

COMPARATIVE EVALUATION OF TRACHEAL TUBE CUFF FILLED WITH AIR, SALINE OR ALKALINISED LIDOCAINE ON LARYNGOTRACHEAL MORBIDITY IN CHILDREN - A RANDOMISED, CONTROLLED STUDY

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Introduction and aims:

Endotracheal intubation is commonly associated with laryngotracheal morbidity in the postoperative period. The effects like cough, hoarseness of voice, sore throat etc are not only distressing to the patient, but can also lead to potentially serious surgical and cardiovascular complications. Endotracheal tube (ETT) cuff is considered one of the important contributing factors leading to postoperative laryngotracheal morbidity. The use of alkalinised lidocaine to inflate the ETT cuff has been observed to reduce the incidence of postoperative laryngotracheal morbidity in adults, however there is a paucity of similar literature available in paediatric population.¹ The aim of our study was to compare the effects of air, saline and alkalinised lidocaine-filled ETT cuff on postoperative laryngotracheal morbidity in children.

Methods:

A double-blind, randomised controlled study was conducted in forty five children undergoing elective surgery under general anaesthesia (GA) with orotracheal intubation. Children aged 4-14 years with ASA physical status 1 or 2 and anticipated duration of surgery between 1-3 hours were included in the study. A standardised GA technique as per institutional protocol was followed in all children. Participants were randomly allocated to Group A, Group S or Group L following orotracheal intubation, in which air, saline or 1% alkalinised lidocaine solution was used to inflate ETT cuff, respectively. The cuff pressure was monitored throughout the procedure and maintained below 20 cm H₂O. Evaluation of laryngotracheal morbidity i.e. cough, hoarseness of voice and sore throat was performed at 1 hour and 6 hours following tracheal extubation.

Results:

A significantly lower incidence of overall laryngotracheal morbidity was observed in Group L when compared to both Group A ($p < 0.001$) and Group S ($p = 0.001$) at 1 hour following tracheal extubation. The result was statistically similar in Group A and S ($p = 0.5$).

Similarly, a lower incidence of overall laryngotracheal morbidity was also observed at 6 hours following tracheal extubation in Group L, when compared to both Group A ($p = 0.003$) and Group S ($p = 0.084$), however it was statistically significant only in comparison with Group A. The result was statistically similar in Group A and S ($p = 0.136$).

Discussion and conclusion:

ETT cuff filled with lidocaine 1% solution acts as a reservoir for local anaesthetic,² gradually releasing lidocaine which exerts a localised, topical anaesthetic effect on the underlying tracheal mucosa. Alkalinisation of lidocaine 1% solution results in faster diffusion rate across the ETT cuff and significant reduction in dose requirement of local anaesthetic,³ hence further decreasing the laryngotracheal morbidity associated with endotracheal intubation. In conclusion, ETT cuff filled with alkalinised lidocaine 1% solution, when compared to air or saline, reduces the incidence of postoperative laryngotracheal morbidity in children.

References

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