The impact of pediatric tonsillitis in sleep-disordered breathing: a meta-analysis study

Wei-Chieh, Yang [a], Yen-Wen Chen [b], Ping-Tao Tseng [c], Kuan-Ching Wang [d], Pao-Yen Lin [e,f], Meng-Ni Wu [g], Chung-Yao Hsu [g], Mao-Chang Su [h]

[a] Department of pediatrics, DA-AN women and children hospital

[b] Prospect clinic for otorhinolaryngology & neurology

[c] Department of Psychiatry, Tsyr-Huey Mental Hospital, Kaohsiung Jen-Ai's Home, Taiwan

[d] Department of otorhinolaryngology, Cheng Ching Hospital, Taichung

[e] Department of Psychiatry, Kaohsiung Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Kaohsiung, Taiwan

[f] Center for Translational Research in Biomedical Sciences, Kaohsiung Chang Gung Memorial Hospital

[g] Department of Neurology, Kaohsiung Medical University Hospital

[h] Sleep center, Division of pulmonary and critical care medicine, Kaohsiung Chang Gung Memorial Hospital

Objectives：To evaluate the relationship of recurrent tonsillitis and sleep apnea and the treatment effect of tonsillectomy in pediatric group.

Methods：The current meta-analysis consisted of two parts, the first one is to investigate the comorbidity of sleep apnea and pediatric tonsillitis under guideline of meta-analysis of observational studies in epidemiology (MOOSE) and second part of treatment effect of operation in sleep apnea in pediatric tonsillitis with guideline of Preferred Reporting Items for Systematic review and Meta-Analysis (PRISMA). The

platform of literatures search was PubMed, ScienceDirect, and ClinicalTrials.gov. We used inclusion criteria of "(1) published articles investigating the different prevalence rate of sleep apnea in children (less than 18 years old) with tonsillitis and in control children without tonsillitis in part of comorbidity of sleep apnea and tonsillitis and published articles investigating the changes of sleep parameter before and after operation in children with tonsillitis in part of treatment effect of operation in sleep apnea in pediatric tonsillitis, and (2) articles that were conducted in human trials". In part of comorbidity of sleep apnea and tonsillitis, the primary outcome was set of prevalence rate of sleep apnea in children with tonsillitis, either determined by self-report or by apnea-hypopnea index (AHI) recorded by polysomnography. In part of treatment effect of operation in sleep apnea in pediatric tonsillitis, the primary outcome was determined by the changes of AHI before and after operation.

Result：In brief, total ten articles and one clinical trial were included in the current meta-analysis. Among them, four article were recruited in part of comorbidity of sleep apnea and tonsillitis (pediatric tonsillitis numbers= 274, mean age= 8.57; controlled children numbers= 594, mean age= 8.58; total mean female proportion= 47.29), and six articles in part of treatment effect of operation in sleep apnea in pediatric tonsillitis (pediatric tonsillitis numbers= 367, mean age= 6.91, mean female proportion= 39.46).

For part of different prevalence rate of sleep apnea in pediatric tonsillitis and controlled children without tonsillitis, the meta-analysis results revealed that there were significantly higher prevalence rates of sleep apnea in pediatric tonsillitis than

those in controls without tonsillitis (Odds ratio = 2.482, 95% CI =1.823 to 3.379, *P*< 0.001). For part of changes of AHI in pediatric tonsillitis before and after operation, the result of meta-analysis revealed significant improvement of AHI after operation in pediatric tonsillitis (Hedges' G = -1.752, 95% CI =-2.561 to -0.942, *P*< 0.001).

Conclusion：Our study provided evidences of higher comorbidity rates of sleep apnea and pediatric tonsillitis. In addition, the AHI would be significantly improved after adequate tonsillitis operation. This helps the evidence of the operation of tonsillitis in children with comorbid tonsillitis and sleep apnea.

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作　　者：楊為傑[*,1] 陳彥文[2] 曾秉濤[3] 王冠欽[4] 林博彥[5] 吳孟霓[6] 徐崇堯[6] 蘇茂昌[7]

服務單位：[1]大安婦幼醫院兒科 [2]元景耳鼻喉科神經科診所 [3]慈惠醫院精神科 [4]澄清醫院耳鼻喉科 [5]高雄長庚紀念醫院精神部 [6]高雄醫學大學附設中和紀念醫院 [7]高雄長庚紀念醫院胸腔部睡眠中心