Characteristics of Asthma-related Nocturnal Cough: A Potential New Digital Biomarker

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Introduction
The nature of nocturnal cough is largely unknown. It might be a valid marker for asthma control but very few studies characterized it as a basis for better defining its role and its use as clinical marker. This study investigated prevalence and characteristics of nocturnal cough in asthmatics over the course of four weeks.

Methods
In two centers, 94 adult patients with physician-diagnosed asthma were recruited. Patient-reported outcomes and nocturnal sensor data were collected by a smartphone with a chat-based study app.

Results
Patients coughed in 53% of 2212 nights (range: 0-345 coughs/night). Median coughs per hour were 0 (IQR 0-1). Nocturnal cough rates showed considerable inter-individual variance. The highest counts were measured in the first 30 min in bed (4.5-fold higher than rest of night). Eighty-six percent of coughs were part of a cough cluster. Clusters consisted of a median of two coughs (IQR 2-4). Nocturnal cough was persistent within patient.

Conclusion
To the best of the authors’ knowledge, this study is the first to describe prevalence and characteristics of nocturnal cough in asthma over a period of one month, demonstrating that it was a prevalent symptom with large variance between patients and high persistence within patients. Cough events in asthmatics were 4.5 times more frequent within the first 30 min in bed indicating a potential role of positional change, and not more frequent during the early morning hours. An important next step will investigate the association between nocturnal cough and asthma control.

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