The Clinical Characteristics and Relationship between Sleep-Disorder Breathing and Allergic Rhinitis in Children.

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Objective:

Several studies have revealed that allergic rhinitis (AR) contributes to the pathogenesis of sleep disorder breathing (SDB), and a few studies revealed that AR did not affect severity of obstructive sleep apnea (OSA). The impact of AR on OSA and simple snoring is controversial. The aim of this study is to compare the clinical characteristics and polysomnography (PSG) parameter between OSA or simple snoring children with AR and without AR.

Methods:

We retrospectively collected the PSG data of 737 children with SDB, who aged below 12 years old from January 2009 to January 2020 in China Medical University Hospital. Children were divided into four groups according to diagnosis: OSA with AR group, OSA without AR group, simple snoring with AR group, and simple snoring without AR group. Clinical characteristics comprised of sex distribution, age, body weight (BW), body height (BH), body mass index (BMI), body shape and comorbidities when first PSG performing were analyzed and compared by Kruskal-Wallis test and Chi-square test among four groups. Obesity is defined over 95th % of BMI according to new growth curve of Taiwan children and adolescents from Chen & Chang (2010). Furthermore, PSG parameter compared between AR and without AR group in children with OSA or simple snoring were analyzed and compared by Mann Whitney U test. The effect of variables on OSA, AR and obesity were calculated as odds ratios (ORs) with 95% confidence intervals (CIs) using a multiple logistic regression model after confounders adjustment. The model of confounders included age, sex, adenoid-tonsillar hypertrophy, obesity, AR, and asthma. p <0.05 was regarded as statistically significant.

Results:

The prevalence of AR in total children with SDB is 45.7%. There were 266 ,322,71, and 78 children in OSA with AR group, OSA without AR group, simple snoring with AR group, and simple snoring without AR group respectively. The prevalence of AR is

45.2% and 47.7% in children with OSA and simple snoring. Males are predominant in four groups (male vs female: 1.78 vs 3.09). Regarding comparison of four groups, the age in the OSA without AR group was the youngest (6.75) and had the highest percentage of severe OSA (26.71%). OSA with AR group had the highest BMI and obesity prevalence (BMI: 18.47 ± 4.11, prevalence:26.32%), in contrast to simple snoring with AR group, which had the smallest BMI and lowest prevalence of obesity (BMI: 16.78 ± 2.67, prevalence:11.27%). In multiple logistic regression analysis with adjustment for confounders, AR have a low correlation with OSA (OR, 0.9; 95% CI, 0.63-1.; p = 0.59), but obesity was significantly correlated with OSA (OR,1.81; 95% CI, 1.13-2.91; p =0.01) In addition, AR children with obesity, the OR increased significantly.(OR,2.81; 95% CI, 1.28-6.16; p <0.01)

To analyze AR impact in OSA group, non- AR had significantly higher AHI (9.50 vs.7.84, p<0.05), respiratory arousal index (2.28 vs. 2.24, p <0.05), longer stage N1 duration (p<0.05), and shorter stage N3 duration (p<0.05) compared to coexisting with AR. In addition to AR impact in simple snoring group, AR group had significantly shorter stage N3 duration (p <0.05), higher arousal events by spontaneous nature (p <0.05), and lower mean SpO2 (p <0.05) compared to non- AR group.

Conclusion:

AR is a high prevalent comorbidity in children with SDB, but it may not be a major pathogenesis contributes to OSA in children. Children with SBD combined with AR and obesity have significantly high risk to develop OSA subsequently. AR could be an important factor to affect sleep architecture, easily arousal and lower oxygen saturation in children with simple snoring.

中文題目：過敏性鼻炎對於睡眠呼吸障礙兒童之臨床特色與睡眠檢查數據之影響

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