Breathing pattern and route of breathing during endoscopic retrograde cholangiopancreatography (ERCP) under sedation in elderlies

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BACKGROUND

- Invasive procedures of upper gastrointestinal endoscopy such as ERCP are routinely performed under intravenous sedation and local anesthesia.
- We lack knowledge on nature of breathing during sedation for the endoscopic procedures. In particular, insertion of an endoscope through the mouth might change the breathing route leading to inaccurate breathing assessments only through the nasal route.

AIMS and HYPOTHESIS

1) To test a hypothesis that nasal pressure measurement alone reflects breathing even during insertion of an endoscope through the mouth.

2) To describe breathing during and after the ERCP procedure in elderlies.

RESULTS

- Twenty-one elderlies, mean aged 76.7±14.7 years old (mean±SD) and BMI 23.2±3.0 kg/m², have been recruited and completed the study protocol. (Tab.1)
- Disordered breathings were common in all cases during sedation and apnea- hypopnea index (AHI) with and without insertion of endoscopy were 16.1±12.0 and 10.8±11.4 hour⁻¹. (Tab. 2)
- Central apnea and hypopneas were less common and specifically limited immediately after injection of the sedatives and narcotics. (Fig. 1)
- Insertion of the endoscopy shifted predominant breathing route from the nasal (78.3±34.8% of the study time) to the oro-nasal (86.8±28.7%), and the nasal pressure signals were significantly weakened, but assessable 90% of time of the sedation. (Fig. 2, Tab. 2)

METHOD

【Study type】 Prospective observational

【Subjects】 21 elderly patients who are scheduled for ERCP under sedation

【Settings】 In addition to routine cardiorespiratory monitoring, close respiratory monitoring was performed by measurements of nasal cannula pressure*¹ and oral airflow with a thermistor*² during the ERCP.

【Protocol of sedation】

(Nasal oxygen 4L/min)

Topical anesthesia

ERCP procedure

Sedation

Midazolam (0.5-2mg) and Fentanyl (50-200µg), Dexmedetomidine infusion (0.7mcg/kg/h) to achieve Ramsay sedation score 5/6

Table 1: Characteristics (n=21)

Age, years	76.7±14.7
Male/Female Ratio (n)	2.5 (15/6)
Body mass index, kg/m ²	23.3±3.0
Total dose of sadatives	
Fentanyl, mcg/kg	1.9± 0.49
Midazolam, mg/kg	0.014± 0.005
Dexmedetomidine, mg/kg	0.28± 0.10

(mean±SD)

Table 2: AHI and predominant breathing route during sedation

	Before insertion of endoscopy	During insertion of endoscopy
*p<0.05		
Study time, min *	13.5±3.4	38.3±17.7
AHI, hour ⁻¹ *	16.1±12.0	10.8±11.4
Breathing route, % of the study time		
Oral	3.4±11.1	0.7±1.7
Oronasal *	25.6±34.5	86.8±28.7
Nasal *	78.3±34.8	12.4±28.8

(mean±SD)