Case Report

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Complete Heart Block Following Anaphylaxis: A Case Report and Literature Review

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Abstract

Allergic reactions can range from mild symptoms to life-threatening anaphylaxis, and they may involve significant cardiovascular consequences. Anaphylaxis can cause disturbances in the conduction system, including complete heart block. This case report describes a patient who developed complete heart block following the administration of cefixime, a third-generation cephalosporin. The condition required the insertion of a pacemaker during the patient's follow-up. This report underscores the importance of monitoring and managing cardiovascular effects in patients experiencing severe allergic reactions, particularly when using certain antibiotics like cefixime.

Keywords: Anaphylaxis, third-generation cephalosporin, complete heart block, Kounis syndrome

Introduction

Conduction disorders in the atrioventricular (AV) node may be transient, intermittent, or permanent. They may be due to physiological changes, such as increased vagal tone, or they may occur due to pathological causes, such as congenital ischemic heart disease, valve diseases, and iatrogenic drugs. Cases of AV block that develop due to drugs and require permanent pacemaker insertion have been reported in the literature (1,2). Currently, there are no specific case reports in the available literature directly associating cefixime with AV block. However, other cephalosporins, such as ceftriaxone, are associated with cardiovascular events, usually anaphylaxis or arrhythmias resulting from histamine release (3). Although cefixime is generally regarded as safe, rare cases of cardiovascular side effects, including conduction disorders, have been reported, similar to other antibiotics. This article presents a case of complete heart block induced by cefixime, a third-generation cephalosporin, which required pacemaker implantation during follow-up.

Case Presentation

A 60-year-old male patient presented to the emergency department in May 2022 with widespread rash, redness, itching, and fainting following cefixime administration. He had undergone prostate surgery for benign hyperplasia two weeks prior, and the doctor prescribed cefixime for postsurgical fever and chills. Upon his second presentation, he was referred to the cardiogenic shock clinic. Physical examination revealed bradycardia, hypotension, and altered consciousness. Electrocardiography revealed complete AV block, and the patient was subsequently taken to the coronary angiography laboratory (Figure 1). The patient was promptly managed with transvenous temporary pacemaker implantation via the femoral venous system. Coronary angiography was performed to rule out ischemic causes of complete heart block. The examination revealed no coronary lesions. Laboratory tests showed no abnormalities that could explain the AV block, and echocardiography did not reveal any valve pathology. During the patient's follow-up, it was noted that he had no previous drug allergies, and a complete

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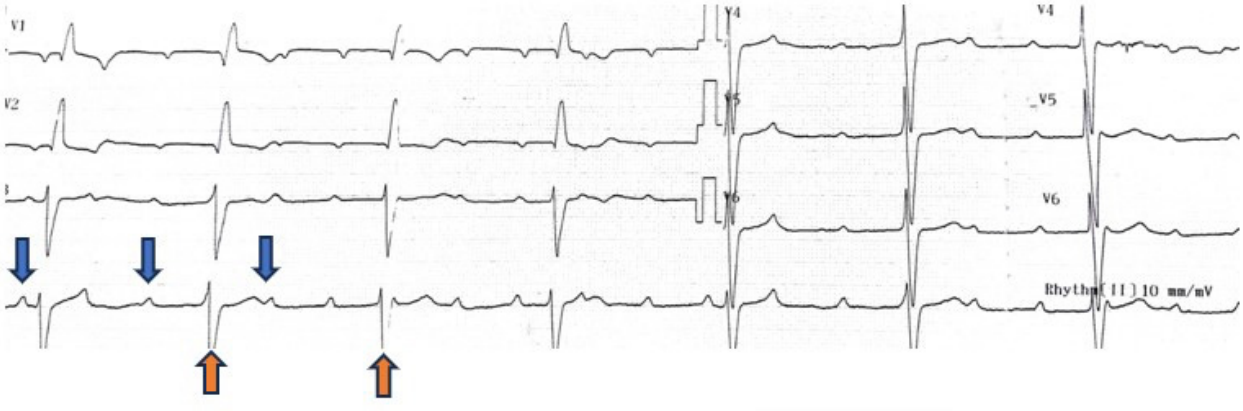

Figure 1. Admission electrocardiogram showing complete atrioventriculer block

heart block developed after the first dose of cefixime. The patient did not respond to atropine, and he was not receiving rate-limiting medications, such as beta-blockers, calcium channel blockers, or digoxin. Despite management with a temporary pacemaker for 5 days, complete AV block persisted. Consequently, they discharged him and implanted a permanent pacemaker. An informed consent form was obtained from the patient.

Discusion

AV block can be classified as physiological, pathological, idiopathic, or iatrogenic. In approximately 50% of cases, the etiology remains unknown and is classified as idiopathic. Iatrogenic AV block can occur after invasive procedures, such as cardiac surgery, catheter ablation, or transcatheter aortic valve replacement, as well as from medications that affect AV conduction. These include beta-blockers, calcium channel blockers, digoxin, adenosine, and antiarrhythmic drugs, although other non-cardiac medications may also affect conduction. Additionally, cases of acute coronary syndrome (Kounis syndrome) associated with anaphylaxis and mast cell activation due to antibiotics and other allergens have been documented (4,5). Complete AV block associated with Kounis syndrome has been previously reported in the literature (6). Studies on guinea pigs have demonstrated that anaphylactic reactions can adversely affect the conduction system. During anaphylaxis, the heart is one of the main organs that is affected. The chemicals that are released during this process can cause coronary vasospasm, arrhythmias, poor ventricular contractility, and negative inotropic effects. Histamine, through H1 receptor stimulation, causes a delay in AV conduction and constriction of epicardial coronary vessels (7). In addition to histamine, studies in guinea pigs have demonstrated that elevated endogenous adenosine levels resulting from anaphylaxis may also impair AV conduction and contribute to the development of heart block (8). The literature also reports cases of transient 2:1 AV blocks associated with contrast media-induced anaphylaxis (9). Anaphylaxis can have a wide range of clinical manifestations, ranging from mild allergic symptoms to severe cardiogenic shock following exposure to an allergenic agent. However, clinical conditions typically improve with the discontinuation of the offending substance (10). In our case, the AV block persisted. It is possible that the anaphylactic reaction intensified the underlying disease. Electrophysiological studies can be valuable in identifying organic conduction disorders.

Conclusion

This case highlights the potential for serious cardiovascular complications, such as complete heart block, following anaphylaxis and highlights the need to increase awareness of the cardiovascular effects associated with anaphylaxis.

Ethics

Informed Consent: An informed consent form was obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Y.A., A.S., Concept: N.A., Y.A., A.S., Design: N.A., Y.A., A.S., Data Collection or Processing N.A., Y.A., A.S., Analysis or Interpretation: Y.A., A.S., Literature Search: N.A., Y.A., A.S., Writing: N.A.

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