INCIDENCE OF SEVERE SLEEP APNEA AND ITS ASSOCIATION WITH ATRIAL FIBRILLATION IN PACEMAKER PATIENTS

Results from the Respire Study

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BACKGROUND & OBJECTIVE

Sleep Apnea Syndrome (SAS) is characterized by repeated episodes of reduced (hypopnea) or absent (apnea) airflow causing oxyhemoglobin desaturation with potential deleterious impact on the cardiovascular system.

The purpose of the RESPIRE study was to **assess the association between severe Sleep Apnea (SA) and AF in an unselected population with dual chamber pacemakers equipped with the Sleep Apnea Monitoring (SAM) feature.**[1]

METHOD[1]

Study design

- RESPIRE is an **observational**, multicenter, international, prospective, single arm and open label study.
  A total of **1147 patients** were enrolled at 98 centers in Europe. Patients were followed for 18 months after implant.

Sleep Apnea Monitoring (SAM) algorithm

- The sleep apnea monitoring (SAM) algorithm detects respiratory disturbances using measurements of the transthoracic impedance.
- SAM provided, for each night, the respiratory disturbance index (RDI).
  The Dream study showed that an RDI >20 with the SAM feature was equivalent to an Apnea-Hypopnea Index (AHI) >30 with polysomnography to identify severe Sleep Apnea patients.

ENDPOINTS & RESULTS[1]

The SAM algorithm was enabled in 1024 implanted patients.

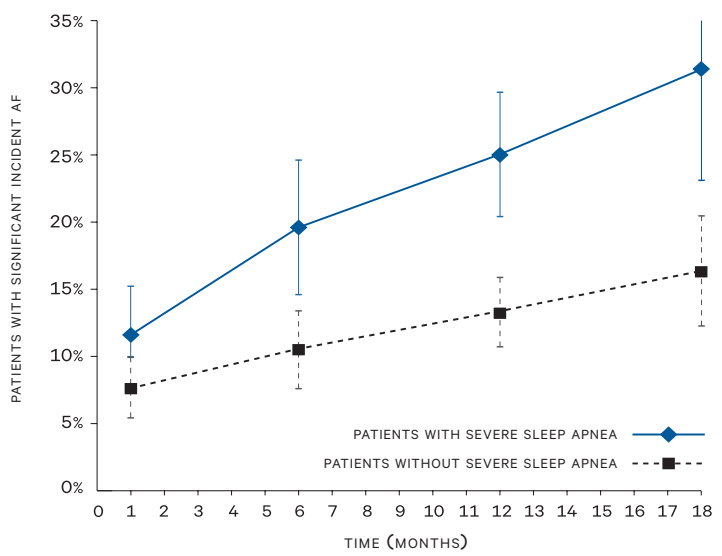
553 subjects had at least 80% of valid nights and were considered for the first co-primary endpoint analysis at 12 months.

The second co-primary endpoint was evaluated in 312 subjects with severe SA and 712 subjects without at 18 months.

ENDPOINTS	RESULTS
• **The first co-primary endpoint** was to evaluate the incidence of significant AF in patients with severe SA compared to those with non-severe SA after 12 months*.	→ Severe SAS was identified in 172 patients (31.1%). 43 patients (25%) with severe SA had AF compared to 53 patients (13.9%) without severe SA, a difference of 11.1%. Severe SA and AF at baseline were the only predictors of significant AF.
• **Second co-primary endpoint** was to evaluate all major serious adverse events — death, myocardial infarction, stroke and re-intervention — that occurred in patients with severe SA and in those without severe SA over 18 months.	→ A significant difference of 2.7% in death was observed in the group with severe SA (312 patients) compared to the group with non-severe SA (712 patients). No intergroup difference in the overall rate of major serious adverse events was observed.
• **Other endpoints** included the development of significant AF and persistent AF* from implant up to 1, 6, 12 and 18 months, according to SA severity.	→ Severe SA was both a predictor of significant AF in patients with a history of AF and a predictor of new-onset significant AF in patients without a history of AF.

IDENTIFICATION OF SIGNIFICANT AF

Identification of significant AF (cumulative AF episodes lasting ≥ 24 hours over 2 consecutive days) over time in patients with or without severe sleep apnea in the modified intention-to-treat population. AF = atrial fibrillation.



**Significant AF was defined as cumulative AF episodes lasting ≥24 hours over 2 consecutive days on the basis of the duration of fallback mode switch.*
Persistent AF was defined as an AF episode lasting for more than 7 consecutive days.
Sleep apnea severity was defined according to average RDI from implant to follow-up visit (ie, 12 or 18 months): a value ≥20 was classified as severe SA, and RDI <20 was classified as non-severe SA.

— RESULTS FROM THE RESPIRE STUDY —

Incidence of severe sleep apnea and its association with atrial fibrillation in pacemaker patients.

DISCUSSION[1]

RESPIRE is the largest study to date that has employed the SAM algorithm to investigate the association between SA and AF in a dual chamber pacemaker population.

- Severe SA is associated with close to double the risk of significant AF and with increased risk of persistent AF. The incidence of these atrial arrhythmias increases more rapidly in severe SA patients over time.
- The association of severe SA and AF was also shown in other studies. In the Sleep Heart Health study[2], the risk of AF was 5 fold higher. Also, Mazza et al[3] showed pacemaker patients with severe SA have twice the risk of AF.
- Given the high rates of SA in pacemaker patients,[4,5] and the association between SA and AF, employing pacemaker algorithms to identify both SA and arrhythmia seems an appealing initial screening option.
- Device based monitoring allows for nightly screening of SA and may thus better reflect the real prevalence of severe SA.

References

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CONCLUSION[1]

RESPIRE found an approximate **doubling** of the rate of clinically significant AF in pacemaker patients with severe SA compared to patients without severe SA.

These results indicate that pacemakers with SA detection algorithms may have a useful role as a screening tool in pacemaker patients at risk of arrhythmia-associated events.

MICROPORT CRM

In the Dream study[6], SAM™ is validated against polysomnography to identify severe Sleep Apnea.

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