

Editorial

Undiagnosed sleep apnea in patients with atrial fibrillation: An underutilized opportunity for antiarrhythmic management



Sleep-disordered breathing (SDB), of which obstructive sleep apnea is the most common subtype, has been shown to be highly prevalent in patients with atrial fibrillation (AF) [1]. The arrhythmogenic mechanisms of SDB facilitating AF include nocturnal high-frequency desaturation and reoxygenation, intrathoracic pressure changes and sympathovagal activation [2]. This provokes progressive structural atrial remodeling in long-term SDB, creating a complex and dynamic substrate for AF. Therefore, concomitant SDB and AF is associated with lower success rates of anti-arrhythmic therapy with increased risk of AF recurrence [3].

Sleep apnea in patients scheduled for AF ablation is highly underdiagnosed. The OSA-AF study, published in the current edition of the IJC Heart & Vasculature, focused on the association of undiagnosed SDB on the outcome of AF catheter ablation in 164 patients [4]. After exclusion of patients with previously diagnosed SDB ($n = 30$), 104 of 134 eligible patients were enrolled and underwent SDB screening. The median AHI was 11.5 (interquartile range 6.8–21.9) and 39 patients (38%) had SDB which was undiagnosed during the first year after ablation. AF recurrence in the first year after catheter ablation occurred in 40 patients (38%). The risk of AF recurrence was higher in the group with undiagnosed SDB in comparison to those without SDB (51% versus 31%, $P = 0.04$). Interestingly, the prevalence of AF recurrence was similar between patients with previously diagnosed and undiagnosed SDB (51% versus 50%, $P = 0.92$). This study shows that a significant proportion of patients undergoing catheter ablation of AF have undiagnosed SDB which is associated with a twofold higher risk of AF recurrence. Given the high prevalence and negative prognostic factor on AF outcomes, undiagnosed SDB is an underutilized modifiable AF risk factor and component of antiarrhythmic management. However, identifying SDB is difficult as most patients with AF do not report typical SDB-related symptoms as daytime sleepiness [5]. Self-reported questionnaires on SDB-related symptoms, even if combined with basic clinical characteristics, seem insufficient in detecting SDB in AF patients [5]. Additionally, a joint survey by the European Heart Rhythm Association (EHRA) and the Association of Cardiovascular Nurses and Allied Professions (ACNAP) recently identified a number of challenges occur in SDB management in patients with AF. A majority of health care professionals reported a missing collaboration between cardiology and sleep clinic as well as lack of financial and personnel related resources as major barriers in a systematical SDB screening [6]. Further, access to polysomnography (PSG) based SDB screening, the current gold-standard, is limited due to various reasons. Polygraphy based home sleep testing may be a solution, as recent studies showed a high to fair sensitivity in detecting SDB when compared to PSG [7]. Remote home SDB testing can

herein provide accessible and reliable results with lower costs compared with conventional polysomnography [8]. This can promote early detection and treatment of SDB in patients with AF. The relative cost of this approach could be justified by the benefits of improved treatment efficacy, which reduces medical and economic burden (see Fig. 1).

The clinical challenge that remains is, however, identifying which patients need to be selected for SDB-screening. Current international AF management guidelines recommend identification and treatment of OSA in confirmed cases to help maintain sinus rhythm. However, specific recommendations concerning when and how to test for SDB, remain uncertain. A systematic testing by home sleep test or respiratory polygraphy as well as structured SDB management pathways are often not established [6]. The high prevalence and the negative prognostic effect of undiagnosed SDB on treatment efficacy in AF patients indicates a potentially high number of patients for SDB screening. Even with more cost effective and accessible SDB screening solutions, as for example home sleep tests, a pre-selection might therefore be necessary. We propose the assessment of pre-test probability of SDB based on SDB-related and clinical characteristics to further guide patient selection for SDB screening [2]. However, evidence is needed for which patient characteristics or reported symptoms SDB screening is indicated in patients with AF. SDB screening can be reasonable in every patient who is experiencing SDB related symptoms. However, patients with difficult to treat hypertension or high AF symptom burden/AF recurrence can also benefit from SDB screening, as these conditions can be symptoms or consequences of SDB [9]. Within AF patients, these might more often be patients who are scheduled for AF ablation or other rhythm control strategies, as investigated by the authors of the OSA-AF study, published in the current issue [4]. However, the authors did not investigate consecutive AF patients and no prospective data was collected yet. Also, recent studies have demonstrated that OSA-severity exhibits considerable night-to-night variability, particularly in patients with cardiovascular disease, which cannot be detected by one overnight sleep assessment [10].

