The Effect of Functional Endoscopic Sinus Surgery on Obstructive Sleep Apnea Syndrome

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Abstract

Objectives: To study the influence of functional endoscopic sinus surgery (FESS) on sleep problems in patients with chronic rhinosinusitis surgery (CRS) is a very common sino-nasal disorder, with up to 13% of American adults affected (4). Sleep impairment has been reported to be a common problem in CRS patients (5). CRS patients often complain of nasal obstruction, which may play a role in sleep impairment. Moreover, it has been suggested that CRS is associated with the release of pro-inflammatory cytokines such as IL-1β and TNF-α which might be involved in the development of sleep problems (6). The impact of allergic rhinitis, CRS, and nasal polyposis on sleep has been evaluated by subjective and objective measures (5). CRS disease-specific questionnaires such as the Sino-Nasal Outcome Test-20 (SNOT-20), which includes sleep-specific survey items, have been used to evaluate sleep and its role in CRS (6). General sleep questionnaires such as the Epworth Sleepiness Scale (ESS) have not been widely used to evaluate sleep problems in CRS patients (6). Moreover, relatively few studies have used objective measures such as polysomnography (PSG) to evaluate sleep problems in CRS patients (7). It is believed that nasal surgeries that help to improve the nasal airway would benefit the sleep quality. However, whether isolated nasal surgery could improve OSAS is uncertain (8,9). The aims of this study were to investigate the benefit of functional endoscopic sinus surgery (FESS) for OSAS.

Methods and Materials

Methods: Patients with chronic rhinosinusitis who received FESS for treatment were included in this study. Before FESS they were asked about the severity of nasal obstruction and filled a Taiwanese version of the 20-item Sino-Nasal Outcome Test (SNOT-20) and the Epworth Sleepiness Scale (ESS) questionnaires. They received endoscopic examination, acoustic rhinometry, and polysomnography. According to the apnea-hypopnea index (AHI), they were divided into normal groups (AHI<15), mild obstructive sleep apnea syndrome (OSAS) group (5<AHI<15) and moderate-severe OSAS group (AHI≥15). Three months after operation, they were asked about the severity of nasal obstruction and filled a Taiwanese version of SNOT-20 and the ESS questionnaires again. They received another endoscopic examination, acoustic rhinometry, and polysomnography.

Results: There were 68 patients completing the study. Twenty-six belonged to normal group, 19 to mild OSAS group, and 23 to moderate-severe group. The nasal obstruction, SNOT-20 score and endoscopic score improve in all groups after surgery. However, AHI did not decrease in all groups.

Conclusion: Our results show that FESS might improve sleep problems in patients with mild OSAS but did not have effect on sleep problems in patients with moderate-severe OSAS.

Introduction

Sleep-disordered breathing is a spectrum of breathing abnormalities related to increased airway resistance. It includes snoring, upper airway resistance syndrome, and obstructive sleep apnea syndrome (OSAS). The nose has been shown to play an important role in the pathophysiology of sleep-disordered breathing (2). Allergic rhinitis was shown to be an independent risk factor for obstructive sleep apnea syndrome (OSAS). It is thought that nasal obstruction causes increased airway resistance resulting in the development of OSAS in these patients.

Chronic rhinosinusitis (CRS) is a very common sino-nasal disorder, with up to 13% of American adults affected (4). Sleep impairment has been reported to be a common problem in CRS patients (5). CRS patients often complain of nasal obstruction, which may play a role in sleep impairment. Moreover, it has been suggested that CRS is associated with the release of pro-inflammatory cytokines such as IL-1β and TNF-α which might be involved in the development of sleep problems (6). The impact of allergic rhinitis, CRS, and nasal polyposis on sleep has been evaluated by subjective and objective measures (5). CRS disease-specific questionnaires such as the Sino-Nasal Outcome Test-20 (SNOT-20), which includes sleep-specific survey items, have been used to evaluate sleep and its role in CRS (6). General sleep questionnaires such as the Epworth Sleepiness Scale (ESS) have not been widely used to evaluate sleep problems in CRS patients (6). Moreover, relatively few studies have used objective measures such as polysomnography (PSG) to evaluate sleep problems in CRS patients (7). It is believed that nasal surgeries that help to improve the nasal airway would benefit the sleep quality. However, whether isolated nasal surgery could improve OSAS is uncertain (8,9). The aims of this study were to investigate the benefit of functional endoscopic sinus surgery (FESS) for OSAS.

Methods: Patients with chronic rhinosinusitis who received FESS for treatment were included in this study. Before FESS they were asked about the severity of nasal obstruction and filled a Taiwanese version of the 20-item Sino-Nasal Outcome Test (SNOT-20) and the Epworth Sleepiness Scale (ESS) questionnaires. They received endoscopic examination, acoustic rhinometry, and polysomnography. According to the apnea-hypopnea index (AHI), they were divided into normal groups (AHI<15), mild obstructive sleep apnea syndrome (OSAS) group (5<AHI<15) and moderate-severe OSAS group (AHI≥15). Three months after operation, they were asked about the severity of nasal obstruction and filled a Taiwanese version of SNOT-20 and the ESS questionnaires again. They received another endoscopic examination, acoustic rhinometry, and polysomnography.

Results: There were 68 patients completing the study. Twenty-six belonged to normal group, 19 to mild OSAS group, and 23 to moderate-severe group. The nasal obstruction, SNOT-20 score and endoscopic score improve in all groups after surgery. However, AHI did not decrease in all groups.

Conclusion: Our results show that FESS might improve sleep problems in patients with mild OSAS but did not have effect on sleep problems in patients with moderate-severe OSAS.

Discussion

Two meta-analyses of nasal surgery for OSAS outcome reported that isolated nasal surgery improve snoring and sleep quality but not AHI (8, 9). Our results demonstrated similar findings. However, only two randomized controlled studies available for the impact of nasal surgery on OSAS outcome (10, 11). Previous studies enrolled patients who received various nasal surgeries including FESS, turbinate or septal surgeries. Whether FESS improves sleep quality and OSAS needs more investigation.

Conclusions

Our results show that FESS might improve sleep problems in patient with mild OSAS but did not have effect on sleep problems in patients with moderate-severe OSAS.

References

References

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