Turk Kardiyol Dern Ars 2017;45(8):752-754 doi: 10.5543/tkda.2017.84553

CASE REPORT

# Severe cardiac toxicity following alcohol intake in a patient using therapeutic dose of propafenone

## Terapötik dozda propafenon kullanmakta olan bir hastada alkol kullanımı sonrası gelişen ciddi kardiyak toksisite

**Zübeyde Bayram, M.D., Ahmet Güner, M.D., Cem Doğan, M.D., Fatih Yılmaz, M.D., Nihal Özdemir, M.D.**

Department of Cardiology, Kartal Koşuyolu Yüksek İhtisas Training and Research Hospital, İstanbul, Turkey

***Summary–*** An unconscious, 25-year-old, male patient was brought to the emergency department. The patient's electrocardiography demonstrated a wide QRS interval and first-degree atrioventricular block. He was being treated with propafenone twice daily (450 mg) for paroxysmal atrial fibrillation. The patient had consumed a substantial amount of alcohol the day before. He recovered after supportive management with sodium bicarbonate and inotropic therapy. In the presently described case, treatment resulted in quick normalization of QRS interval and stabilization of hemodynamic status.

***Özet–*** Yirmi beş yaşında erkek hasta acil servise bilincini yitirmiş olarak getirildi. Hastanın elektrokardiyografisinde QRS genişlemesi ve birinci derece atriyoventriküler blok görüldü. Hasta nöbetli atriyum fibrilasyonu nedeniyle günde iki kez propafenon kullanıyormuş (450 mg). Hastanın bir gün önce alkol kullanımı öyküsü de mevcuttu. Hasta sodyum bikarbonat ve inotrop destekleyici tedavi sonrasında iyileşti. Sunulan bu olguda, uygulanan tedavi sonucunda QRS genişlemesinin ve hemodiamik durumun düzelmesini sağlandı.

Propafenone is a Vaughan Williams class I antiarrhythmic agent. It is used in the treatment of supraventricular tachyarrhythmias. In particular, it is used to convert atrial fibrillation to sinus rhythm. Rarely, the therapeutic dose can lead to cardiac or non-cardiac toxicity.[1]

## CASE REPORT

An unconscious, 25-year-old, male patient was admitted to the emergency department (ED). On paramedic arrival, he was lethargic and his blood pressure was not measurable. In the ED, his initial electrocardiography (ECG) showed widened QRS interval (210 milliseconds), prolonged QTc (610 milliseconds), bradycardia (56/bpm) with trifascicular block (PR interval: 240 milliseconds) (Fig. 1). First, he was treated with aggressive fluid resuscitation and dopamine infusion (up to15 mcg/kg/minute). Transthoracic echocardiography revealed an ejection fraction of 55%. Electrolyte levels, liver function test, and cardiac biomarkers were within the normal range, but arterial blood gas indicated metabolic acidosis (pH 7.23, bicarbonate 16.5 mmol/L, potassium: 4.1 mmol/L). He had a prior history of paroxysmal atrial fibrillation. Further questioning revealed that he was being treated with propafenone twice daily (300 mg+150 mg), and that he had ingested a substantial amount of alcohol the day before. At this point, propafenone toxicity was the preliminary diagnosis. Within 10 minutes of arrival, he had a generalized tonic-clonic seizure which was terminated with intravenous administration of 5 mg diazepam. The patient was intubated and his condition deteriorated rapidly. He suffered cardiac arrest.

**Abbreviations:**

| | |
|---|---|
| *CPR* | *Cardiopulmonary resuscitation* |
| *ECG* | *Electrocardiogram* |
| *ED* | *Emergency department* |
| *ICU* | *Intensive care unit* |

*Received:* February 27, 2017 *Accepted:* May 17, 2017

*Correspondence:* Dr. Ahmet Güner. Kartal Koşuyolu Yüksek İhtisas Eğitim ve Araştırma Hastanesi, Kardiyoloji Kliniği, Kartal, İstanbul, Turkey.
Tel: +90 216 - 500 15 00 e-mail: ahmetguner488@gmail.com

