Sore throat and hoarseness after total intravenous anaesthesia

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Background. Sore throat and hoarseness are common complications, but these have not
been studied after total i.v. anaesthesia.

Methods. We prospectively studied 418 surgical patients, aged 15–92 yr, after total i.v. anaes-
thesia with propofol, fentanyl and ketamine to assess possible factors associated with sore
throat and hoarseness.

Result. We found sore throat in 50% and hoarseness in 55% of patients immediately after
surgery. This decreased to 25% for sore throat and 24% for hoarseness on the day after
surgery. Both sore throat and hoarseness were more common in females and when lidocaine
spray had been used. Cricoid pressure during laryngoscopy was inversely associated with the
risk of sore throat.

Conclusion. Knowledge of these factors may reduce postoperative throat complications, and
improve patient satisfaction.

Br J Anaesth 2004; 92: 541–3

Keywords: anaesthesia, general; complications; equipment, intubation-tracheal tube

Accepted for publication: December 1, 2003

Cuffed tracheal tubes are often used in general anaesthesia
to facilitate positive-pressure ventilation and to protect the
airway from aspiration. Intracuff pressure increases when
nitrous oxide is used in general anaesthesia,1 and this
pressure may cause postoperative sore throat.2

Total i.v. anaesthesia is now popular. If nitrous oxide is
not used, this may alter postoperative sore throat and
hoarseness, but this is not known. We set out to assess
patient and operative factors associated with sore throat and
hoarseness after total i.v. anaesthesia.

Methods

After receiving hospital ethics committee approval and
informed consent from the subjects, we enrolled 418
surgical patients of ASA class I–III, aged 15–92 yr, over a
20-week period. We preliminarily divided these weeks into
four sequential time periods:

1. Water-soluble jelly (K-Y Jelly, Johnson & Johnson,
USA) was used as the cuff lubricant, and lidocaine spray
(Xylocaine 8% pump spray, AstraZeneca, Sweden) was
applied to the larynx before intubation.
2. Water-soluble jelly was used, but lidocaine spray was
not applied.
3. Lidocaine jelly (Xylocaine 2% jelly, AstraZeneca,
Sweden) was used as the cuff lubricant, and lidocaine spray
was applied.
4. Lidocaine jelly was used, but lidocaine spray was not
applied.

Patients were sequentially allocated to the four study
groups.

General anaesthesia was induced and maintained with
propofol, fentanyl and ketamine, with or without epidural
block. Intubation was with one of three types of tracheal
tube: routine tracheal tube with standard cuff (Trachelon,
Terumo, Japan), a Ring-Adair-Elwyn (RAE) tube with high-
volume, low-pressure cuff (Mallinckrodt Medical, Ireland),
or a reinforced tube with standard cuff (Phycon, Fuji
Systems, Japan). The RAE and reinforced tubes were used
mainly in head or neck procedures. The tube cuff was
inflated until no air leak could be detected with an airway
Variables considered significant by logistic regression analysis are shown in Table 1. Both sore throat and hoarseness immediately after surgery were more common in females. Application of lidocaine spray also predicted both sore throat and hoarseness after surgery. Cricoid pressure reduced the risk of hoarseness immediately after surgery.

### Discussion

Previous studies when nitrous oxide was used reported sore throat in 14–50% of patients and hoarseness in 22–50%. We found sore throat and hoarseness in patients undergoing total i.v. anaesthesia in 50% and 55% of patients, respectively, which is similar to or greater than the incidences reported in studies of nitrous oxide anaesthesia.

An explanation for this high incidence of sore throat and hoarseness may be that i.v. techniques require careful titration of drugs to maintain adequate depth of anaesthesia. Bispectral index monitoring or target-controlled infusion help to provide adequate sedation, but these methods were not always available. Inadequate relaxation or movement may have occurred more frequently in our patients than in the patients in the previous studies who received volatile anaesthesia and nitrous oxide. This could increase sore throat and hoarseness. Although approximately one-half of patients who complained of sore throat and hoarseness recovered spontaneously within 24 h after extubation, sore throat and hoarseness were both still common problems immediately after total i.v. anaesthesia.

Application of lidocaine spray was strongly associated with postoperative sore throat and hoarseness. Lidocaine spray is widely used before intubation; however, its effect on postoperative sore throat and hoarseness is unclear. The lidocaine spray we used contains ethanol and l-menthol as additives. These additives may be the cause of higher incidence of sore throat and hoarseness seen in our study.

Consistent with previous reports, female sex was a strong predictor of postoperative sore throat and hoarseness; females may have been intubated with a relatively tightly fitting tube, which could increase sore throat and hoarseness, as a previous study indicated.

Application of cricoid pressure during laryngoscopy reduces hoarseness immediately after surgery. We often find that application of cricoid pressure facilitates visualization of the vocal cords during laryngoscopy. This manoeuvre helps to avoid damage around the vocal cords caused by forcible intubation, which could lower the incidence of hoarseness.

One limitation of our study is the time of the first evaluation of sore throat and hoarseness. Although we excluded inappropriate candidates with the modified RSS, some patients may not have been able to respond accurately to specific questions about sore throat and hoarseness.

In conclusion, sore throat and hoarseness are common after total i.v. anaesthesia. They are more common in females and after lidocaine spray. Application of cricoid pressure helps to reduce the risk of hoarseness immediately after surgery.
pressure reduced the risk of sore throat immediately after surgery. Knowing the factors that can cause or reduce postoperative sore throat and hoarseness after i.v. anaesthesia may reduce unnecessary complications and improve patient comfort and satisfaction.

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