

## The Taiwanese Adult Asthma Patients Had Increased Sleep Apnea Risk

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**Objective:** Asthma is a chronic airway inflammatory disease, mainly driven by allergic reactions. The allergic reactions might also affect the upper airway, causing allergic rhinitis and remodeling of the upper airway, which might predispose the patients to sleep apnea. We performed a nationwide population-base cohort study using Taiwan National Health Insurance (NHI) Research Database (NHIRD) to determine the association between asthma and sleep apnea (SA) in Taiwan.

**Methods:** Using Taiwan National Health Insurance (NHI) database of one million representative subjects randomly sampled from individuals enrolled in the NHI system in 2005, we enrolled adult patients having asthma and excluded those having a diagnosis of SA prior to asthma. The dates of their first asthma diagnosis were defined as their index dates. Each asthma patient was matched to 10 randomly selected, age- and sex-matched control subjects without any asthma diagnosis. The control subjects were assigned index dates as their corresponding asthma patients, and were ensured having no SA diagnosis prior to their index dates.

**Results:** Totally, 41,876 patients with asthma were matched to 418,760 control subjects. The incidence rate of SA was significantly higher in asthma patients as compared with the corresponding control subjects (0.5 vs. 0.9 per 1000 patient-year; adjusted incidence rate ratio = 1.8 [95% CI: 1.7-1.8],  $p < 0.0001$ ). The cumulative incidence of SA was also significantly higher in the asthma patients ( $p < 0.0001$ ). In multivariable Cox regression analysis, asthma remained a significant risk factor for the development of SA after adjusting for age, sex, residency, income level and comorbidities (hazard ratio = 1.8 [95%CI: 1.6-2.0],  $p < 0.0001$ ). In asthma patients, risk factors for incident SA included male, living in Northern Taiwan, higher income, and liver disease.

**Conclusion:** We found that the patients with asthma had higher risk of SA. Therefore, for patients with asthma, clinicians need to pay attention to the risk of incident SA, especially for male patients living in Northern Taiwan with higher income and liver disease.

中文題目：台灣成年氣喘病人有較高的睡眠呼吸中止症風險

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