The coordination of breathing and swallowing during hypercapnia in rats
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Introduction.— The pharynx is a common organ for both swallowing and breathing. Their coordination is important to avoid pulmonary aspiration and is characterized mainly by the occurrence of swallowing during expiration.

Objective.— The aim of this study was to investigate the effect of hypercapnia on swallowing function as well as on the coordination swallowing–ventilation in unrestrained animal.

Methods.— The study was carried out on 20 Wistar rats (2–3 months, 275–300 g) sub-divided in two groups (G1: exposed to ambient air; G2: exposed to 10% CO2) using whole-body plethysmography and video recordings. The rats were given water via a baby bottle fitted with a nipple after 24 h without drinking. The experiment was continued until rest ventilation and swallowing periods were identified on the video recordings.

Results.— In healthy animals during swallowing, we observed a decrease in total ventilatory time (TTOT), a decrease in inspiratory time (TD) (P < 0.001), a decrease in expiratory time (TE) (P < 0.001), no change in tidal volume (VT) and an increase in mean inspiratory time (VT/TI) (P < 0.05) compared to the rest period. Animals exposed to 10% CO2 presented during swallowing a decrease in VT (P < 0.05), no change in VT/TI, TTOT and TI and an increase in TE (P < 0.05). Swallow frequency and swallowing characteristics based on ventilation change in group exposed to hypercapnia. Swallows during expiration decreased (84%, P < 0.05) while swallows during inspiration increased (26%, P < 0.05).

Conclusion.— These results confirmed the coordination ventilation–swallowing in rats exposed to ambient air and suggest that the de-glutition and the coordination of swallowing and ventilation may be compromised during hypercapnia.

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Stroke and swallowing disorders: Clinical assessment
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Introduction.— Swallowing disorders are common (about 50%) and lead to serious problems post-stroke (pneumonia and death) but is so regressive. The initial assessment must induce an efficient management (decision of feeding adaptation of non oral feeding) Physical signs and ingestion test consist of main approaches of bedside screening of aspiration.

Assessment.— Patients were assessed using three swallowing assessments (clinical tests without feeding, feeding tests or combined tests). A clinical examination allows the research of predictive signs correlated with aspiration at the videofluoroscopic examination. This clinical scale (CPAS) observes velar reflex and gag reflex, arachic reflex, faulty voluntary laryngeal closure, faulty voluntary swallow, dysphonia or dysarthria, meal reduced of 50% on three consecutive times, increased time of meal (> 30 minutes). Clinical examination alone has a poor sensitivity (58.3%). A feeding test appears to be necessary like the 3-ounce Water swallow Test (sensitivity of 76%). The combined screening schema, Practical Aspiration Screening Scheme (PASS), consisted of a 3 oz WT to enhance results of the uncertain of CPSA and show a sensitivity at 89.1% [1].

Conclusion.— Combined schema enhances the efficiency of bedside screening of aspiration.

Reference

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Study of the validity of cervical auscultation during the learning phase of a swallowing test to screen inhalations
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Does cervical auscultation allow the therapist a less probabilistic approach in detecting silent aspiration? The objective of this study was to compare in terms of aspiration detection predictive values of the test of swallowing with and without cervical auscultation, the reference test is fluoroscopy swallowing. Sixty-four patients were hospitalized for an assessment of swallowing in the Unity of Voice and Swallowing Service ENT Hospital Larrey. Each patient underwent radioscopic examination by a physician who did not know the results of tests performed previously by two students in speech therapy. For each
patient, a student performed the test of swallowing one another and the same test associated with cervical auscultation. The alternation between students for the test is performed with or without auscultation eliminates the "test effect". No information was communicated between students among themselves and with the doctor.

The results are presented in the form of ROC curves established according to the use or not of auscultation during the test food. Cervical auscultation does not change the area under the curve. The trend is even reversed with a decrease in performance with the severity of silent aspiration.

Thus, auscultation did not improve the performance of the test food in terms of predicting aspiration in the learning phase of swallowing tests by two students in speech therapy. The same study is now complete with experienced pathologists.

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Efficiency of cough: Maximum phonation time: Bedside assessment
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Introduction.– This study aimed to assess cough effectiveness after a stroke and to propose a bedside screening test.

Design.– Patients who had had ischemic hemispheric stroke were recruited and followed-up for 2 mos. Maximum phonation time (MPT) was assessed during the first 10 days. Aspiration was evaluated on days 2 and 10 after stroke. Lung function testing was performed on day 10. Peak cough flow less than 160 L/min was defined as the criterion for cough ineffectiveness. Correlation between peak cough flow and MPT was determined, and the optimal cut-off value relating MPT to effective cough was determined using receiver operating characteristic analysis when referring to peak cough flow.

Results.– Of the 70 patients, six developed pneumonia (mean time, 1.7 ± 2.4 days). Lung function assessment in 32 cases revealed general reduced cough effectiveness. MPT was correlated with peak cough flow (r = 0.413, P = 0.025), and an MPT cut-off of 10 s was identified. Forty-seven patients were able to perform MPT on day 2; 49 were able to perform on day 10. Patients with MPT of 10 s or longer had less frequent aspiration on both day 2 (5.9% vs. 36.7%, P = 0.034) and day 10 (2.9% vs. 26.6%, P = 0.026).

Conclusions.– Cough effectiveness was reduced at the time of greatest risk for pneumonia. MPT provides a reliable bedside screening test of cough effectiveness.

Further reading

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Neuromuscular electrical stimulation (NMES) in head and neck cancer patients treated by radiation therapy with dysphagia
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Twelve patients were randomized for NMES and 13 for TT. Inclusion criteria were:
– patients treated by radiation therapy ± surgery for an head and neck cancer;
– a delay more than 3 years after the end of treatment;
– no recurrence of the disease;
– ability to swallow.

Pre- and post-trial measurements were videoradiographic swallowing evaluation, nutritional status, oral motor function test, and a self-questionnaire (Deglutition Handicap Index [DHI]). All subjects received 15 therapy sessions. Statistically significant positive therapy effects for both NMES and TT combined were found only on the self-questionnaire (DHI). In two cases we observed a worsening on the videofluoroscopic probably despite this result. These results leads to precise the indication of the NMES technique apply to swallowing disorders.

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