

# A rare case of acute rheumatic fever with three different types of atrioventricular blocks in the same patient

 Kahraman Yakut,<sup>1</sup>  Busra Eybek,<sup>2</sup>  Elif Erolu,<sup>3</sup>  Mehmet Karacan<sup>4</sup>

<sup>1</sup>Department of Pediatric Cardiology, Bezmialem Vakif University Faculty of Medicine, Istanbul, Turkey

<sup>2</sup>Department of Pediatrics, Umraniye Training and Research Hospital, Istanbul, Turkey

<sup>3</sup>Department of Pediatric Cardiology, Umraniye Training and Research Hospital, Istanbul, Turkey

<sup>4</sup>Department of Pediatric Cardiology, University of Health Sciences, Umraniye Training and Research Hospital, Istanbul, Turkey

## ABSTRACT

Acute rheumatic fever (ARF) is a systemic autoimmune disease that results from abnormal immune response to group A streptococcus (GAS) pharyngitis. Although first degree atrioventricular (AV) block is the most common rhythm problem associated with the disease other conduction abnormalities also could be seen. We reported three different types of conduction defects (First-degree AV block, second-degree AV block and complete AV block) in a 15 years old case diagnosed with ARF. 15 years old male patient presented with palpitation. Physical exam findings were unremarkable except dysrhythmic heart sounds. Acute phase reactants were positive, and electrocardiogram showed second degree type I AV block at hospital admission. In the second day of admission right first metatarsophalangeal arthritis as well as arthralgia involved both knees and ankles developed. Echocardiography revealed moderate rheumatic mitral regurgitation. First degree AV block with brief complete AV block episode was seen on 24 hours rhythm Holter recordings. Based on clinical and laboratory findings acute rheumatic fever diagnosis was made and anti-inflammatory therapy (naproxen sodium) with benzathine penicillin G was started to the patient. First degree AV block lasted 3 weeks and other conduction disorders were not seen again First, second and complete AV block could be seen during acute rheumatic fever episode and acute rheumatic fever should be considered as a one of causes of arrhythmias.

*Keywords: Acute rheumatic fever; atrioventricular block; arthritis.*

**Cite this article as:** Yakut K, Eybek B, Erolu E, Karacan M. A rare case of acute rheumatic fever with three different types of atrioventricular blocks in the same patient. *North Clin Istanbul*

Acute rheumatic fever is still one of the most common causes of acquired cardiac morbidity and mortality worldwide. Major and minor Jones criteria are used to diagnose the disease [1]. It is well known that acute rheumatic fever affects heart conduction system and frequently causes first degree AV block which is one of Jones minor criteria. Higher degree AV block, supra-

ventricular tachycardia, atrial/ventricular ectopic beats, bundle branch block and accelerated nodal rhythm are other rarely reported rhythm disturbances. Although more than one conduction abnormalities were reported in the same patient with the disease, three different types of AV block in the same episode is very rare reported case to our knowledge.

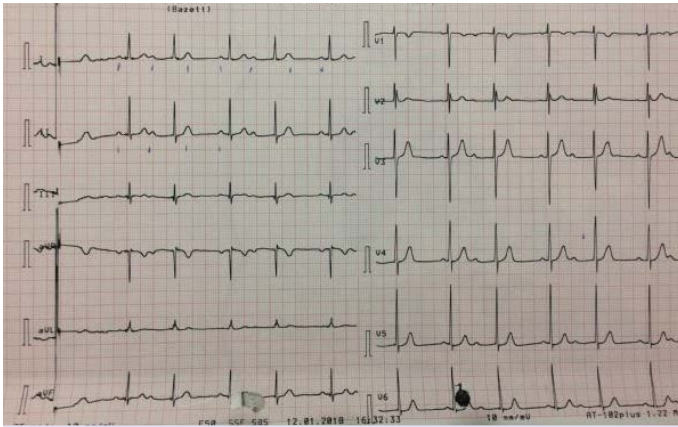
*Received:* December 27, 2019 *Accepted:* December 14, 2020 *Online:* December 16, 2020

**Correspondence:** Kahraman YAKUT, MD. Bezmialem Vakif Universitesi Tip Fakultesi, Cocuk Kardiyoloji Anabilim Dalı, Istanbul, Turkey.

