Dr. Peter Michael Baptista Jardín, MD, PhD; Otolaryngology Department, Clinica Universidad de Navarra
Tarek Ajami Fardoun; Sixth Year of Medical School, University of Navarra

Drug Induced Sleep Endoscopy for the Evaluation of the Upper Airway Collapsibility in Patients with OSAS

1 Introduction

- Obstructive sleep apnea syndrome is defined as the cessation of airflow during sleep, with the presence of respiratory effort.
- Although CPAP is the first line treatment in OSAS, some patients may need to undergo a surgical correction of the upper airway.
- DISE (drug induced sleep endoscopy) is introduced as a diagnostic tool to obtain dynamic information regarding the collapsibility of the UA.
- The objective of this study is to describe the findings of this exam in patients with OSAS, and to find a correlation with polysomnographic (PSG) outcomes.

2 Study Design

- The cohort is composed of 102 patients. Included individuals had failure of medical OSA therapy or failure of previous surgical therapy.
- Polysomnography is done prior to DISE procedure. The study was conducted in ORL department at the Clinica Universidad de Navarra, Pamplona, Spain.

3 DISE Procedure

- DISE is performed in outpatient setting in endoscopy room by Dr. Peter Baptista. All patients had basic cardio-respiratory monitoring.
- The anesthesiologist administered propofol in continuous infusion in order to induce sleep. Once snoring or upper airway (UA) obstruction appear, the visualization of the UA is proceeded by nasopharyngeal fiberscope (Olympus ENF type P4).
- Assessment of the UA is classified as indicated in fig.1. The analysis included primary obstruction site, the individual site responsible for the obstruction, the degree and the direction of obstruction.

4 DISE Findings

- Based on upper airway analysis, multilevel obstruction is the most frequently observed. (fig.2).
- Soft palate is the predominant structure in velopharyngeal collapse (fig.3) and so is the tongue base in the hypopharyngeal collapse (fig.4).
- We found that higher AHI values are present when UA is completely collapsed at one or more level compared to incomplete one (fig.6D). Higher BMI values are also associated with bileveled complete obstruction. (fig.6C).
- We also reported significant correlation between AHI values and the severity of overall and palatal obstruction, but not with hypopharyngeal collapse.

5 Association with PSG Results

- Findings of DISE are analyzed according to BMI and polysomnographic parameters: AHI (apnea/hypopnea index), minimal oxygen saturation and mean apnea period.
- Hypopharyngeal collapse is significantly associated with lower oxygen saturation and higher apnea period time compared to other obstruction sites (p<0.05). (fig.6A,B)
- We found that higher AHI values are present when UA is completely collapsed at one or more level compared to incomplete one (fig.6D). Higher BMI values are also associated with bileveled complete obstruction. (fig.6C).
- We also reported significant correlation between AHI values and the severity of overall and palatal obstruction, but not with hypopharyngeal collapse.

6 Conclusions

- Multilevel obstruction is the most frequently reported in our analysis as well as in other studies. Hypopharyngeal collapse seems to be more influential in oxygen saturation and the duration of apnea periods than any other collapse.
- DISE has a significant correlation with PSG findings. Higher degrees of obstruction are found in patients with severe OSAS and higher obesity level.
- We confirm that DISE is a safe procedure, and it is likely to become more relevant as OSAS surgery continues to evolve. It provides useful, dynamic, reliable and valid information regarding the obstruction of the UA. Such characteristics are important for a better choice of OSA treatment.
- Further classification of UA obstruction is needed to standardize the DISE technique, indications, assessment and interpretation. The value of DISE should be evaluated in predicting the results of therapies.

7 References


Contact: Tarek Ajami Fardoun Email: tajami@alumni.unav.es

Fig 1: Assessment of the upper airway

Fig 2: Frequency of obstruction types

Fig 3: Distribution of velopharyngeal obstruction sites

Fig 4: Distribution of hypopharyngeal obstruction sites

Fig 5: Examples of UA collapse

Fig 6: Association between DISE findings and PSG outcomes. *p<0.05 **p<0.01

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