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Swallowing Study Using Water-soluble Contrast Agents Increases Aspiration Sensitivity and Antedates Oral Feeding without Respiratory and Drug Complications: A Prospective, Observational, Case-control Trial

Chang Ho Hwang[1]

[1]Department of Physical and Rehabilitation Medicine, Chungnam National University Sejong Hospital, Chungnam National University College of Medicine, Sejong, Republic of Korea

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Chang Ho Hwang

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MATERIALS TEXT

Based on their medical conditions and aspiration risk, patients undergoing the swallowing study were assigned to iohexol 350 (Omnipaque® [osmolarity 541 mOsm/L, viscosity 10.4 centipoise at 37°C, specific gravity of 1.406], GE Healthcare, USA)[19] or barium sulfate ($BaSO_4$ 40% [osmolarity 233 mOsm/L, viscosity 2.3 centipoise at 25°C]) as the CA.

Patients with a history of iodine allergy underwent MBSS. All patients were evaluated by a physiatrist with an intra-rater reliability of oropharyngeal swallowing efficiency of 0.87. The demographic and clinical characteristics of all patients were collected, including underlying diseases, performance of tracheostomy, feeding methods, radiologic findings before and after the swallowing study, total hospital stay, and days to discharge. Results suggesting pneumonitis, pulmonary edema, allergic responses, or chemotoxicity-related laboratory/vital findings were collected over 1 week after the evaluations. Radiologic change was interpreted by six independent radiologists.

If present, Levin tubeswere removed > 4 hours before the evaluations and oxygen was provided, as requested. Based on the penetration-aspiration scale, aspiration was defined as CA passing below the vocal folds.[23] Patients were asked to sit in a wheel-chair with neutral neck, erect trunk, hips and knees flexed to 90 degrees, and feet in contact with the floor. Patients were allowed to grip a safety bar, or assistants held their trunk, if necessary. Patients were assessed in lateral and/or anterior-posterior view using a fluoroscope (Shimavision 3500 HG, Shimadzu, South Korea). MBSS was performed according to the modified Logemann protocol; nectar-thick liquid was first evaluated and pureed, yielding semi-solid and solid test diets, and finally juice-thick liquid.[24]WSS was performed using Hwang's protocol, consisting of juice-thick liquid and thenpureed, semi-solid and solid diets. The amount of each material depended on the results of preceding analyses.

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