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Title

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Permalink

<https://escholarship.org/uc/item/060876z8>

Journal

The Lancet, 392(10142)

ISSN

0140-6736

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Publication Date

2018-07-01

DOI

10.1016/s0140-6736(18)31381-3

Peer reviewed



HHS Public Access

Author manuscript

Lancet. Author manuscript.

Published in final edited form as:

Lancet. 2018 July 14; 392(10142): 160. doi:10.1016/S0140-6736(18)31381-3.

Continuous positive airway pressure device detects atrial fibrillation induced central sleep apnoea

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A 64-year-old male physician with obstructive sleep apnoea presented for a scheduled outpatient follow-up appointment. He reported that the week before he had developed palpitations and shortness of breath, and was diagnosed with atrial fibrillation. Information downloaded from his continuous positive airway pressure (CPAP) device showed excellent adherence and a residual apnoeahypopnoea index (AHI) of 2.8 events per h. Closer inspection of the information for the evening of the arrhythmia on Oct 3, 2017, showed a significant increase in the nightly residual AHI, a predominance of central sleep apnoea episodes, and a crescendo-decrescendo pattern of airflow consistent with classic Cheyne–Stokes respiration (figure). The AHI measured on the CPAP device subsequently returned to normal after successful cardioversion the following day, Oct 4.

Non-hypercapnic central sleep apnoea occurs when a stimulus triggers hyperpnoea and a fall in the arterial partial pressure of carbon dioxide below the apnoeic threshold, resulting in the cessation of breathing. Central sleep apnoea, specifically Cheyne–Stokes respiration, is commonly seen in heart failure, and may result from stimulation of the respiratory centres by increased left atrial pressure, which can occur acutely with the onset of atrial fibrillation.

Increasingly, medical devices such as home CPAP devices provide long-term patient monitoring. However, interpretation of resulting data presents both opportunities and challenges for clinicians.

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Contributors

ML and RLO obtained and analysed the clinical data and made the figure. We all contributed to editing the figure, and writing and editing the text. Written consent from the patient for publication was obtained.

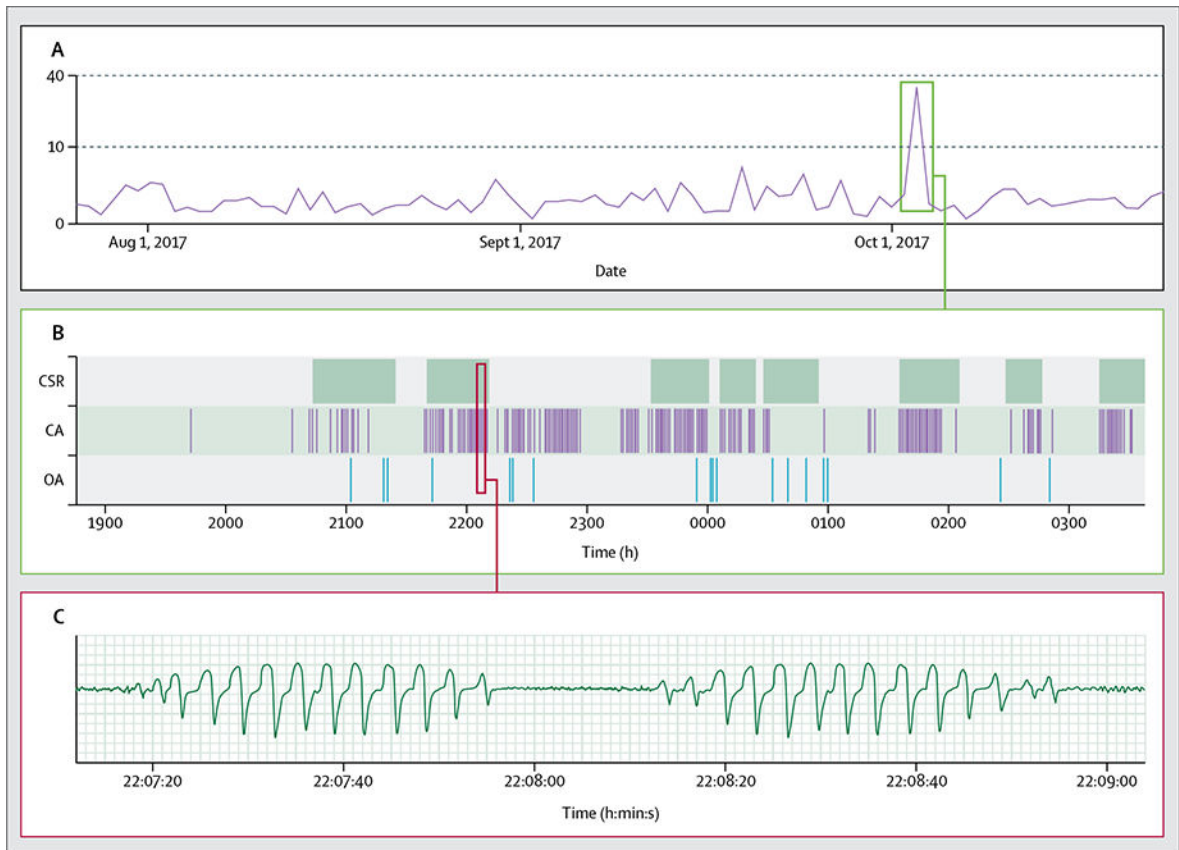


Figure: Atrial fibrillation induced central sleep apnoea

Nightly machine measured apnoea-hypopnoea index over a 3-month period (A). Data from Oct 3, 2017, shows predominantly central apnoeas with 20·6 events per h (in purple) and more than 3·5 h of suspected Cheyne–Stokes respiration (in green). Obstructive apnoeas are shown in blue (B). Expanded flow tracing from just after 2200 h shows a crescendo-decrescendo pattern of airflow and a period of approximately 1 min consistent with classic Cheyne–Stokes respiration (C). CSR=Cheyne-Stokes respiration. CA=central apnoeas. OA=obstructive apnoeas.