Case Report

Eurasian Journal of Toxicology

Spontaneous Resolution of Arrhythmia in Propafenone Intoxication: A Rare Case Report

Tugce YILMAZ[1], Merve OSOYDAN SATICI[1], Mehmet Muzaffer ISLAM[1], Serdar OZDEMIR[1], Serkan Emre EROGLU[1], Gokhan AKSEL[1]

[1]Department of Emergency Medicine, Universty of Health Sciences, Umraniye Research and Training Hospital, Istanbul, Turkey

Abstract

Propafenone toxicity is rare but poses a life-threatening condition due to malignant arrhythmias. However, there is currently no recommended standard specific treatment or antidote. In our case, we presented a young patient with transient cardiac toxicity and spontaneous recovery in her follow up after taking high-dose propafenone for suicide attempt. Electrocardiography showed sinus rhythm with prolongation of PR interval with 240 ms, QRS width 160 ms, and corrected QT interval QTc with 498 ms; Terminal R wave observed in leads V1 and aVR and metabolic acidosis was also observed at the time of admission. In patient's follow up, sodium bicarbonate and lipid emulsion treatment was planned but did not applied due to the resolution of cardiotoxic arrhythmia in 30 minutes after her admission, and metabolic acidemia was observed to regress with supportive treatment. In conclusion, propofenone intoxication, like other class 1C antiarrhythmics, is a life-threatening, rarely reported toxicity that complicates clinical decisions. It is critical to be aware that propofenone overdose can be fatal, and is also essential to remember that, despite the lack of an antidote, total recovery can be accomplished with constant monitoring and supportive treatment.

Keywords: Propafenone, intoxication, arrythmia, sodiumbicarbonate

Özet

Propafenon toksisitesi nadirdir ancak malign aritmiler nedeniyle yaşamı tehdit eden bir tablo oluşturur. Bununla birlikte, spesifik bir tedavi veya panzehir bulunmamaktadır. Olgumuzda, özkıyım amacı ile yüksek doz propafenon alımı sonrası geç başvuruda geçici kardiyak toksitite gözlenen ve spontan iyileşme görülen genç bir hastayı sunduk. Başvuru sırasında elektrokardiyografide PR intervalinin 240 ms ile , QRS genişliğinin 160 ms ile ve düzeltilmiş QT intervalinin 498 ms ile uzamış olduğu bir sinüs ritmi görüldü. V1 ve aVR'de terminal R dalgası mevcuttu ve metabolik asidoz gözlendi. Hastanın takibinde sodyum bikarbonat ve lipid emülsiyon tedavisi planlandı. Ancak başvurudan 30 dakika sonra kardiyotoksik aritmi düzeldiği için uygulanmadı ve destek tedavisi ile metabolik asidozun gerilediği gözlendi. Sonuç olarak propofenon intoksikasyonu, diğer sınıf 1C antiaritmikler gibi, yaşamı tehdit eden, nadiren bildirilen ve klinik kararları zorlaştıran bir toksisitedir. Bu nedenle mortal seyredebileceği bilinmeli, antidotu olmasa da yakın izlem ve destek tedavi ile tam iyileşme sağlanabileceği unutulmamalıdır.

Anahtar Kelimeler: Propafenon, intoksikasyon, aritmi, sodyum bikarbonat

Introduction

Propafenone is a class 1C antiarrhythmic agent used for the treatment of ventricular, supraventricular tachycardia and atrial fibrillation. Although propafenone intoxication is rare, survival is usually very low due to malignant arrhythmias[1]. Supportive therapy is the mainstay of treatment, and when no response is obtained, treatments such as sodium bicarbonate, buffering with insulin-dextrose, glucagon, calcium, intravenous lipid emulsion and pacemaker have been reported to be beneficial in a limited number of cases[2-4]. However, there is currently no recommended specific treatment or antidote[3]. In our case, we presented a young patient with transient cardiac toxicity and spontaneous recovery in her follow up after taking high-dose propafenone for suicide and aimed to emphasize the importance of supportive treatment in intoxication.

Case Report

A 19-year-old female patient admitted to the emergency department with complains of nausea and vomiting started approximately 18 hours after oral intake of 30 (total 4500mg) propafenone tablets for suicid attempt. Her anamnesis revealed that she had no chronic disease and regularly used medication, and that propefonone belonged to her parents. On examination, patient was well oriented and cooperative, and her glasgow coma scale was evaluated as 15. Vital signs were observed as; SpO2 in room air: 99%, heart

Corresponding Author: Tugce YILMAZ **e-mail:** tugceyilmaz2309@gmail.com
Received: 02.03.2022 • **Revision:** 02.04.2022 • **Accepted:** 11.04.2022
Cite this article as: Yilmaz T, Osoydan Satici M, Islam MM, Ozdemir S, Eroglu SE, Aksel G. Spontaneous Resolution of Arrhythmia in Propafenone Intoxication: A Rare Case Report. Eurasian J Tox. 2022;4(1): 29-31

