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Sore throat and hoarseness after fiberoptic nasotracheal intubation

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Abstract: Fiberoptic nasotracheal intubation is frequently chosen for surgery involving the oral cavity. In such cases, the endotracheal tube passes through the vocal cords into the trachea blindly, which may cause laryngeal trauma. We, therefore, studied the incidence of sore throat and hoarseness after fiberoptic nasotracheal intubation (n = 44) and compared the results with those after conventional oral intubation (n = 35). The incidence of sore throat was lower in the fiberoptic nasotracheal intubation group than in the conventional oral intubation group but the difference was not statistically significant (25.0% s 42.8%). The incidence of hoarseness after fiberoptic nasotracheal intubation was significantly lower than that after conventional oral intubation (4.5% s 34.3%, $P < 0.05$). This study confirms a low incidence of laryngeal trauma in fiberoptic nasotracheal intubation.

Key words: Nasotracheal intubation, Fiberscope, Complications, Sore throat, Hoarseness

Introduction

Fiberoptic nasotracheal intubation is usually used for general anesthesia for oral surgery in our hospital. During tracheal intubation under guidance of a bronchoscope, the insertion of an endotracheal tube through the vocal cord is done blindly. Therefore, the incidence of sore throat and hoarseness may increase after the fiberoptic nasotracheal intubation. The incidence of sore throat and hoarseness after conventional oral intubation using a laryngoscope has been studied extensively [1–3]. However, to our knowledge, there are no reports of fiberoptic nasotracheal intubation in this regard. The present study was undertaken to compare the incidence of sore throat and hoarseness after fiberoptic nasotracheal intubation with that after conventional oral intubation.

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Materials and methods

Postoperative sore throat and hoarseness were evaluated in 79 patients aged 15–81 years whose surgical procedure did not involve the pharyngeal or the laryngeal region, and did not require placement of a nasogastric tube. The patients were allocated to the following two groups: A, the fiberoptic nasotracheal intubation group (n = 44) or B, the conventional oral intubation group (n = 35).

The patients were premedicated with midazolam 0.05 mg·kg^{-1} and atropine 0.5 mg intramusculary. Anesthesia was induced with thiopental 4 mg·kg^{-1}, vecuronium 0.2 mg·kg^{-1}, and fentanyl 5 μg·kg^{-1}. Fiberoptic nasotracheal intubation was accomplished in the supine position. The bronchoscope, with the tracheal tube mounted on it, was passed through the nose and into the trachea with the jaw pulled forward by an assistant to open up the retropharyngeal space. The tip of the bronchoscope was positioned above the carina and the tracheal tube was slowly advanced into the trachea. Conventional oral intubation was performed using a Macintosh-type laryngoscope under direct inspection. In both groups, lidocaine jelly was used and cuffs were inflated to a volume needed to prevent gas leak at 35 cm H_2O pressure. Cuff volumes were checked hourly and adjusted for volume changes due to N_2O diffusion into the cuff [4]. Each patient was interviewed 24–28 h after the end of anesthesia by one of the authors. Patient responses were graded as follows. Sore throat: 0 = none, 1 = similar to that noted with a cold, 2 = more severe than with a cold; Hoarseness: 0 = none, 1 = similar to that noted with a cold, 2 = aphonia.

Data are expressed as the mean ± SD and analyzed by the chi-square test and analysis of variance as appropriate. $P < 0.05$ was considered significant.

Results

Table 1 shows the patient characteristics. There were no significant differences between group A and B with respect to sex distribution, age, height, and weight. Table 2 summarizes the incidence of sore throat and hoarseness in two groups. The incidence of sore throat in group A was lower than group B but the difference was statistically insignificant ($P = 0.15$, chi square). The incidence of hoarseness was significantly lower in group A than in group B ($P = 0.0008$, chi square). Sore throat and hoarseness noted in group A and B were all rated level 1. Tables 3 and 4 show the relationships among the incidence of sore throat and hoarseness, the outer diameter of the end of the tracheal tube and the duration of intubation *in the two groups*. There were no significant differences by sex in the incidence of sore throat and hoarseness after intubation in either group. Also, there was no correlation between the endotracheal tube size or the duration of intubation and the occurrence of sore throat or hoarseness in either group. The endotracheal tube size was the same in patients who had sore throat and hoarseness in groups A and B (Tables 3, 4).

