.001). The mean, systolic and diastolic blood pressure and $EtCO_2$ values were higher in group M. There were no statistically significant differences in SO_2. There was a statistically significant difference in time (group A: 18 ± 4 s, group M: 27 ± 7 s) and the number of attempts for intubation were lower for group A (p: 0.001). Seven patients in group M had post-intubation complications while only one subject had in group A.
Conclusion: Intubation with Airtraq® device is more effective than Macintosh laryngoscope in terms of reduction of haemodynamic changes, SO_2, $EtCO_2$, time and number of attempts for intubation and complications in paediatric patients undergoing elective surgery.

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PALABRAS CLAVE
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Dispositivo óptico Airtraq®;
Laringoscopio Macintosh;
Pediátricos

Respuesta hemodinámica y efectividad de la intubación orotraqueal con Airtraq® versus laringoscopio Macintosh en pacientes pediátricos sometidos a cirugía electiva: estudio prospectivo, aleatorizado y ciego

Resumen
Objetivo: Comparar la respuesta hemodinámica y efectividad de la intubación orotraqueal mediante los dispositivos Airtraq® y laringoscopio Macintosh, para asegurar la vía aérea de pacientes entre 2 y 8 años sometidos a cirugía electiva.
Métodos: Estudio con diseño prospectivo, comparativo, aleatorizado y ciego, donde se determinó la efectividad de la intubación orotraqueal en 80 pacientes pediátricos programados para cirugía electiva. Los pacientes fueron divididos en dos grupos de 40 pacientes cada uno: grupo A, intubados con laringoscopio óptico Airtraq®; y, grupo M, intubados con laringoscopio Macintosh. Se evaluó en ambos la respuesta hemodinámica, tiempo y número de intentos para la intubación y sus complicaciones.
Resultados: La frecuencia cardíaca fue mayor en el grupo M del minuto 1 al 5 con diferencia estadísticamente significativa (p: 0,001). Los valores de presión arterial media, sistólica y diastólica y de $EtCO_2$ fueron mayores en el grupo M. No hubo diferencias estadísticamente significativas en cuanto a la saturación de oxígeno. Hubo diferencia estadísticamente significativa en cuanto al tiempo de intubación (grupo A: 18 ± 4 segundos; grupo M: 27 ± 7 segundos) y el número de intentos siendo menor para el grupo A (grupo A: 92,7% y grupo M: 40% al primer intento; p: 0,001). Siete pacientes del grupo M y uno del grupo A presentaron complicaciones posteriores a la intubación.
Conclusión: La intubación con dispositivo Airtraq® es más efectiva que con laringoscopio Macintosh en cuanto a reducción de cambios hemodinámicos, SO_2, $EtCO_2$, tiempo y número de intentos para la intubación y complicaciones, en pacientes pediátricos sometidos a cirugía electiva.

Introduction

Airway management (AM) in paediatric patients is a challenge for the anaesthesiologist. The paediatric airway presents major anatomical and physiological differences that increase the complexity of the procedure, and both the equipment and dosages used are far smaller. In recent years, a number of devices have been created to guarantee safe management of the adult airway, but only some of these are suitable for children.[1]

The Macintosh curved blade, described in 1941 by Robert Macintosh, is the blade most widely used in both paediatric and adult patients. The choice of blade size depends on the age and weight of the patient and the preference of the anaesthesiologist. However, the low success rate and multiple intubation attempts, airway injury, hypoxia, tachycardia, increased intracranial, intraocular and arterial pressure, aspiration and cardiac arrest have limited the routine use of this technique, and now other devices, such as videolaryngoscopes are recommended, particularly in patients with predictors of difficult airway.[2]

The Airtraq® is a disposable rigid optical laryngoscope that was first marketed in 2005. It is designed to facilitate complete visualisation of the airway throughout the intubation process.[3] Its short learning curve and high success rate when compared to the conventional Macintosh laryngoscope make the Airtraq® a useful device in the hands of medical and paramedical personnel. Studies have shown that the Airtraq® requires fewer attempts to achieve correct intubation, shortens the overall time to intubation, requires fewer external manoeuvres to optimise vocal cord vision, and reduces the risk of injury.[4–6]

Paediatric Airtraq® devices have recently been released: sizes 1 and 0 for endotracheal tubes of between 3.5 and 5.5 mm (with or without inflatable cuff) and 2.5 and 3.5 mm internal diameter, respectively.[7] However, few studies have evaluated its use in children, and even fewer have described the efficacy and potential complications of this device in the paediatric population. Therefore, we asked the following question: in paediatric AM, is the Airtraq® more effective than the Macintosh laryngoscope, and does it attenuate intubation-induce haemodynamic changes?

We hypothesised that the AM with the Airtraq® is more effective and causes less significant haemodynamic changes than the Macintosh laryngoscope in patients aged between 2 and 8 years undergoing scheduled surgery. The main objective of this study was to compare the haemodynamic response and effectiveness of orotracheal intubation using the Airtraq® and Macintosh laryngoscope to secure the airway of paediatric patients aged between 2 and 8 years undergoing scheduled surgery.