Tel: +90 505 266 50 36 e-mail: kahramanyakut@gmail.com

© Copyright 2020 by Istanbul Provincial Directorate of Health - Available online at [www.northclinist.com](http://www.northclinist.com)





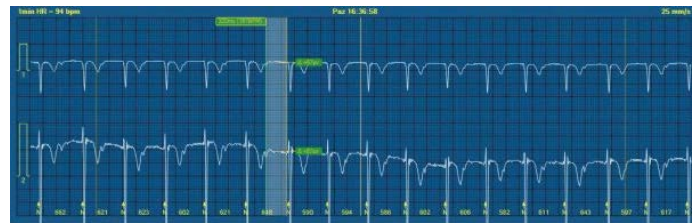
**FIGURE 1.** Basal ECG consistent with second-degree atrioventricular block type I.

## CASE REPORT

Palpitation was the chief complaint of 15 years old male patient who visited emergency department. Two weeks ago, antibiotic was prescribed to him as he had sore throat and fever, but he was not compliant with the treatment. Physical examination findings were normal except dysrhythmia during emergency examination. Electrocardiogram showed 74 beat PER minute ventricular rate with second degree type I AV block (Fig. 1). In medical history, tonsillectomy was performed to the patient at 6 years old because of frequent tonsillopharyngitis, and patient's mother had rheumatic heart disease. In the laboratory studies, C-reactive protein (CRP) was 13 mg/dl (Normal range: <5 mg/dl), anti-streptolysine O (ASO) was 599 IU/ml (Normal range: <250IU/ml) and erythrocyte sedimentation rate (ESR) was 77 mm/hour. Echocardiography revealed moderate rheumatic mitral valve regurgitation. Cardiothoracic ratio was %47 on the chest X-ray. Arthralgia on both knees and ankles as well as right first metatarsophalangeal arthritis developed on the third day of admission. Fulfilled two major, one minor criteria in the presence of supporting evidence of GAS infection, the case was diagnosed with acute rheumatic fever. Anti-inflammatory therapy with naproxen sodium (20 mg/kg/day, BID) and antibiotic therapy with benzathine penicillin G were started. Brief episode of complete AV block was seen on 24 hours rhythm holter (Fig. 2) and the rest of the record demonstrated marked first-degree AV block (Fig. 3, PR interval: 320 msn). Prompt resolution of joints manifestations was observed in the second day of anti-inflammatory therapy. The PR interval was prolonged during the acute phase of the disease,



**FIGURE 2.** Complete AV block was revealed in 24-hour rhythm Holter recordings.



**FIGURE 3.** First degree AV block pattern in was revealed in 24-hour rhythm Holter recordings.

but PR interval shortened (135 msec) after normalization of acute phase reactants.

One week after discontinuation of anti-inflammatory treatment, PR interval prolonged to 220 msec again meanwhile acute phase reactants were elevated. These findings were explained with ARF relapse. Anti-inflammatory therapy was resumed and administered for 3 weeks. PR interval returned to normal once acute phase reactants were normal. This case has received penicillin prophylaxis since he was diagnosed with ARF and his outpatient visits has been made regularly for 6 months. During follow-up, dysrhythmias was not seen again neither on ECG nor on 24-hour rhythm Holter recordings. Informed consent was obtained from patient and family for this study.

## DISCUSSION

Acute rheumatic fever remains the most common cause of acquired heart disease in some countries in the world. The most common conduction abnormality associated with the disease is first degree AV block which is also one of minor criteria [2–4]. The incidence of first-degree AV block during acute rheumatic fever episode has been reported between 34.2% and 72.3% [5, 6]. In addition to first-degree AV block, advanced degree AV blocks, junctional rhythm, premature atrial contractions, ventricular extrasystoles and ventricular/supraventricular tachycardias were observed in acute rheumatic fever patients [2–

9]. Zalstein et al. found first-degree AV block in 72.3% of patients, Mobitz type I AV block in 1.5% and complete AV block in 4.6% of patients in their study [7]. Agnew et al. demonstrated various type of transient AV conduction abnormalities in 8.5% of patients with the rate of second- and third-degree AV block 2.5%. Also, nodal rhythm was seen in 6% of patients in the same study [8]. It was rarely reported cases who experienced both Mobitz type II and third-degree AV block in the same ARF episode [7, 10]. Karacan et al. showed that analyzing 24-hour rhythm Holter recordings demonstrated more ARF patients had rhythm disturbances than had been previously recognized [2]. We identified third-degree AV block in our patient by evaluating rhythm Holter recordings.

