

## A retrospective study of risk factors associated with acute ischemic stroke in combined obstructive sleep apnea syndrome

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**Background:** Acute Ischemic Stroke (AIS) is often accompanied by Obstructive sleep apnea syndrome (OSAS), which has a great impact on morbidity and mortality. There is a close relationship between AIS and OSAS. In this study, we explored the effects of different risk factors on AIS with OSAS and AIS with different severity of OSAS and the mechanisms within them.

**Materials and Methods:** A total of 126 patients who were hospitalized in 958 hospital of PLA ARMY from January 2019 to December 2022 and diagnosed with AIS were included. The 122 patients were divided into AIS alone group (control group, n=24) and AIS combined with OSAS group (observation group, n=98). The OSAS group was divided into three subgroups according to the OSAS classification criteria: 23 patients in the mild group, 25 patients in the moderate group, and 50 patients in the severe group. The National Institute of Health Stroke Scale (NIHSS) was scored and recorded for all patients, and the Adams classification was performed using cranial CT or magnetic resonance imaging, and carotid ultrasound was performed to clarify the presence or absence of carotid artery plaques, which was determined according to the carotid artery plaque score. Scoring was performed and the score was recorded. The general information of the patients, sleep apnea monitoring report, and relevant serologic indexes were recorded. The collected information was statistically analyzed for comparative differences between groups, correlation analysis, univariate and multivariate logistic regression analysis.

**Results:** There were significant differences between the AIS group and the AIS with OSAS group in terms of CRP, plaque grade score and plaque characteristics ( $P<0.05$ ), and in terms of CRP and HDL-C ( $P<0.01$ ). One-way logistic regression analysis showed that BMI was a risk factor for AIS combined with OSAS (OR=1.19, 95% CI=1.05-1.39,  $P<0.05$ ) and plaque grade score was a risk factor for AIS combined with OSAS (OR=1.66, 95% CI=1.14-2.24,  $P<0.05$ ). Further multifactorial Logistic regression analysis showed that independent influences of AIS combined with OSAS included CRP (OR=1.29, 95% CI=1.09-1.67,  $P<0.05$ ), and HDL-C (OR=0.01, 95% CI=0-0.12,  $P<0.01$ ). In addition, BMI ( $r=0.412$ ,  $P<0.01$ ), CRP ( $r=0.5$ ,  $P<0.01$ ), plaque grade ( $r=0.679$ ,  $P<0.01$ ), and age ( $r=0.238$ ,  $P<0.05$ ) were positively correlated with OSAS severity. Correcting for other influencing factors for one-way ordered Logistic regression analysis showed that risk factors for AIS combined with different degrees of OSAS included posterior age (OR=1.34, 95% CI=1.08-1.51,  $P<0.05$ ), hypertension (OR=2.42, 95% CI=1.19-5.12,  $P<0.05$ ), and plaque grade score (OR=3.65, 95% CI=2.54-5.41,  $P<0.01$ ), BMI (OR=1.25, 95% CI=1.13-1.38,  $P<0.01$ ), CRP (OR=1.16, 95% CI=1.06-1.27,  $P<0.01$ ), LDL-C (OR=1.64, 95% CI=1.03-2.63, and  $P<0.05$ ). Multifactorial ordered logistic regression analysis correcting for other influencing factors showed

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that independent risk factors for AIS combined with different degrees of OSAS included BMI (OR=1.18, 95% CI=1.09-1.33, P<0.05), plaque grade points (OR=2.99, 95% CI=1.98-4.5, P<0.01), LDL-C (OR=2.16, 95% CI=1.16-4.04, P<0.05).

**Conclusions:** BMI, CRP and plaque grade score are positively correlated with the severity of OSAS. BMI and plaque grade score are risk factors for AIS complicated with OSAS. BMI and plaque grade score are independent risk factors for OSAS with AIS. CRP is an independent risk factor for AIS with OSAS, which may lead to the occurrence of AIS and OSAS through inflammatory response mechanism, and can predict the severity of AIS and OSAS.

## Biography

Zhang Na, female, born in Chongqing, engaged in neurology department, the main research direction of stroke care

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