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Obstructive respiratory events during procedural sedation and analgesia: Another WHY to routinely screen for sleep apnea before catheter ablation of atrial fibrillation

Increasing number of complex catheter ablation (CCA) procedures for the treatment of atrial fibrillation (AF) by radiofrequency catheter or cryo-balloon based techniques are performed under procedural sedation and analgesia (PSA). Compared to general anaesthesia, moderate PSA during CCA for AF is associated with shorter total laboratory and turn-over times without compromising the success rates [1]. A short procedure time and a fast recovery from PSA allows performing CCAs as one day case procedures, which is now implemented in multiple high throughput centers [1]. Although the use of respiratory depressants (e.g. midazolam, opioids) during PSA increases the risk of obstructive respiratory events due to collapse of the upper airways [2,3], real-time monitoring of upper airway obstructions during CCAs has not been widely established.

In this issue of the *International Journal of Cardiology Heart & Vasculature*, Iwasaki et al. evaluated esophageal pressure monitoring for respiratory management during CCA in twenty-four consecutive patients with AF who underwent esophageal pressure monitoring during catheter ablation for AF [4]. Patients who showed obstructive apneas during the procedure exhibited a substantial negative esophageal pressure and desaturations as compared to patients who did not show obstructive events (−41 vs. −12 mmHg). Airway management immediately resolved the negative esophageal pressure along with a recovery from desaturation. This esophageal pressure monitoring, as introduced by Iwasaki et al., has been shown to be a simple, affordable and effective method for the evaluation and management of obstructive respiratory events during CCA.

A wider implementation of real time monitoring of obstructive respiratory events may allow early detection and prevention of obstructive respiratory events during PSA around rhythm control procedures such as CCA and electrical cardioversion. This is crucial given that ineffective inspiration against obstructive upper airways increases the occurrence of vulnerability for reinduction of AF by sympathovagal imbalance [5,6]. Obstructive respiratory events during PSA are associated with increased occurrence of premature atrial contractions and more early relapse of AF after cardioversion [7]. Additionally, forced breathing movements during obstructive respiratory events result in pronounced intrathoracic pressure swings, which may result in shifts of the electro-anatomical maps and might cause serious complications including air embolisms and cardiac tamponade [2,3].

There are several observations suggesting that it might be possible to identify patients who are likely to develop obstructive respiratory events during PSA by means of a simple ambulatory sleep apnea test. AF patients with obstructive respiratory events during PSA around electrical cardioversion also show a high prevalence of sleep apnea and obstructive respiratory events (apneas and hypopneas) during sleep [7]. In current international AF management guidelines, sleep apnea treatment is recommended as an important component of comprehensive risk factor management in AF patients to improve success rates of heart rhythm control strategies and prevent AF progression [8].

The implementation of sleep apnea testing in AF outpatient clinic infrastructures remains to be a big challenge. Although it has been reported that sleep apnea is present in up to 70% of patients in systematically tested AF populations, sleep apnea remains to be largely underestimated [9]. Most AF patients report low daytime sleepiness levels, which often precludes them from being investigated for the potential presence of concomitant sleep apnea and reduces the accuracy of available screening questionnaires to identify sleep apnea in AF patients [10,11]. Of note, as cleary shown by a recent joint survey by the European Heart Rhythm Association (EHRA) and the Association of Cardiovascular Nurses and Allied Professions (ACNAP), structured testing for sleep apnea only occurs in the minority of AF patients as the access to polysomnography in a sleep-laboratories is limited due to long waiting lists, high labor intensity and high costs [12]. Recently, multidisciplinary and integrated approaches have been developed to allow implementation of structured characterization of comorbidities such as obesity, COPD and sleep apnea before AF ablation procedures [13–19].

The attempt to predict the risk of obstructive respiratory events during PSA might be another reason to perform structured sleep apnea testing in AF patients scheduled for CCA to allow a personalized and informed PSA management. If obstructive respiratory events are observed during PSA, a sleep and pulmonary work-up should be triggered to exclude modifiable conditions such as sleep apnea and COPD, which individually have been shown to contribute to AF progression [3,14]. Future randomized studies are warranted to test the impact and cost effectiveness of systematic pre-procedural sleep apnea testing to identify those patients likely to develop obstructive respiratory events during PSA.

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