

**Online Table S9.2:** Special population: obese children

Author	Country	Journal	Study design	Number of patients	Ages	BMI	Evaluation	Conclusion
Shine et al. [1]	Australia	Arch Otolaryngol Head Neck Surgery	Retrospective cohort	19 obese (BMI >95 <sup>th</sup> centile) children	2 - 18 yrs	Median BMI z-score (SD): 2.84 (0.94)	10 children needed CPAP after AT	AT improves sleep respiratory parameters in morbidly obese children with OSA but most patients have residual OSA requiring further treatment.
Beebe et al. [2]	USA	Plos One	Prospective study	13 obese patients treated with CPAP + 15 obese controls without OSA	14.8 ± 1.8 yrs	42.4 ± 6.1	Neurobehavioral evaluation (parent and self report questionnaire), academic grades and attention test done at baseline and > 4 m after CPAP initiation Adherence defined by a use > 21% of sleep time: 6 were adherent, 7 not	Improved attention and academic performance in the adherent patients Limitations: data not presented separately for those with obesity, no comparison of obese vs non-obese subjects.
Puri et al. [3]	USA	J Clin Sleep Med	Retrospective study	37 obese children treated with CPAP	1.6 – 18 yrs	BMI z-score 1.8±1.4 [full group], 65% obese	Overall group: mean use was 3.4 ± 2.7 h/night at 1 week, 2.8 ± 2.3 h/night at 1 m, 2.7 ± 2.4 h/night at 3 m Greater adherence when younger age, higher maternal education, household member using CPAP, and greater use at 1 week	Overall CPAP adherence was low Having a family member with OSA on CPAP therapy was associated with better adherence in the child. The cohort has a number of comorbidities (asthma, neurological condition, craniofacial conditions) that can affect CPAP adherence, and that is not specific for obese population. Limitation: data not presented or

								analyzed separately for subjects with obesity.
Katz et al. [4]	Canada	J Clin Sleep Med	Prospective multicenter	27	6-18 yrs	BMI z-score: mean 2.6 (2.3-2.8)	Evaluation of insuline resistance, 24h-BP, h-CRP at baseline and 6 and 12 m 14 CPAP, 13 BPAP 14 adherent (> 6h use/night)	CPAP/BPAP no effect on insulin resistance, 24h-BP, hs-CRP at 6 and 12 m However there were[3] clinically relevant improvements in insulin resistance and systolic BP load.
Alonso-Alvarez et al. [5]	Spain	Sleep Med	Cross sectional prospective multicenter	113 but only 6 treated with CPAP	11.3 ± 2.9 yrs	BMI z-scores: 1.34 ± 0.59	Only 6/113 children treated with CPAP for 1 yr	Significant univariate associations between BMI and CRP, insulin, and homeostasis model assessment of insulin resistance present at baseline and after 1 yr after CPAP initiation. With CPAP (n=6): decrease in glucose, CRP, cholesterol, LDL/HDL No information on compliance
Sudaram et al. [6]	USA	J Pediatrics	Prospective	9	11.5 ± 1.2 yrs	BMI z-score 2.2 ± 0.3	CPAP duration 89 ± 62 days Adherence 73 ± 24% of nights Mean use 296 ± 126 min/night	Improvement of biomarkers of non-alcoholic fatty liver disease, liver enzymes, oxidative stress and metabolic syndrome Of note: low baseline AHI : mean 7, max 11/h
Amini et al. [7]	USA	Children	Retrospective, single centre	18 (BMI≥85 %, AHI >1, treated with CPAP/BPAP)	11.8±3.4 y (full group)	BMI z-score 2.6±0.5	17 CPAP, 1 BPAP; 2 CPAP + 1 BPAP titrated in the lab, remainder (14) treated with auto-CPAP. Mean follow-up 19 m (median 12.5 m, range 3-46 m)	Decrease in total cholesterol, LDL cholesterol in CPAP/BPAP group No change in HDL cholesterol, triglycerides, fasting glucose, or BMI in either subgroup.
Baldi et al. [8]	India	Indian J Pediatr	Simulation cohort,	Not applicable	1-18 yrs	Not applicabl	Simulation of adverse outcomes of obesity in	Costs for adverse outcomes related to OSA (stroke, CHD, type 2 DM in

			based on 2011 Indian census			e	OSA children	adulthood) in patients only treated with AT are higher compared to those treated with both AT and CPAP; even if CPAP results are more expensive than AT, the two treatment together promote a greater reduction of obese subjects and a subsequent higher reduction in adverse outcomes resulting in an overall cost reduction compared to AT alone.
Carriere et al. [9]	France	Acta Paediatr	Retrospective cohort, single centre, received care for obesity	128 children referred for overweight or obesity, 10 on CPAP	12.1 ± 3.2 yrs		Healthcare management offered; diagnostic and therapeutic impact of sleep consultation Time to set-up CPAP 1-9 m after consultation	PSG identified OSA in 24.2% of overall population. CPAP suggested for 17, prescribed for 10 and finally used by 8 (6.2% of the study population, 10% of those undergoing PSG).

Abbreviations: m: months, yrs: years, CPAP: continuous positive airway pressure, BPAP: bilevel positive airway pressure, NIV: noninvasive ventilation, OSA: obstructive sleep apnea, BMI: body mass index, AT: adenotonsillectomy, PSG: polysomnography, AHI: apnea-hypopnea index, DM: diabetes mellitus, BP: blood pressure, hs-CRP: high sensitivity C-Reactive Protein, LDL: low density lipoprotein, HDL: high density lipoprotein.

## References

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