Cardiopulmonary resuscitation (CPR) was initiated, and after 3 cycles of CPR, return of spontaneous circulation was achieved, with blood pressure of 110/65 mmHg. A total of 2 mg atropine, 5 mg bolus epinephrine and intravenous sodium bicarbonate (50 mL/hour) were administered due to the possibility of propafenone toxicity. After initial stabilization in the ED, he was transferred to the intensive care unit (ICU). After 10 hours, the QRS, QTc, and PR interval gradually decreased (110, 430, and 150 milliseconds, respectively) (Fig. 2). The patient was discharged from the ICU on the third day as a result of refusal of further treatment. After a month of follow-up, he was doing well.

## DISCUSSION

In this case report, we presented a patient who was taking a therapeutic dose of propafenone for paroxysmal atrial fibrillation and developed serious cardiac toxicity, with cardiac arrest occurring in the hospital. The diagnosis was likely propafenone toxicity; however, we could not be certain because the necessary equipment to measure the serum propafenone level was not available at the hospital. Nonetheless, the ECG findings, clinical status on admission, tonic-clonic seizure, absence of electrolyte imbalances, and no use of any drugs other than propafenone led us to concentrate on this diagnosis. There have been a few cases of propafenone poisoning with similar symptoms in which cardiac features predominate, including widening QRS interval, hypotension, and trifascicular block.[2,3] Seizure was rarely seen in these cases, however.[2,4] Concomitance of seizure on admission makes this case noteworthy.

The other important point is that a therapeutic dose of propafenone was sufficient to cause cardiac toxic-