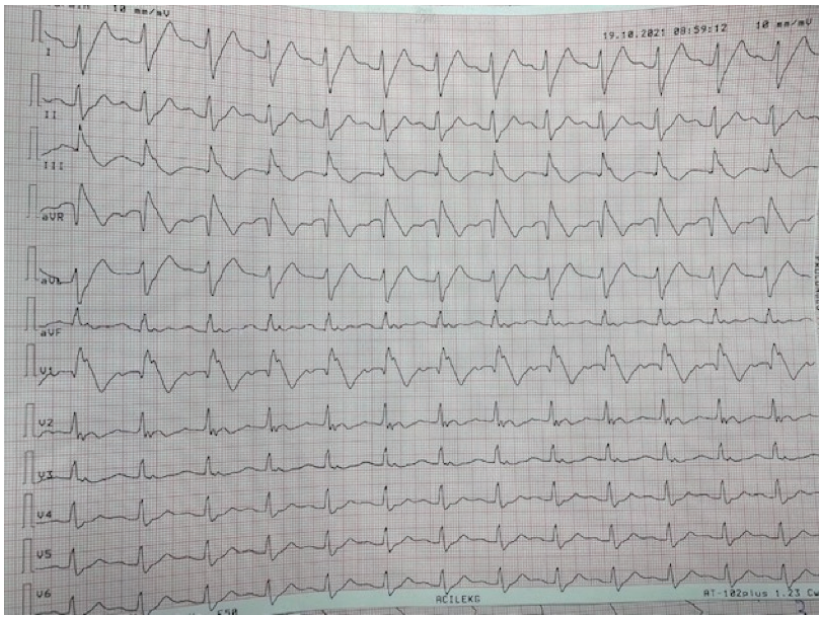

Figure 1: The patient's ECG at admission shows sinus rhythm with PR prolongation up to 240 ms, QRS width 160 ms, and QTc 498 ms in lead II, and terminal R wave in leads V1 and aVR

rate: 99 beats per minute, blood pressure 108/71 mmHg, respiratory rate 18/minute, fever 36.1 °C. Her skin perfusion was normal, pupillary isochoric light reflex was normal bilaterally, and no pathological finding was detected in other systemic examination. Electrocardiography (ECG) showed sinus rhythm with prolongation of PR interval with 240 ms, QRS width 160 ms, and corrected QT interval QTc with 498 ms; Terminal R wave observed in leads V1 and aVR (Figure 1). The patient was followed up with close monitoring and symptomatic treatment was started; 1gr/kg activated charcoal was administered every 6 hours, and hydration was provided with intravenous 0.9 % NaCl isotonic bolus doses. Metabolic acidosis was observed as pH: 7.081, pCO2: 25.3, HCO3: 15, lactate: 9 in the arterial blood gas sampled at the time of admission, however all other laboratory parameters of the patient were within the normal range. Sodium bicarbonate treatment was planned for the patient with stable hemodynamics, due to QRS enlargement in the ECG, but sodium bicarbonate treatment was not given due to the dramatic improvement in the ECG (Figure 2), which was repeated at the 30th minute of admission after symptomatic treatment. The patient, whose metabolic acidosis regressed gradually, did not have additional cardiotoxicity and was transferred to the intensive care unit for follow-up. After a 24-hour intensive care follow-up, the patient was discharged, with full recovery.

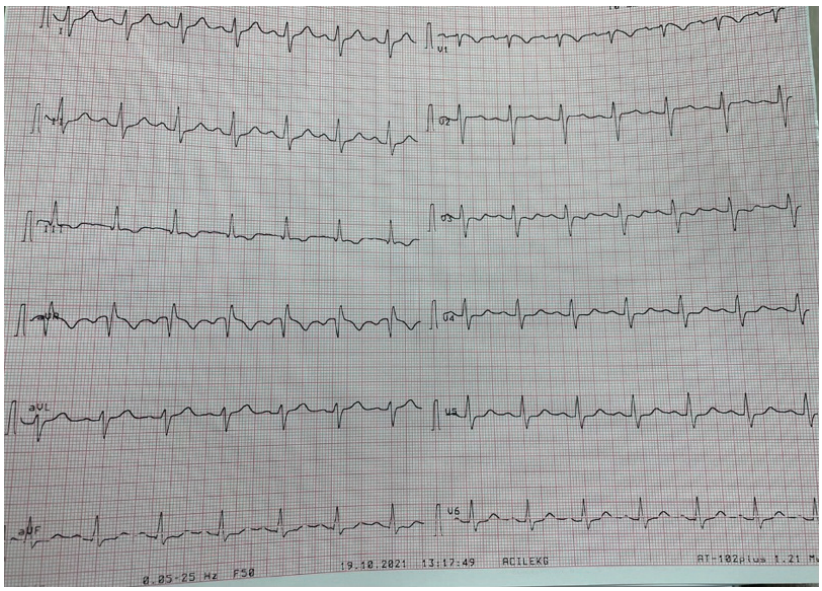

Figure 2: Normal sinus rhythm is seen in the ECG of the patient taken 30 minutes after admission

