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Case Report

A Case of Sinus Bradycardia in a Patient Treated with Pulse Steroids for Adult-Onset Still's Disease

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ABSTRACT

Adult Onset Still's Disease is a rare systemic inflammatory disease. The absence of a specific clinical presentation and diagnostic biomarkers causes delays in diagnosing and treating AOSD. Steroids used in treatment have many undesirable side effects. We presented a female case with AOSD who developed sudden bradycardia after pulse steroid therapy.

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Introduction

Adult-onset Still's Disease (AOSD) is a rare systemic inflammatory disorder characterized by fever, transient salmon-pink maculopapular rash, inflammatory polyarthritis, lymphadenopathy and sore throat.[1] The aetiology of AOSD is currently unknown. Non-specific clinical presentation, lack of diagnostic biomarkers, and AOSD rarity often result in a significant delay in diagnosis and treatment.[1] Steroids are the basis of therapy. In this case of a patient diagnosed with AOSD, we investigated clinical findings, treatment and the sudden bradycardia that occurred after the patient underwent pulse steroid therapy.

Case Report

In November 2021, a 30-year-old woman applied with transient whole-body maculopapular rash, sore throat and joint pain. The patient underwent empiric antibiotic therapy as an infection could not be excluded. However, the complaints of the patient did not regress. Rheumatological workup demonstrated normal renal and hepatic parameters, negative autoantibodies, ESR 63 mm/h, CRP 262 mg/L, ferritin 4,214 µg/L, and fibrinogen 890 mg/dL (*Table 1*).

Preliminary findings were compatible with AOSD; thus, methylprednisolone treatment was initiated. Arthralgia and rash regressed after pulse

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steroid treatment, supporting AOSD diagnosis. The patient was discharged with methotrexate and prednisolone; however, the patient applied to the hospital again with an attack after five days and was admitted. A pulse steroid of 1 g/day methylprednisolone was planned for three consecutive days. After two days of pulse steroid treatment, the patient's laboratory parameters and clinical signs didn't regress. Thus, anakinra was initiated. The patient, whose pulse was within the normal range in the previous follow-ups (*Figure 1*), developed asymptomatic sinus bradycardia (*Figure 2*) after three doses of pulse steroid therapy without deterioration of other vital parameters. The patient was monitored with a holter. However, a cardiac pathology that explains bradycardia was not found, and the case has been evaluated as isolated sinus bradycardia. Bradycardia of unknown aetiology was considered secondary to pulse steroid therapy. The patient, whose clinical and laboratory parameters improved with pulse steroid and anakinra treatment, was discharged.

Discussion

Physicians frequently encounter side effects of pulse steroid therapy such as hyperglycemia, hypertension and electrolyte disturbances. However, the side effect of bradycardia is not well known. There are a few cases of sinus bradycardia developing following steroid infusion in the literature. These cases, which are usually asymptomatic, resolved spontaneously after stopping the infusion.[2] Although there is no current data in the literature, a small-scale study conducted in the patient group diagnosed with multiple sclerosis found the prevalence of steroid-induced bradycardia to be 41.9%.[3] Although this side effect mainly develops following intravenous treatment, there are a few case reports of sinus bradycardia after oral methylprednisolone.[4] The pathogenesis of sinus bradycardia developing following steroid infusion has not been fully elucidated. However, the sympathetic nervous system can exert bradycardic effects by suppressing cytokine production and function.[5]

There was no comorbid disease or drug use in our case. While other vital parameters were stable in our young patient, sinus bradycardia developed following pulse steroid therapy. It spontaneously

Table 1. The course of the patient's laboratory tests.

	Admission	Second day	10th day	Discharge
Leukocyte (/mm^3)	27,100	13,040	10,440	11,400
Neutrophil (/mm^3)	24,600	11,900	6,740	8,060
Hemoglobin (g/dL)	11	11.5	10.4	12.4
Platelet (/mm^3)	501,000	479,000	264,000	257,000
INR	0.84	0.98	0.93	0.84
Fibrinogen (mg/dL)	890	822	238	274
Ferritin (mcg/L)	4,981	3,458	835	648
CRP (mg/L)	186	78	<2	<2
ESR (mm/h)	-	61	12	13
Procalcitonin (µg/L)	0.05	0.02	0.02	0.04
ALT (U/L)	23	69	31	29
AST (U/L)	27	41	17	22
Creatinine (mg/dL)	0.53	0.60	0.57	0.64