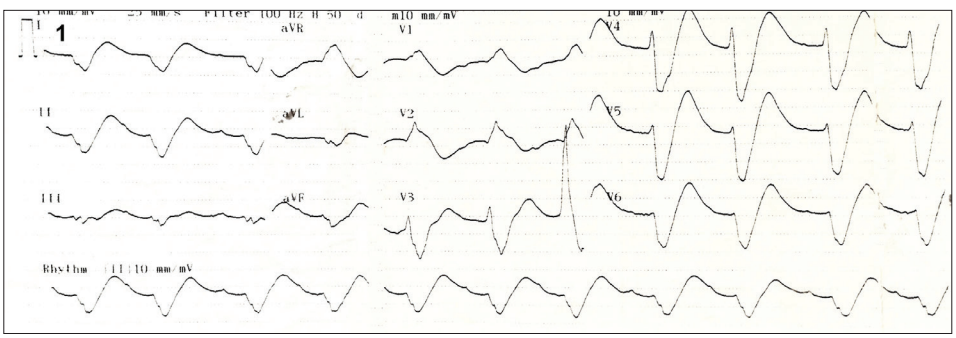


**Figure 1.** Electrocardiography at presentation.

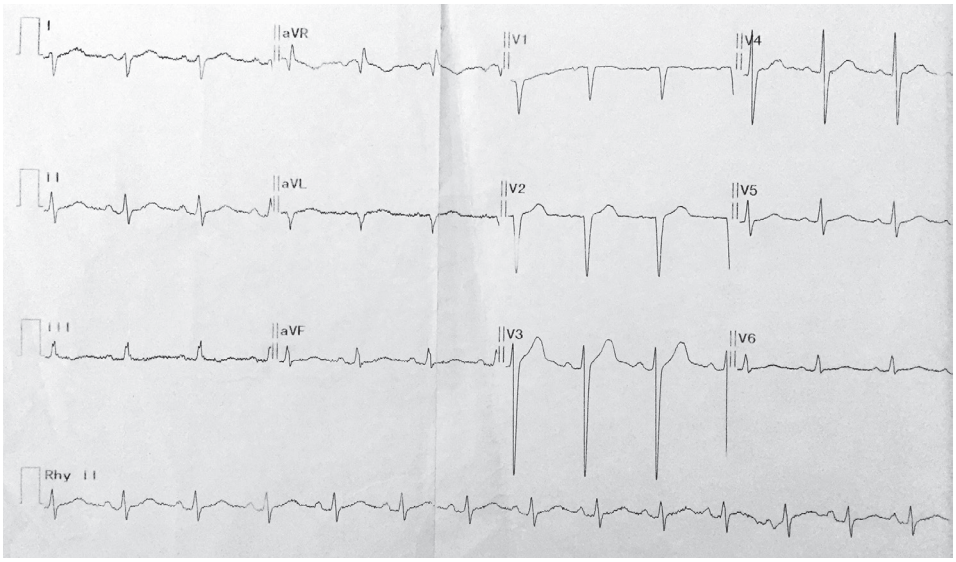


**Figure 2.** Electrocardiography after sodium bicarbonate administration.

ity. Propafenone pharmacodynamics and drug interactions should be considered in order to understand etiology.[2,5] Propafenone is metabolized in the liver via the cytochrome P450 2D6 (CYP2D6) pathway.[2,5] CYP2D6 is known to be an enzyme with numerous substrates, including drugs and alcohol. Some people are poor metabolizers of propafenone due to a CYP2D6-enzyme genetic polymorphism. Even a low dose of propafenone medication may cause cardiac toxicity in poor metabolizers or patients who have consumed drugs that inhibit CYP2D6.[6] In the present case, the patient had consumed a substantial amount of alcohol the day before admission, which could have caused a critical increase in the serum propafenone level.[2] The distinguishing features of our case from other cases in the literature are the seizure and serious cardiac toxicity observed as a result of a low dose of propafenone and drug interactions.

## Conclusion

Propafenone is a well-accepted agent for the treatment of paroxysmal atrial fibrillation. However, it may cause severe cardiac toxicity, even in therapeutic doses. Propafenone pharmacodynamics and drug interactions are important in understanding the etiology of toxicity. In this case of severe propafenone-related cardiac toxicity, intravenous sodium bicarbonate led to significant clinical improvement. The management of propafenone toxicity consists of hemodynamic and respiratory stabilization together with alkalinization of the blood via sodium bicarbonate.

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

**Peer-review:** Externally peer-reviewed.

**Conflict-of-interest: None declared.**

**Authorship contributions:** Concept – Z.B., A.G.; Design – A.G.; Supervision – N.Ö.; Materials – Z.B., A.G.; Data collection – A.G., F.Y., C.D.; Analysis and/or interpretation – A.G., C.D.; Literature search – F.Y., C.D.; Writing – A.G.

## REFERENCES

1. Dogan A, Ergene O, Nazli C, Kinay O, Altinbas A, Ucarci Y, et al. Efficacy of propafenone for maintaining sinus rhythm in patients with recent onset or persistent atrial fibrillation after conversion: a randomized, placebo-controlled study. Acta Cardiol 2004;59:255–61. [CrossRef]
2. Samaan RA, Sobamowo HO, Tamburrino F, Grodman R, Isber N. Syncope, widened QRS interval, and left ventricular systolic depression: coincident with propafenone therapy for atrial fibrillation. Tex Heart Inst J 2010;37:476–9.
3. Garimoldi M, Sghirinzetti M, Pirastu A, Cappiello E, Sala R, Terranova P. Propafenone in ventricular hyperkinetic arrhythmias. Dynamic ECG evaluation of the acute oral test and short-term treatment. G Ital Cardiol 1986;16:328–32.
4. Kerns W 2nd, English B, Ford M. Propafenone overdose. Ann Emerg Med 1994;24:98–103. [CrossRef]
5. W Daniell MDH. Cytochrome P450-2D6 Genotype Definition May Improve Therapy for Paroxysmal Atrial Fibrillation A Case of Syncope Following "Pill-in-the-Pocket" Quinidine plus Propafenone. J Atr Fibrillation 2014;6:978.
6. Ovaska H, Ludman A, Spencer EP, Wood DM, Jones AL, Dargan PI. Propafenone poisoning-a case report with plasma propafenone concentrations. J Med Toxicol 2010;6:37–40.

*Keywords:* Propafenone; QRS; toxicity.

*Anahtar sözcükler:* Propafenon; QRS; toksisite.