The implementation of SDB screening and management in AF clinics requires a close interdisciplinary collaboration between the cardiologist and sleep specialists, ideally within an integrated care approach. Examples of integrated, multidisciplinary pathways for detection and treatment of SDB in patients with AF are slowly emerging. Previously, a virtual remote management pathway incorporating a mobile-health based overnight home sleep test was introduced in two AF outpatient clinics in the Netherlands⁸. Integrated care pathways in this case can enable an interactive structured follow-up to assess AF burden, disease progression, and treatment efficacy. Simultaneously, the interactive

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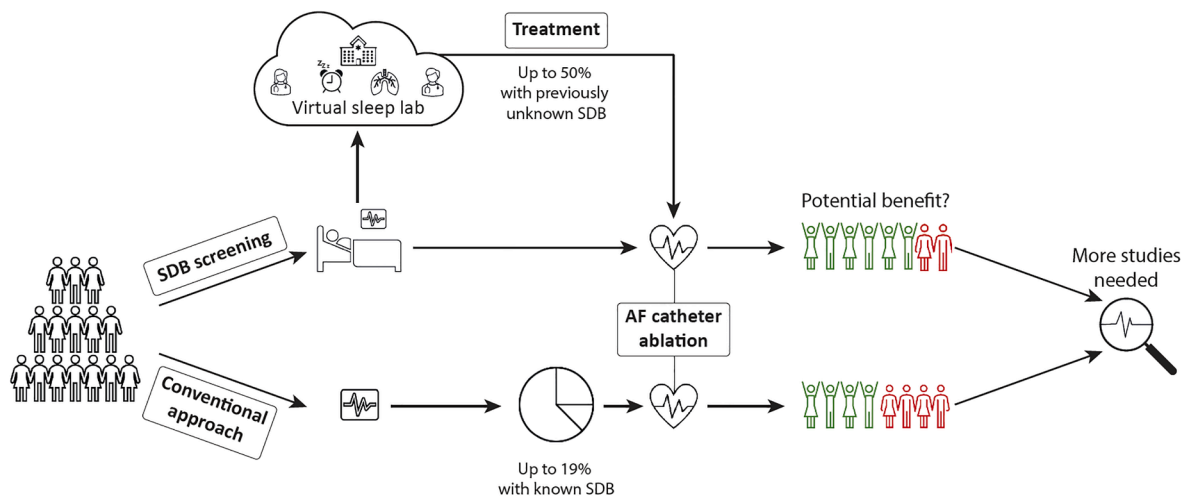


Fig. 1. Comparison of routine sleep-disordered breathing (SDB) screening versus routine care.

feedback between patient and clinician may induce treatment success by empowering patient self-management through education. The majority of patients is not aware of the negative prognostic effects of SDB on AF⁸. Educating and engaging patients supports informed decision making and adherence to treatment. Lifestyle intervention programs, such as sleep hygiene, alcohol abstinence and weight loss, could also be implemented as a component of the structured follow-up. Collectively, AF-SDB digital and remote monitoring tools may allow patient-tailored management decisions.

Although the required technologies are available, implementation of SDB screening in AF clinics is complicated by lack of infrastructure and inflexible reimbursement models. SDB can probably be considered the most expensive cardiovascular risk factor in terms of its assessment. Management trials justifying SDB-screening and consecutive management are required to firmly establish the role of SDB treatment in AF management guidelines and thereby promote implementation in AF clinics. A systematical SDB screening approach can be considered relevant for patients with high AF symptom burden or patients who report SDB related symptoms. However, until certain clinical and economic barriers in establishing a systematical SDB screening can be overcome, pre-selection models should be investigated and improved.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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