

The Positive Effect of Adenotonsillectomy on Drooling in Children

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Disclosure

- Nothing to disclose



Introduction

Drooling is the unintentional loss of saliva from the mouth

- significant social burden
- frequent bib /clothing changes
- cracked painful lips/skin

Adenotonsillectomy is a common procedure in children, the main indication is upper airway obstruction (UAO)



Objectives

- Are children with upper airway obstruction prone to drooling ?
- The effect of adenotonsillectomy on drooling in children



Methods

- Prospective questionnaire-based study
- Healthy matched control group

Inclusion criteria:

- Patients with UAO planned for Adenotonsillectomy (AT) or Adenoidectomy (ADE)
- Age 18 months - 4 years

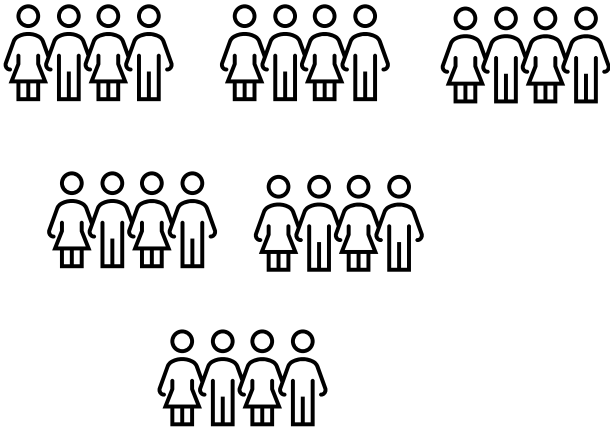
Exclusion criteria:

- Developmental delay/cerebral palsy/neuromuscular disease
- Medication known to cause hypersalivation (anticonvulsants, antipsychotic)
- Previous upper airway surgery

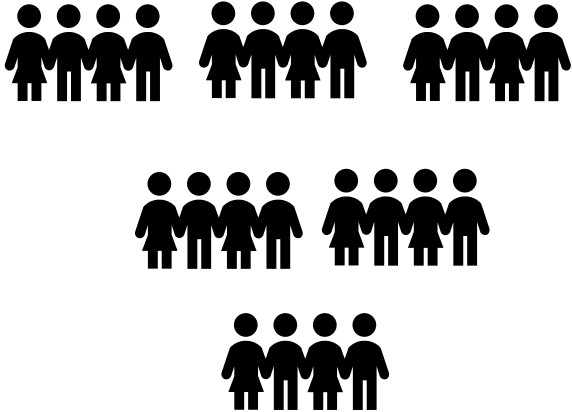


Methods

50 Healthy Control



50 ADE/AT



2 months postOp



Drooling Infants and Preschoolers Scale – DRIPS

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Full length article

Development of the Drooling Infants and Preschoolers Scale (DRIPS) and reference charts for monitoring saliva control in children aged 0–4 years

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Factor 1, Activities

question	frequency	severity	total
8. Does drooling occur in your child when in prone position			
9. Does drooling occur in your child while seated and supported			
10. Does drooling occur in your child while actively moving around			
11. Does drooling occur in your child while using fine-motor materials			
16. Does drooling occur in your child when babbling/talking			
Total score/P value			/P

Factor 2, Feeding

question	frequency	severity	total
12. Does drooling occur in your child while eating and drinking			
Total score/P value			/P

Factor 3, Sucking on thumb or dummy

question	frequency	severity	total
13. Does drooling occur in your child while sucking a dummy or its thumb in the <u>day time</u>			
14. Does drooling occur in your child while sucking a dummy or its thumb in the <u>night time</u>			
Total score/P value			/P

Factor 4, Sleep

question	frequency	level	total
15. Does drooling occur in your child while sleeping			
Total score/P value			/P

Thomas-Stonell and Greenberg Saliva Severity scale (TSG-s)

Drooling	Score
<i>Severity</i>	
1. Dry (never drools)	1
2. Mild (wet lips only)	2
3. Moderate (wet lips and chin)	3
4. Severe (wet clothes)	4
5. Profuse (wet clothing, hands, trays, objects within reach)	5
<i>Frequency</i>	
6. Never drools	1
7. Occasionally drools	2
8. Frequently drools	3
9. Constantly drools	4