Discussion

Propafenone exerts its effect by inhibiting action potentials in cardiac sodium channels. It also inhibits β-adrenergic receptors and calcium receptors and has a negative inotropic effect. Although being a proarrhythmic agent, propafenone may cause cardiac and other adverse effects, even at therapeutic doses (300-900 mg/day)[1]. Propafenone toxicity is rare but poses a life-threatening condition. Coma, seizure, cardiac arrest, bradycardia, conduction abnormalities (sinoatrial, atrioventricular, and intraventricular blocks) or tachycardia (ventricular tachycardia), PR prolongation, QRS and QT interval widening, and Brugada phenocopy may occur[3-5]. In our case, PR prolongation, QRS and QT interval widening were observed, and no hemodynamic instability was observed.

Following oral administration, propafenone is nearly completely absorbed (% 90). However, because of a first-pass hepatic elimination effect, its bioavailability is unpredictable[3,6]. Propafenone is metabolized into two major metabolites: 5-hydroxypropafenone and norpropafenone, a process genetically determined by the CYP2D6 enzyme system. The propafenone elimination half-time varies depending on whether the patient is a poor or an extensive metabolizer[3,6].

Although the half-life is short at 5-7 hours, it has been reported that elimination may take up to 17-24 hours in 10% of patients who are genetically poor metabolisers[5]. Therefore, close 24-hour monitoring may be required. We thought that the spontaneous recovery of cardiotoxicity during follow-up in our case may be due to drug elimination due to late admission. Propafenone intoxication is associated with doses between 1800 and 9000 mg, and serum concentrations as high as 12,000 ng/mL have been reported[6]. Although a total intake of 4500 mg propafenone was detected in our case, the serum concentration at the time of admission is not known since the blood level could not be studied in our center.

The treatment of propafenone intoxication is controversial and there is no consensus on the actual treatment.Therefore, it is essential to focus on hemodynamic support after poisoning. Activated charcoal administration, intravenous glucagon, sodium bicarbonate, hypertonic saline, insulin and lipid emulsion therapy are beneficial[5]. Theoretically, sodium bicarbonate is effective in sodium channel blocking agent toxicity, but in a study with class 1C antiarrhythmics, bicarbonate alone was not effective in reversing ECG effects at therapeutic doses[7]. Again, in an animal research study comparing the efficacy of insulin and sodium bicarbonate therapy in acute propafenone toxicity, insulin therapy was found to be more effective[8]. In our case, sodium bicarbonate and lipid emulsion treatment was not applied due to the resolution of cardiotoxic arrhythmia in a very short time after her admission, and metabolic acidemia was observed to regress with supportive treatment.

Conclusion

Inconclusion, propofenone intoxication, like other class 1C antiarrhythmics, is a life-threatening, rarely reported toxicity that complicates clinical decisions. It is critical to be aware that propofenone overdose can be fatal, and is also essential to remember that, despite the lack of an antidote, total recovery can be accomplished with constant monitoring and supportive treatment.

References

1. Funck-Brentano C, Kroemer HK, Lee JT, Roden DM. Propafenone. N Engl J Med. 1990;322(8):518-25.
2. Saz EU, Ucar SK, Ulger Z, Ersel M, Cevik C, Karapinar B. Successful treatment of suicidal mega dose of propafenone intoxication-a case report. Kardiol Pol 2010;68(11):1284–5.
3. Wozakowska-Kapłon B, Stezpien-Walek A. Propafenone over-dose: cardiac arrest and full recovery. Cardiol J 2010;17(6):619–22.
4. Bayram B, Dedeoglu E, Hocaoglu N, Gazi E. Propafenone-in-duced cardiac arrest: full recover with insulin, is it possible? Am J Emerg Med 2013;31(2):45.
5. 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(1):37-40.
6. Clarot F, Goullé JP, Horst M, Vaz E, Lacroix C, Proust B. Fatal propafenone overdoses: case reports and a review of the literature. J Anal Toxicol. 2003;27(8):595-9.
7. Pentel PR, Fifield J, Salerno DM. Lack of effect of hypertonic sodium bicarbonate on QRS duration in patients taking therapeutic doses of class IC antiarrhythmic drugs. J Clin Pharmacol. 1990;30(9):789-94.
8. Yi HY, Lee JY, Lee WS, Sung WY, Seo SW. Comparison of the therapeutic effect between sodium bicarbonate and insulin on acute propafenone toxicity. Am J Emerg Med. 2014;32(10):1200-7.