



# Echocardiographic Diagnosis of Acute Rheumatic Silent Carditis in Children and Comparison of the Features of Patients with Clinical and Silent Carditis



Semra Atalay, Esra Pekpak, Cem Karadeniz, Fikri Demir, Ercan Tutar  
Ankara University School of Medicine, Department of Pediatric Cardiology, Ankara, Turkey

## Introduction:

Rheumatic fever (RF) is an inflammatory disease caused by autoimmune response to a preceding Group A streptococcal infection. It is leading cause of acquired heart disease in children and young adults worldwide and carditis is the most important manifestation of RF that may result significant morbidity and mortality. Colour Doppler echocardiography is now widely used for early detection of cardiac involvement even in the absence of clinical evidence that called subclinic or silent carditis (SC). This entity is cause similar consequences to clinically evident carditis (CC).

We aimed to determine the frequency of SC and to compare clinical and echocardiographic features of patients with silent and clinically evident carditis.

## Methods:

156 consecutive patients, diagnosed with acute rheumatic fever in our pediatric cardiology department between 2003-2009 were included into study. All the patients underwent echocardiographic evaluation. Clinical and echocardiographic features of the patients were recorded. Follow up data was also obtained. The patients without clinical evidence but with echocardiographic findings of carditis were diagnosed as SC. The features of those patients were compared with CC group.

## Results:

Acute rheumatic fever was diagnosed in 156 patients and 103 (66%) of them had carditis. The ratio of SC was 28.2% among these 103 patients. Among patients with chorea, 17 (89.5%) had evidence of carditis. The chorea was more frequently observed major criteria in the patients with SC (31%). Whereas, arthritis was more common in CC group (Table 2). Isolated mitral regurgitation was the most common lesion and concomitant involvement of mitral and aortic valves was the next common finding in both groups (Table 3). Seventy-four of the patients with carditis were followed up more than one year and 20 of those had SC. Valvular regurgitation disappeared completely in 14.8% and improved in 37% of the patients with CC. The recovery and improvement rates in SC group were 15% and 30%, respectively. No significant difference was determined for persistent valvular damage between the groups (Table 4).

Features	Value	
Age (mean $\pm$ SD, years)	10.8 $\pm$ 2.6	
Gender (female%/male%)	49.4 / 50.6	
Jones major clinical findings (number (%))	Carditis	103 (66)
	Arthritis	60 (38.5)
	Chorea	19 (12.1)
	Erythema marginatum	4 (2.6)
	Subcutaneous nodules	2 (1.3)
	Carditis + arthritis	33 (21.2)
	Carditis + chorea	17 (10.9)

Table 1. The characteristics of 156 patients with rheumatic fever

	CC (n:74)	SC (n:29)	P
Age (mean $\pm$ SD)	11.16 $\pm$ 2.46 yr	11.14 $\pm$ 2.40 yr	NS
Gender (female%/male%)	51.4 / 48.6	44.8 / 55.2	NS
Arthralgia*	29 (39.2)	11 (37.9)	NS
Any murmur*	74 (100) <sup>a</sup>	6 (20.7) <sup>b</sup>	-
Fever*	14 (18.9)	2 (6.9)	NS
Any Arthritis*	27 (36.5)	6 (20.7)	0.04
Monoarthritis*	10 (13.3)	4 (14.3)	NS
Chorea*	8 (10.8)	9 (31)	0.019

Table 2. The features of the patients with carditis (\*: shown as number (%), <sup>a</sup>: partly innocent, <sup>b</sup>: entirely innocent, NS: not significant)

Valvular involvement*	CC (n:74)	SC (n:29)	P value
Isolated MR	49 (66.2)	19 (65.5)	NS
Isolated AR	4 (5.4)	1 (3.4)	NS
MR + AR	21 (28.4)	7 (24.2)	NS

Table 3. The frequency of valvular involvement (\*: shown as number (%))

	CC (n:54)	SC (n:20)	P value
Follow up period (months)	33.2 $\pm$ 16.7 <sup>a</sup>	29.8 $\pm$ 17.7 <sup>a</sup>	NS
Signs of inflammation at referral	39 (72.2)	7 (35)	0.003
Disappearance of valvular regurgitation	8 (14.8)	3 (15)	NS
Disappearance duration (months)	9 (3-36) <sup>b</sup>	12 (4-22) <sup>b</sup>	NS
Improvement of valvular regurgitation	20 (37)	6 (30)	NS
Deterioration of valvular regurgitation	3 (5.6)	0 (0)	NS
Unchanged valvular status	23 (42.6)	11 (55)	NS
Compliance with penicillin prophylaxis	48 (88.9)	18 (90)	NS
Rebound or recurrence	7 (13)	2 (10)	NS

Table 4. The characteristics of followed up patients <sup>a</sup>: shown as mean  $\pm$  SD, <sup>b</sup>: shown as median and ranges, the remainder were shown as number (%)

## Conclusion:

As Jones criteria (JC) themselves may be insufficient to diagnose SC and clinical course of SC is not different from CC, echocardiography should be included into JC as a major finding. In order to establish this, we need more studies with longer follow-up duration that will completely reveal clinical and particularly prognostic features of SC. In addition, secondary prophylaxis with penicillin is important for reduce recurrence and deterioration risk of silent carditis.