Results

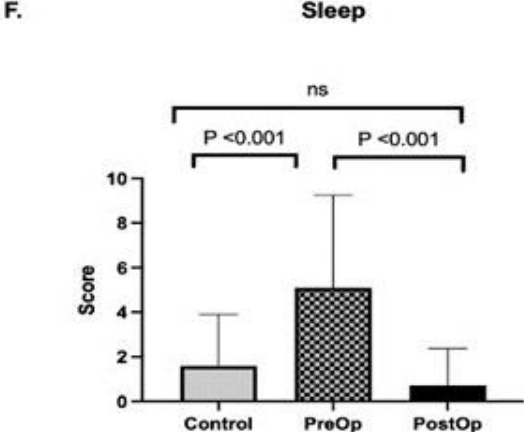
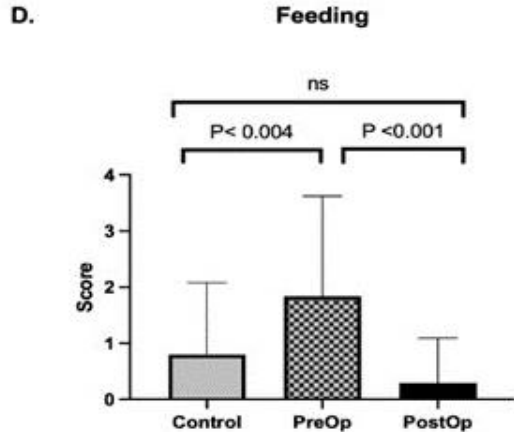
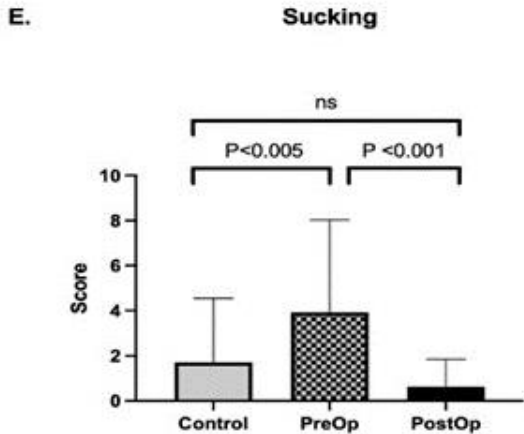
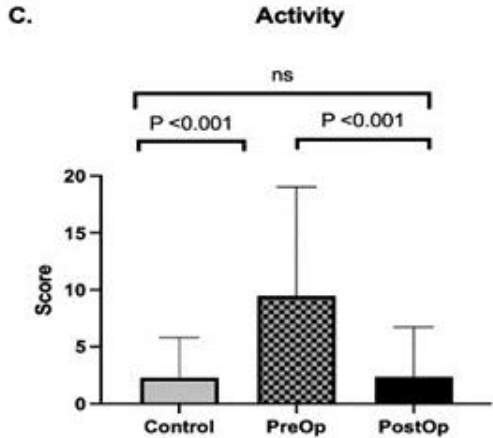
- N=43 N control= 44
- Age 31(± 8 SD) months
- Tonsil size 2.8 (± 0.7 SD)
- Adenoid size 2.9 (± 0.8 SD)

	N=43
Male	29
Female	14
AT	40
ADE	3



Results

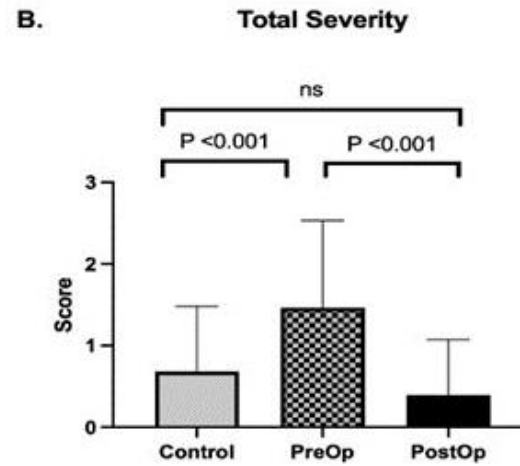
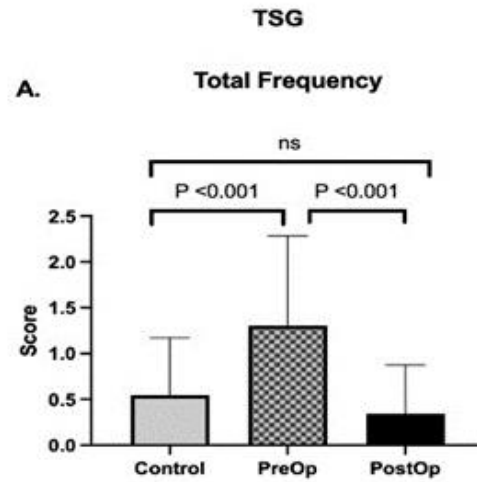
DRIPS



