Effects of remifentanil on esophageal sphincters and swallowing function

av

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Akademisk avhandling

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Abstract


Pulmonary complications like pneumonia are common perioperatively, and one potentially important cause is thought to be silent aspiration. There are several levels of defence against pulmonary aspiration that can be affected by drugs in anaesthesia. Competence of esophageal sphincters prevents regurgitation of gastric content, and complex reflex systems (with or without coincident swallowing) guard direct entrance into the airway. Furthermore, in our previous studies healthy volunteers spontaneously complained about swallowing difficulties when they received remifentanil, and difficult swallowing may be a poorly recognized side effect of remifentanil. The aim of this thesis was to study the effect of remifentanil on different components of airway protection with and without coincident swallowing, and to explore whether remifentanil increases the risk of pulmonary aspiration. The purpose was also to determine to what extent remifentanil induces subjective swallowing difficulties.

The competence of the esophagogastric junction and esophageal peristalsis were studied using high resolution manometry. Pharyngeal swallowing was evaluated using a novel method called automated impedance manometry analysis. Infusion of a tracer infusion into the nasopharynx and subsequent lung scans was employed to detect remifentanil-induced aspiration, and subjective swallowing difficulties were evaluated on a four-point scale.

This thesis found that, at doses used in clinical settings, remifentanil increases the incidence of aspiration in healthy volunteers. Remifentanil influences several mechanisms that protect the airway towards greater dysfunction, which may increase the risk of pulmonary aspiration. Remifentanil also appears to induce subjective swallowing difficulties when dry swallows are performed, although no association between aspiration and swallowing difficulties was observed. These findings may improve clinical practise toward cautious use of the drug, especially regarding spontaneously breathing patients in the monitored anaesthesia care setting.

Keywords: Pulmonary aspiration, postoperative lung complications, silent aspiration, defence against pulmonary aspiration, remifentanil, competence of esophageal sphincters, esophageal peristalsis, pharyngeal swallowing, high resolution manometry

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