Institutionen för molekylär medicin och kirurgi

TIMING OF RESPIRATION
AND SWALLOWING EVENTS
DURING DEGLUTITION

AKADEMISK AVHANDLING
som för avläggande av medicine doktorsexamen vid Karolinska Institutet offentligen försvaras i Kuelbergssalen, R2:U1.

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av

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ABSTRACT

Background  Dysphagia is a common symptom that can be due to disease, but can also occur without a known cause. Today, we know that the coordination of swallowing and respiration is essential for a safe swallow. Swallowing consists of several subsecond events. To study these events, it’s important to use modalities with high temporal resolution. In the first study in this thesis, we examined young healthy individuals with simultaneous videofluoroscopy, videomanometry and respiratory recordings, all with high temporal resolution. We know that dysphagia is more common in elderly and in patients with gastroesophageal reflux disease, (GERD). Whether this increased incidence of dysphagia in elderly is due to a disease process or is part of normal ageing is somewhat unclear. Furthermore, we believe that the increased incidence of dysphagia in GERD patients is due to reflux of gastro-duodenal content into the pharynx and larynx, which likely alter the sensory nerves of the mucosa which might deteriorate the sensitivity. To evaluate these two groups, we used our young healthy controls as a reference. However, to be able to use this control group, we used the same technique, modalities and protocol as in the study with young healthy volunteers.

All of the above described studies were mostly experimental studies. Of this reason we wanted to perform a more clinical study and as swallowing maneuvers are the main treatment for dysphagia, caused by functional (neuromuscular) dysfunction. The aim of this study was to evaluate different swallowing maneuvers by intraluminal pharyngeal manometry in healthy volunteers.

Material and Methods  We examined all volunteers in our first three studies, with simultaneous videofluoroscopy, videomanometry and respiratory recordings, all with high temporal resolution. In the young group, the onset of 13 predetermined swallowing and respiratory events and the surrounding respiratory phase pattern were studied in different body positions and different respiratory drives, which were induced by breathing 5% CO2. In the elderly group we did not induce hypercapnia. However, six of the included 26 volunteers were examined in both the upright and the decubitus position, to evaluate whether posture had any effect on swallowing and respiratory coordination or on the swallowing safety. Our results demonstrated a highly repeatable and fixed temporal coordination of the swallowing and respiratory events despite position and respiratory drive.

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