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Results



Discussion

- Mouth breathing and swallowing problems are likely to be the cause of increased drooling in children with UAO and adenotonsillar hypertrophy
- The Nordic Orofacial Test-Screening 2009, N = 67 - Children with adenotonsillar hypertrophy in almost all cases have other oral motor problems in addition to breathing obstruction

JAMA Otolaryngology-Head & Neck Surgery | [Original Investigation](#)

Dysphagia Outcomes Before and After Adenotonsillectomy in Children With Obstructive Sleep Apnea A Secondary Analysis of a Randomized Clinical Trial

Chao Wang, MD; Huiying Hu, MD; Kai Sun, MD; Yulong Ma, MD; Yuanyuan Lu, MD; Kai Liu, MD, PhD;
Zhenkun Yu, MD, PhD



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Limitation

- Questionnaire – subjective
- Subjective information regarding the severity of UAO and sleep disordered breathing for both the study and control groups



Conclusion

- Drooling negatively affects both children and parents regarding physical well-being
- Parents report increased drooling severity and frequency in pediatric patients requiring adenotonsillectomy compared to controls
- Drooling severity and frequency significantly improved post-operative in different aspects during the day and night compared to their pre operative state



Conclusion

- Increased awareness of pediatricians and otolaryngologists of the association between UAO and drooling is important
- Drooling should be addressed at the pre and post operative exam



References

1. Van Hulst, K. et al. Development of the Drooling Infants and Preschoolers Scale (DRIPS) and reference charts for monitoring saliva control in children aged 0-4 years. *Infant Behav Dev* 50, 247–256 (2018).
2. Arrarte J, Lubianca Neto JF, Fischer GB. The effect of adenotonsillectomy on oxygen saturation in children with sleep breathing disorders. *Int J Pediatr Otorhinolaryngol*. 2007 Jun;71(6):973-8. doi: 10.1016/j.ijporl.2007.03.011. Epub 2007 Apr 24. PMID: 17459490.
3. Lundeberg I, McAllister A, Graf J, Ericsson E, Hultcrantz E. Oral motor dysfunction in children with adenotonsillar hypertrophy--effects of surgery. *Logoped Phoniatr Vocol*. 2009;34(3):111-6. doi: 10.1080/14015430903066937. PMID: 19565403.
4. Nunn JH. Drooling: review of the literature and proposals for management. *J Oral Rehabil*. 2000 Sep;27(9):735-43. doi: 10.1046/j.1365-2842.2000.00575.x. PMID: 11012847.
5. Rashnoo, P. & Daniel, S. J. Drooling quantification: Correlation of different techniques. *Int. J. Pediatr. Otorhinolaryngol*. 79, 1201–1205 (2015).
6. Fairhurst, C. B. R. & Cockerill, H. Management of drooling in children. *Arch Dis Child Educ Pract Ed* 96, 25–30 (2011).
7. Daniel, S. J. Multidisciplinary management of sialorrhoea in children. *Laryngoscope* 122 Suppl 4, S67-68 (2012).
8. Montgomery, J. et al. Managing children with sialorrhoea (drooling): Experience from the first 301 children in our saliva control clinic. *Int. J. Pediatr. Otorhinolaryngol*. 85, 33–39 (2016).
9. Hockstein, N. G., Samadi, D. S., Gendron, K. & Handler, S. D. Sialorrhoea: a management challenge. *Am Fam Physician* 69, 2628–2634 (2004).
10. Harris, S. R. & Purdy, A. H. Drooling and its management in cerebral palsy. *Dev Med Child Neurol* 29, 807–811 (1987).
11. Reid, S. M., Johnson, H. M. & Reddihough, D. S. The Drooling Impact Scale: a measure of the impact of drooling in children with developmental disabilities. *Dev Med Child Neurol* 52, e23-28 (2010).
12. Martin, T. J. & Conley, S. F. Long-term efficacy of intra-oral surgery for sialorrhoea. *Otolaryngol Head Neck Surg* 137, 54–58 (2007).
13. Chang, C. J. & May-Kuen Wong aA, null. Intraductal laser photocoagulation of the bilateral parotid ducts for reduction of drooling in patients with cerebral palsy. *Plast. Reconstr. Surg*. 107, 907–913 (2001).
14. Lawrence, R. & Bateman, N. Surgical Management of the Drooling Child. *Curr Otorhinolaryngol Rep* 6, 99–106 (2018).
15. Wang C, Hu H, Sun K, et al. Dysphagia Outcomes Before and After Adenotonsillectomy in Children With Obstructive Sleep Apnea: A Secondary Analysis of a Randomized Clinical Trial. *JAMA Otolaryngol Head Neck Surg*. Published online August 17, 2023. doi:10.1001/jamaoto.2023.2145



Thank you

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