



# Comparison of cardiac function and valvular damage in children with and without adenotonsillar hypertrophy

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## KEYWORDS

Adenotonsillar hypertrophy;  
Child;  
Valvular damage;  
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## Summary

**Objective:** Comparison of cardiac function in children with and without adenotonsillar hypertrophy.

**Methods:** We examined 28 pediatric patients with adenotonsillar hypertrophy mean aged  $7.3 \pm 2.9$  years comprised of 14 females and 14 males (group I). The control group were chosen from 35 healthy sex and age matched children mean aged  $7.37 \pm 2.7$  years (group II). Both groups were examined by an otorhinolaryngologist and adenotonsillar hypertrophy was diagnosed with nasal endoscopic method or lateral neck X-ray. All the patients in group I underwent adenotonsillectomy. Cardiology and echocardiographic examinations were performed in both groups. Echocardiographic examination was done twice in group I (preoperative and postoperative first month) however in group II only once. Preoperative findings of group I compared with the findings of group II. Preoperative and postoperative echocardiographic findings were also compared within group I. The chi-square test and the independent paired-sample *t*-test were used for statistical analysis.

**Results:** The tricuspid end-diastolic time was the only significant difference in echocardiographic findings between the two groups ( $104.8 \pm 28.8$  ms versus for  $86.4 \pm 17.32$  ms  $p < 0.05$ ). There was no statistical difference between preoperative and postoperative echocardiographic findings in group I. Brady-tachyarrhythmia was

**Abbreviations:** ATH, adenotonsillar hypertrophy; OSAS, obstructive sleep apnea syndrome; IVSS, interventricular septum end-systolic diameter; IVSD, interventricular septum end-diastolic diameter; LVES, left ventricular end-systolic diameter; LVED, left ventricular end-diastolic diameter; LVPWD, left ventricular posterior wall end-diastolic diameter; LVPWS, left ventricular posterior wall end-systolic diameter; EF, ejection fraction; FS, fractional shortening; FDT, full diastolic filling time; PH, pulmonary hypertension; RF, rheumatic fever

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detected on electrocardiography – performed with 24 h ambulatory electrocardiography – in one patient. To our surprise, in group I five patients had cardiac valve damage: mitral and/or aortic valve insufficiency. These findings were interpreted as silent carditis.

**Conclusion:** There was no significant difference in right ventricular function between the children with and without adenotonsillar hypertrophy. Whereas, there was shortening of tricuspid end-diastolic time in group I. However, five patients having adenotonsillar hypertrophy developed a cardiac dysfunction which was not observed in the control group. Therefore, we assumed a correlation between adenotonsillar hypertrophy and possible silent carditis following frequent tonsillitis.

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## 1. Introduction

Adenotonsillar hypertrophy (ATH) is the most common cause of upper airway obstruction and obstructive sleep symptoms in children [1]. Mechanical airway obstruction due to ATH may lead to cardiopulmonary complications associated with hypercarbia and hypoxemia [2,3]. In the most severe form, ATH can lead to right heart failure, cor pulmonale, developmental delay, failure to thrive, or even to death [1–7]. Gorur et al. report that there were marked improvements in right ventricular diameter, LVED and IVSS following the surgery in children with ATH [6].

In this study, we aimed to compare both the cardiac functions in children with and without ATH and the cardiac functions in preoperative and postoperative periods in children with ATH.

## 2. Methods

In this study we examined 63 children divided into two groups. Group I ( $n = 28$ ) consist of 14 female and 14 male patients who were admitted to Fatih University Otorhinolaryngology outpatient clinic with complaints of snoring, mouth breathing and transient cessation of breathing during sleep. The mean age was  $7.3 \pm 2.9$  (range, 3–14) years. The control group (group II,  $n = 35$ ) was selected from age and sex matched children who were admitted to Fatih University Social-Pediatrics outpatient clinic. The mean age was  $7.37 \pm 2.7$  (range, 3–13) years. The characteristics of the patients are shown in Table 1.

All the patients in group I underwent complete otorhinolaryngologic examination. Adenotonsillar hypertrophy was diagnosed by nasopharyngeal endoscopy. However, lateral neck X-ray was used

**Table 1** Characteristics of the patients in the two study groups (ATH: adenotonsillar hypertrophy)

	Group I (ATH)	%	Group II	%
<b>Demographic features</b>				
<i>n</i> -value	28		35	
Mean age (years)	$7.3 \pm 2.9$		$7.37 \pm 2.7$	
Females	14	50	15	42.8
Males	14	50	20	57.2
<b>Tonsil size</b>				
Grade IV	9	32.1	–	
Grade III	16	57.2	–	
Grade II	3	10.7	–	
Grade I	–		35	100
<b>Adenoid size</b>				
+3	18	64.2	–	
+2	10	35.8	–	
<b>Severity of cardiac murmur</b>				
1/6	5	18	10	28
2/6	4	14	4	11
Snoring	28	100	–	
Recurrent tonsillitis >6 episodes/year	16	57	6	17

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