Although the mechanism of AV block in ARF has not been fully understood, it has been speculated that an increase in vagal tone and immunologic effect on AV node could be two causes. Conduction abnormalities associated with ARF are usually self-limited and improve in several weeks after initiation of nonsteroidal anti-inflammatory therapy [8, 10, 11]. Some studies have reported a good response to corticosteroids [12, 13]. This shows that corticosteroids may be a good option in the treatment of advanced degree AV block due to ARF. On the other hand, permanent pacemaker implanted cases with AV block that caused syncope and hemodynamic instability were reported both in adult and pediatric literature [14, 15]. As literature showed rhythm problems of our cases resolved with the anti-inflammatory treatment.

We presented an uncommon case diagnosed with ARF and three types of AV block. The lesson we learnt from this experience is that ARF should come to mind when one encounter with particularly first-degree AV block but also other type of AV blocks. Twenty-four-hour rhythm Holter monitorization is a useful tool to reveal rhythm abnormalities in ARF patients.

**Informed Consent:** Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study has received no financial support.

## REFERENCES

1. Gewitz MH, Baltimore RS, Tani LY, Sable CA, Shulman ST, Carapetis J, et al. American Heart Association Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease of the Council on Cardiovascular Disease in the Young. Revision of the Jones Criteria for the diagnosis of acute rheumatic fever in the era of Doppler echocardiography: a scientific statement from the American Heart Association. *Circulation* 2015;131:1806-18.
2. Karacan M, Işıkay S, Olgun H, Ceviz N. Asymptomatic rhythm and conduction abnormalities in children with acute rheumatic fever: 24-hour electrocardiography study. *Cardiol Young* 2010;20:620-30.
3. Ceviz N, Celik V, Olgun H, Karacan M. Accelerated junctional rhythm in children with acute rheumatic fever: is it specific to the disease? *Cardiol Young* 2014;24:464-8.
4. Balli S, Oflaz MB, Kibar AE, Ece I. Rhythm and conduction analysis of patients with acute rheumatic fever. *Pediatr Cardiol* 2013;34:383-9.
5. Erişçi S, Dönmez YN. The Frequency of Rhythm and Conduction Abnormalities and Benefits of 24-Hour Holter Electrocardiogram on Detecting These Abnormalities In Patients With Acute Rheumatic Fever. *East J Med* 2019;24:303-9.
6. Yahalom M, Jerushalmi J, Roguin N. Adult acute rheumatic fever: a rare case presenting with left bundle branch block. *Pacing Clin Electrophysiol* 1990;13:123-7.
7. Zalstein E, Maor R, Zucker N, Katz A. Advanced atrioventricular conduction block in acute rheumatic fever. *Cardiol Young* 2003;13:506-8.
8. Agnew J, Wilson N, Skinner J, Nicholson R. Beyond first-degree heart block in the diagnosis of acute rheumatic fever. *Cardiol Young* 2019;14:1-5.
9. Liberman L, Hordof AJ, Alfayyadh M, Salafia CM, Pass RH. Torsade de pointes in a child with acute rheumatic fever. *J Pediatr* 2001;138:280-2.
10. Hubail Z, Ebrahim IM. Advanced heart block in acute rheumatic fever. *J Saudi Heart Assoc* 2016;28:113-5.
11. Carano N, Bo I, Tchana B, Vecchione E, Fantoni S, Agnetti A. Adams-Stokes attack as the first symptom of acute rheumatic fever: report of an adolescent case and review of the literature. *Ital J Pediatr* 2012;38:61.
12. Reddy RV, Chun LT, Yamamoto LG. Acute rheumatic fever with advanced degree AV block. *Clin Pediatr (Phila)* 1989;28:326-8.
13. Kibar AE, Erdem S, Oflaz MB. A Rare Heart Rhythm Problem in Acute Rheumatic Fever: Complete Atrioventricular Block. *J Clin Anal Med* 2015;6:775-7.
14. Oba Y, Watanabe H, Nishimura Y, Ueno S, Nagashima T, Imai Y, et al. A Case of Adult Onset Acute Rheumatic Fever With Long-Lasting Atrioventricular Block Requiring Permanent Pacemaker Implantation. *Int Heart J* 2015;56:664-7.
15. Argun M, Baykan A, Ozyurt A, Pamukcu O, Uzum K, Narin N. Syncope due to complete atrioventricular block and treatment with a transient pacemaker in acute rheumatic fever. *Turk Pediatri Ars* 2018;53:197-9.