Discussion

The incidence of sore throat and hoarseness after conventional oral intubation was around 35%, which was similar to that of previous reports [1–3]. Although the increase in the incidence of sore throat and hoarseness

Table 1. Patient characteristics

	n	Age	Male/female	Height (cm)	Weight (kg)
Group A	44	38 ± 17	21/23	159 ± 9	54 ± 11
Group B	35	43 ± 18	11/24	156 ± 8	54 ± 9

Mean ± SD.

Table 2. Incidence of sore throat and hoarseness

	Group A	Group B
Sore throat	11/44 (25.0%)	15/35 (42.8%)
Hoarseness	2/44 (4.5%)*	12/35 (34.3%)

*$P < 0.05$ *s* group B.

Table 3. Relation between the incidence of sore throat and hoarseness and the endotracheal tube size and the length of intubation in Group A

		Sore throat		Hoarseness	
		Yes	No	Yes	No
Size of endotracheal tube (O.D. mm)	Male (21)	9.7 ± 0.6 (5)	9.7 ± 0.8 (16)	10.0 ± 0 (1)	9.7 ± 0.8 (20)
	Female (23)	8.9 ± 0.5 (6)	8.9 ± 0.6 (17)	8.7 ± 0 (1)	8.7 ± 0.4 (22)
Ouration of intubation (min)	Male (21)	81 ± 29 (5)	129 ± 54 (16)	120 ± 0 (1)	117 ± 54 (20)
	Female (23)	130 ± 57 (6)	181 ± 125 (17)	120 ± 0 (1)	170 ± 114 (22)

Mean ± SD. Numbers in parentheses represent the number of patients.

Table 4. Relation between the incidence of sore throat and hoarseness and the endotracheal tube size and the length of intubation in Group B

		Sort throat		Hoarseness	
	N	Yes	No	Yes	No
Size of endotracheal tube (O.D. mm)	Male (11)	9.9 ± 0.9 (4)	9.7 ± 0.8 (7)	9.9 ± 1.2 (3)	9.8 ± 0.8 (8)
	Female (24)	9.1 ± 0.5 (11)	9.1 ± 0.5 (13)	9.0 ± 0.5 (9)	9.2 ± 0.5 (15)
Length of intubation (min)	Male (11)	156 ± 76 (4)	157 ± 46 (7)	107 ± 53* (3)	176 ± 45 (8)
	Female (24)	143 ± 56 (11)	206 ± 62 (13)	137 ± 76 (9)	201 ± 48 (15)

Mean ± SD. The numbers in parentheses represent the number of patients.
*$P < 0.05$ yes *s* no.

after fiberoptic nasotracheal intubation was expected, the present study clearly demonstrated that the incidence was even lower than that of conventional oral intubation.

Stout et al. [5] showed that the incidence of sore throat and hoarseness after endotracheal intubation was lower when a smaller tube was used. There were no significant differences in endotracheal tube size between groups A and B patients who had sore throat and hoarseness. Therefore, direct stimulation of the laryngeal region by the blade of the laryngoscope during intubation may be responsible for the higher incidence of sore throat and hoarseness in conventional oral intubation group.

Regarding the duration of intubation, Lesser and Lesser [6] reported that laryngeal trauma was directly proportional to the duration of intubation. However, Peppard and Dickens [1] demonstrated that no correlation was found between laryngeal trauma and the length of intubation as long as the duration of intubation is short. In the present study, no correlation was found between the incidence of sore throat and hoarseness and the duration of intubation in either group, which was compatible to the report by Peppard and Dickens [1].

We conclude that fiberoptic nasotracheal intubation does not increase the occurrence of pharyngeal and laryngeal trauma, even though insertion of the endotracheal tube through the vocal cords is done blindly under the guidance of a bronchoscope.

References

1. Peppard SB, Dickens JH (1983) Laryngeal injury following short-term intubation. Ann Otol Rhinol Laryngol 92:327–330
2. Lesser T, Williams G (1988) Laryngographic investigation of post-operative hoarseness. Clin Otolaryngol 13:37–42
3. Jones MW, Catling S, Evans E, Green DH, Green JR (1992) Hoarseness after tracheal intubation. Anaesthesia 47:213–216
4. Revenuås B, Lindholm C-E (1976) Pressure and volume changes in tracheal tube cuffs during anesthesia. Acta Anaesthesiol Scand 20:321–326
5. Stout DM, Bishop MJ, Dwersteg JF, Cullen BF (1987) Correlation of endotracheal tube size with sore throat and hoarseness following general anesthesia. Anesthesiology 67:419–421
6. Lesser THJ, Lesser PJA (1987) Laryngeal trauma *s* length of intubation. J Laryngol Otol 101:1165–1167