

Diagnosis of peripartum cardiomyopathy (PPCM)

Aims

Diagnosis of peripartum cardiomyopathy (PPCM) is often made late or missed. Despite the ECG being a simple, widely available screening tool for heart disease, the nature, frequency and evolution of ECG-abnormalities in PPCM remains poorly defined. This study assessed the prevalence of ECG abnormalities in newly diagnosed PPCM patients.

Methods

12-Lead ECGs were performed on 78 consecutive patients presenting with PPCM to two tertiary centres in South Africa on diagnosis and six-month follow-up.

Results

Almost all patients included were black African women, of mean age 29 ± 7 years. On first diagnosis, most ECGs were in sinus rhythm (92%), with mean baseline heart rate of 100 beats-per-minute. Abnormalities included the following: [1]abnormal frontal-plane QRS axis (25%), with left axis deviation (11%), right axis deviation (10%) and indeterminate axis (4%); [2]Bundle-branch block (11%), [3]Atrial abnormality (29%), 10% and 14% being left- and right-atrial, respectively; [4]T-wave changes (59%).

At six-month follow-up, heart rate had slowed significantly ($p < 0.001$), and abnormalities observed in the following: [1]QRS-axis (12%); [2]Bundle-branch block similar to baseline; [3]Atrial abnormalities (9%), only 2% and 7% showing left- and right-atrial abnormalities, respectively. The prevalence of left ventricular hypertrophy was similar between visits; while T-wave abnormalities decreased to 40% at six months.

Table 1. Minnesota Code Major and Minor ECG Criteria

Major ECG Criteria	Minor ECG Criteria
Q-wave abnormalities	Borderline Q-waves
ST-segment depression	Left or right axis deviation
T-wave inversion	High amplitude R-waves
2° or 3° AV-block	Borderline ST-depression
Complete LBBB or RBBB	T-wave flattening
	Low QRS voltage

*LBBB Left Bundle Branch Block; RBBB Right Bundle Branch Block

[Adapted from Lee et al, 2006]

Table 2. Demographic Profile of the 78 Patients with Peripartum Cardiomyopathy

	Mean/Median*
Age (years)	29 ± 7
Parity	2 (IQR 1-3)
Postpartum Period at Presentation (days)	16 (IQR 3-28)
BMI (kg/m ²)	24.3 (IQR 22.7 - 27.5)
Pulse Rate	99 ± 19
Blood Pressure	
• Mean systolic	116 ± 20 mmHg
• Mean diastolic	76 ± 14 mmHg

*Standard Deviation (\pm SD); Inter-quartile Range (IQR)

Table 3. Baseline ECG Characteristics in 78 Patients with Peripartum Cardiomyopathy

	Baseline n=78 (% of Population)	6 Months Follow-up n=44 (% of Population)	p-value
Mean Heart Rate (bpm)	100 ± 21	76 ± 14	<0.01
Sinus Rhythm	92 (95% CI 81-95)	66 (95% CI 50-80)	0.04
Sinus Tachycardia	45 (95% CI 34-57)	7 (95% CI 1-19)	
Arrhythmias			1.0
• PVC	4		
• SVR	1		
• Other	5		
QRS Axis			0.12
• Abnormal	2 (95% CI 16-38)	14 (95% CI 5-27)	
• Left Axis	12 (95% CI 5-21)	7 (95% CI 1-19)	
• Right Axis	10 (95% CI 5-19)	5 (95% CI 0.5-16)	
• Indeterminate	4 (95% CI 0.8-11)	2 (95% CI 0.05-12)	
Bundle Branch Block (BBB)			
• Left BBB	12 (95% CI 5-21)	18 (95% CI 8-33)	
• Right BBB	5 (95% CI 1-13)	9 (95% CI 3-22)	
• Right BBB	1 (95% CI 0.03-7)	2 (95% CI 0.05-12)	
T-wave abnormalities			
• Major	59 (95% CI 47-70)	41 (95% CI 26-57)	
• Minor	38 (95% CI 28-50)	34 (95% CI 26-42)	
• Minor	31 (95% CI 21-42)	9 (95% CI 3-22)	
ST-segment changes			
• Major ST changes	38 (95% CI 28-50)		
• Minor ST changes	31 (95% CI 21-42)		
• ST segment elevation	1 (95% CI 0.03-7)		
Left ventricular hypertrophy	9 (95% CI 4-18)		
Atrial abnormalities			0.009
• Left atrium	29 (95% CI 20-41)		
• Right atrium	10 (95% CI 5-19)		
• Bi-atrial	14 (95% CI 7-24)		
• Bi-atrial	5 (95% CI 1-13)		
Echocardiography			
• IVS (cm)	0.9 (IQR 0.8-1.1)		
• LVEDD (cm)	5.8 ± 0.7		
• EF (%)	30.5 ± 9		

Conclusions

This is the first known systematic analysis of serial ECG data on PPCM in South Africa. Most newly diagnosed PPCM patients were in sinus tachycardia, almost two-thirds having T-wave abnormalities, and a third with atrial abnormalities. These three parameters improved at six months. The ECG in PPCM appears abnormal in 100% of patients and may serve as a screening tool for women presenting with non-specific peripartum symptoms of heart failure.