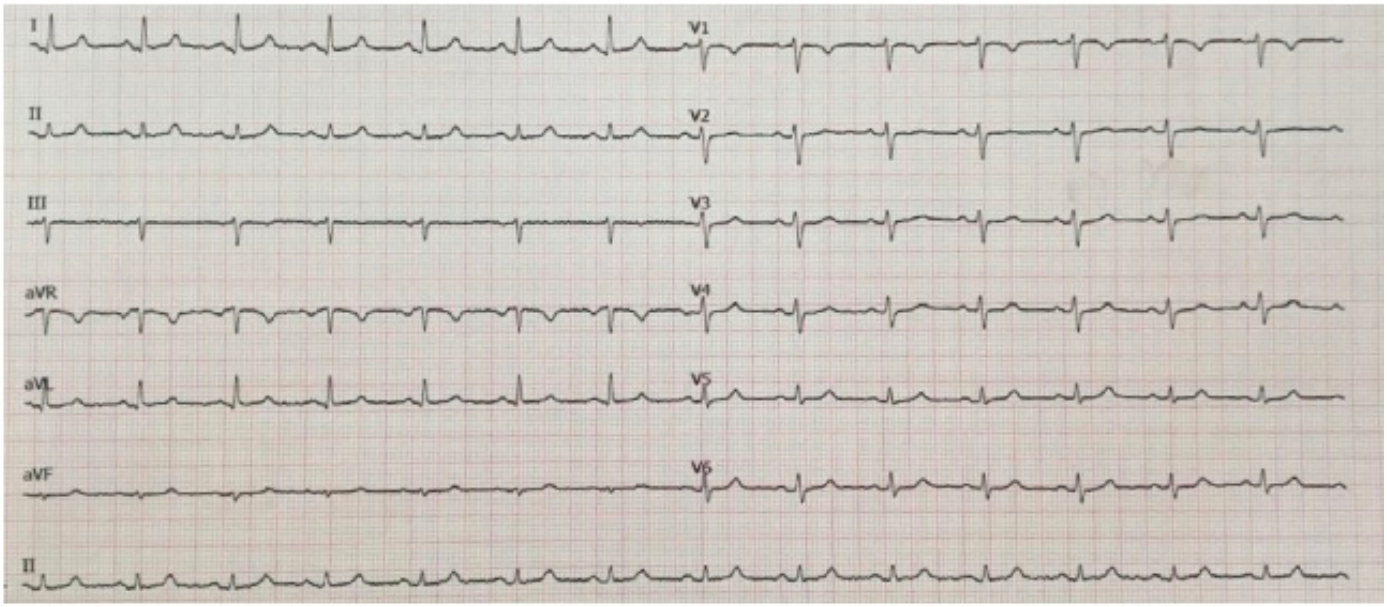

Figure 1. Electrocardiography before methylprednisolone treatment.

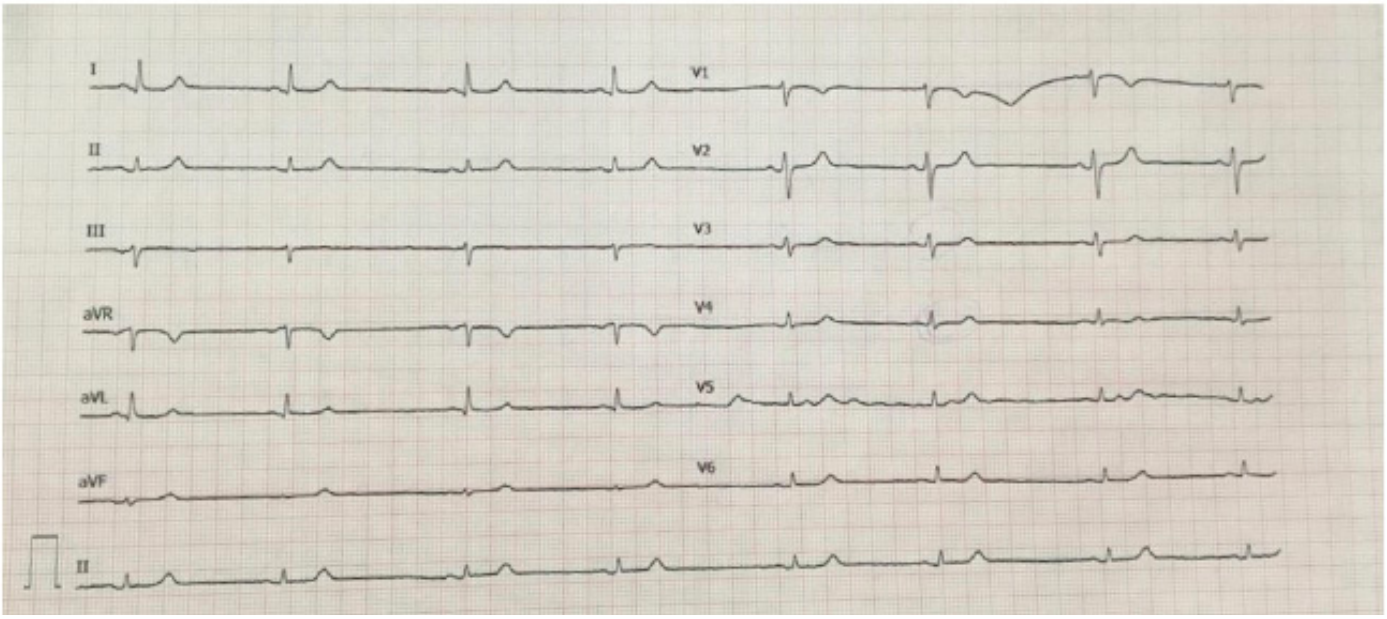

Figure 2. Electrocardiography after methylprednisolone treatment.

returned to normal rapid sinus rhythm within a few days after stopping the infusion. Therefore, we thought that sinus bradycardia was secondary to pulse steroid therapy. In the patient, the Naranjo drug side effect scale score was calculated as +6.[6] Electrolyte imbalance, underlying cardiac pathology, or steroid infusion rate increase the risk of bradycardia. Although this side effect is often asymptomatic, Guillen et al.[7] reported a case with a history of coronary artery disease that developed hypotension, bradycardia, and asystole after pulse steroids. For these reasons, bradyarrhythmia risk during pulse steroid therapy should be considered. In cases with cardiac pathology, it would be a more accurate approach to monitor the patient during the infusion and prefer prolonged infusion.

Acknowledgment

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Conflict of interest

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Authors' Contribution

Study Conception: SI, BNE; Study Design: SI, AE, BNE; Supervision: BNC, YP; Data Collection and/or Processing: SI, BNE, AE, ED; Statistical Analysis and/or Data Interpretation: SI, AE, BNC, BNE; Literature Review: SI, AE, BNC; Manuscript Preparation: SI, BNE, YP; Critical Review: BNC, SI.

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