



Sex differences in the development of upper airway morphology: is this the new kid on the block?

Ayako Inoshita¹, Takatoshi Kasai^{2,3}, Rina Matsuoka¹, Naoko Sata¹, Nanako Shiroshita², Fusae Kawana², Mitsue Kato², Katsuhisa Ikeda¹

¹Department of Otorhinolaryngology, Head and Neck Surgery, Juntendo University School of Medicine, Tokyo, Japan; ²Cardiovascular Respiratory Sleep Medicine, Juntendo University Graduate School of Medicine, Tokyo, Japan; ³Department of Cardiovascular Medicine, Juntendo University School of Medicine, Tokyo, Japan

Correspondence to: Ayako Inoshita. Department of Otorhinolaryngology, Head and Neck Surgery, Juntendo University School of Medicine, 2-1-1 Hongo, Bunkyo-ku, Tokyo 113-8421, Japan. Email: ayaent@juntendo.ac.jp.

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We read the editorial entitled “When do gender differences begin in obstructive sleep apnea patients?” by Drs. Kim and Taranto-Montemurro (1). First of all, we would like to thank them for their thoughtful comments on our published article (2). As Drs. Kim and Taranto-Montemurro pointed out, in our study, there are limitations including small sample size, limited information of airway area estimation, and lack of sex hormones data. In terms of spontaneous remission of adenoid tissues, we also are not aware of data directly indicating that girls are more likely to have spontaneous remission of adenoid tissues than boys. Many cephalometric studies evaluated the craniofacial features related to obstructive sleep apnea (OSA) as predisposing factors in the pathogenesis of upper airway obstruction and few studies investigated the correlation between OSA severity and the cephalometric variables in children (3,4). Moreover, in a recent cross-sectional study in which lateral cephalograms of 230 subjects were analyzed, it was suggested that puberty growth peak of the maxilla and mandible occurred on average four months earlier in girls than in boys (5). Thus, we concluded that girls may have spontaneous remission of adenotonsillar tissues by lateral neck radiograph without craniofacial skeletal morphology. Nevertheless, we agree that it is important to know about sex differences in the upper airway in terms of both the soft tissue and the craniofacial skeletal morphology determined not only by cephalometry, but also computed tomography (CT) or magnetic resonance imaging (MRI). Indeed,

longitudinal studies based on lateral cephalograms have identified wide individual variations in the time of pubertal growth spurt onset and duration (6). Therefore, as Drs. Kim and Taranto-Montemurro also suggested, it would be important to follow upper airway morphology changes longitudinally using not only cephalograms but also CT and/or MRI.

In conclusion, there are several limitations to support our new hypothesis that adolescent girls with OSA had greater upper airway space in addition to less severe OSA and better sleep efficiency compared to adolescent boys. We would like to confirm further several issues. We greatly appreciate Drs. Kim and Taranto-Montemurro for the kind comments.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

1. Kim SW, Taranto-Montemurro L. When do gender differences begin in obstructive sleep apnea patients? *J Thorac Dis* 2019;11:S1147-9.
2. Inoshita A, Kasai T, Matsuoka R, et al. Age-stratified sex differences in polysomnographic findings and pharyngeal morphology among children with obstructive sleep apnea. *J Thorac Dis* 2018;10:6702-10.
3. Gulleminault C, Stoohs R. Chronic snoring and obstructive sleep apnea syndrome in children. *Lung* 1990;168 Suppl:912-9.
4. Galeotti A, Festa P, Viarani V, et al. Correlation between cephalometric variables and obstructive sleep apnoea severity in children. *Eur J Paediatr Dent* 2019;20:43-7.
5. Jeelani W, Fida M, Shaikh A. The duration of pubertal growth peak among three skeletal classes. *Dental Press J Orthod* 2016;21:67-74.
6. Fishman LS. Chronological versus skeletal age, an evaluation of craniofacial growth. *Angle Orthod* 1979;49:181-9.

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