

Impact of telemedicine in the diagnosis and management of cardiac arrhythmias in children

Huma Waqar^{1*}, Zareen Qasmi¹, Aisha Siddiqua¹

1. Child life foundation Karachi, Pakistan

Correspondence to: Huma Waqar

*Child life Foundation, Karachi, Pakistan.

Email: huma.waqar124@gmail.com

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Background: Telemedicine enables remote diagnosis and treatment using telecommunications technology and may support emergency physicians managing critically ill children, particularly where specialist services are limited. Remote electrocardiogram monitoring can facilitate early recognition and management of abnormal cardiac rhythms.

Objective: To evaluate the impact of telemedicine in the diagnosis and management of cardiac arrhythmias in children aged 0-13 years in pediatric emergency.

Methods: This retrospective review included complete EMRs of pediatric patients with cardiac diseases managed after telemedicine consultation from November 2023 to May 2025. Patients tele-assisted for abnormal cardiac rhythms through Child Life Foundation “telemedicine unit 1” from December 2024 to May 2025 were reviewed. Telemedicine physicians remotely monitored clinical condition and electrocardiograms using high-resolution cameras, Voice over Internet Phone, videoconferencing, and Microsoft Teams, with cardiology consultation from the National Institute of Cardiovascular Disease.

Results: During the 18-month period (November 2023 to May 2025), 255 patients received teleconsultation for suspected cardiac diseases. Arrhythmias accounted for 69 (27%) consultations. Diagnoses included supraventricular tachycardia 17 (24.6%), heart block 11 (15.9%), sinus tachycardia 9 (13%), sinus bradycardia 7 (10%), ventricular tachycardia 1 (1.44%), tall T waves 2 (2.8%), and ST elevation 1 (1.4%). No specific ECG changes were identified in 21 (30%) patients. Of the 69 patients, 55 (79%) were managed and reassessed in pediatric emergency, 2 (2.8%) were admitted, 11 (15.9%) were referred, and 1 (1.4%) expired.

Conclusion: Telemedicine enabled timely specialist-supported diagnosis, management, and outcomes of pediatric arrhythmias overall, with potential reductions in mortality (1.4%) and referral (15.9%); larger studies are needed to confirm these findings.

Keywords: Telemedicine, pediatric emergency, cardiac arrhythmias, supraventricular tachycardia, electrocardiogram, pediatric cardiology, remote consultation, emergency medicine.