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Case report

CASE REPORT

A spectrum of cardiac manifestations post Pfizer-BioNTech COVID-19 vaccination

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Learning points for clinicians

Safe, effective and readily accessible prophylactic vaccinations for the Coronavirus disease-19 (COVID-19) are needed with utmost urgency to protect those at risk. A wide spectrum of cardiac manifestations might present after these vaccinations. Vigilant monitoring and reporting would assist in identifying the severity of vaccine-related adverse outcomes.

In this case series, we describe three previously asymptomatic patients who presented with cardiac-related manifestations shortly after receiving the Pfizer-BioNTech COVID-19 vaccine.

The first case is a 70-year-old Chinese female with past medical history of type 2 diabetes mellitus, hypertension, hyperlipidemia and previous stroke. Six hours after receiving her first dose of vaccination, she presented to the Emergency Department with chest pain, diaphoresis and vomiting. Resting 12-lead electrocardiogram demonstrated widespread ST-segment depressions over the precordial and limb leads with ST-segment elevation in aVR (Figure 1A) with raised Troponin I 1353 ng/l (range 0.0–17.4 ng/l). The patient underwent urgent coronary angiogram, which showed 100% occlusion of the left proximal circumflex artery, diffuse 75% stenosis in the proximal-mid left anterior descending artery and 50% stenosis in the right coronary artery. Percutaneous coronary intervention of the occluded circumflex artery was performed with a drug-eluting stent.

The second case is a 44-year-old Chinese female with past medical history of mitral valve prolapse and mild mitral regurgitation. Fifteen minutes after receiving her first dose of vaccination, she reported transient chest discomfort and palpitations. She was conveyed to the Emergency Department by ambulance with her symptoms resolving on arrival. The resting 12-lead electrocardiogram on arrival showed ST-segment elevations in the inferolateral leads (Figure 1B). She declined coronary angiogram as she remained symptom-free upon medical review. Troponin I was elevated at 1539 ng/l. Transthoracic echocardiogram demonstrated mildly depressed left ventricular ejection fraction of 50% with apical ballooning. Coronary computed tomography angiography demonstrated no significant coronary artery stenosis. The diagnosis was stress-induced cardiomyopathy and she was treated conservatively.

The third case is a 73-year-old Chinese female, with medical history of hypertension, who presented to the Emergency Department for palpitations and shortness of breath. She had received her first dose of vaccination 2 h prior. Resting 12-lead electrocardiogram showed normal sinus rhythm without ischemic changes. Troponin I was elevated at 39 ng/l and peaked at180 ng/l 6-h later. She underwent emergent coronary angiogram that showed single-vessel coronary artery disease with hemodynamically nonsignificant moderate left anterior descending artery lesion, as confirmed by fractional flow reserve (FFR 0.83). Transthoracic echocardiogram showed left ventricular ejection fraction of 60% with no regional wall motion abnormalities. The final diagnosis was myocardial infarction with nonobstructive coronary arteries.

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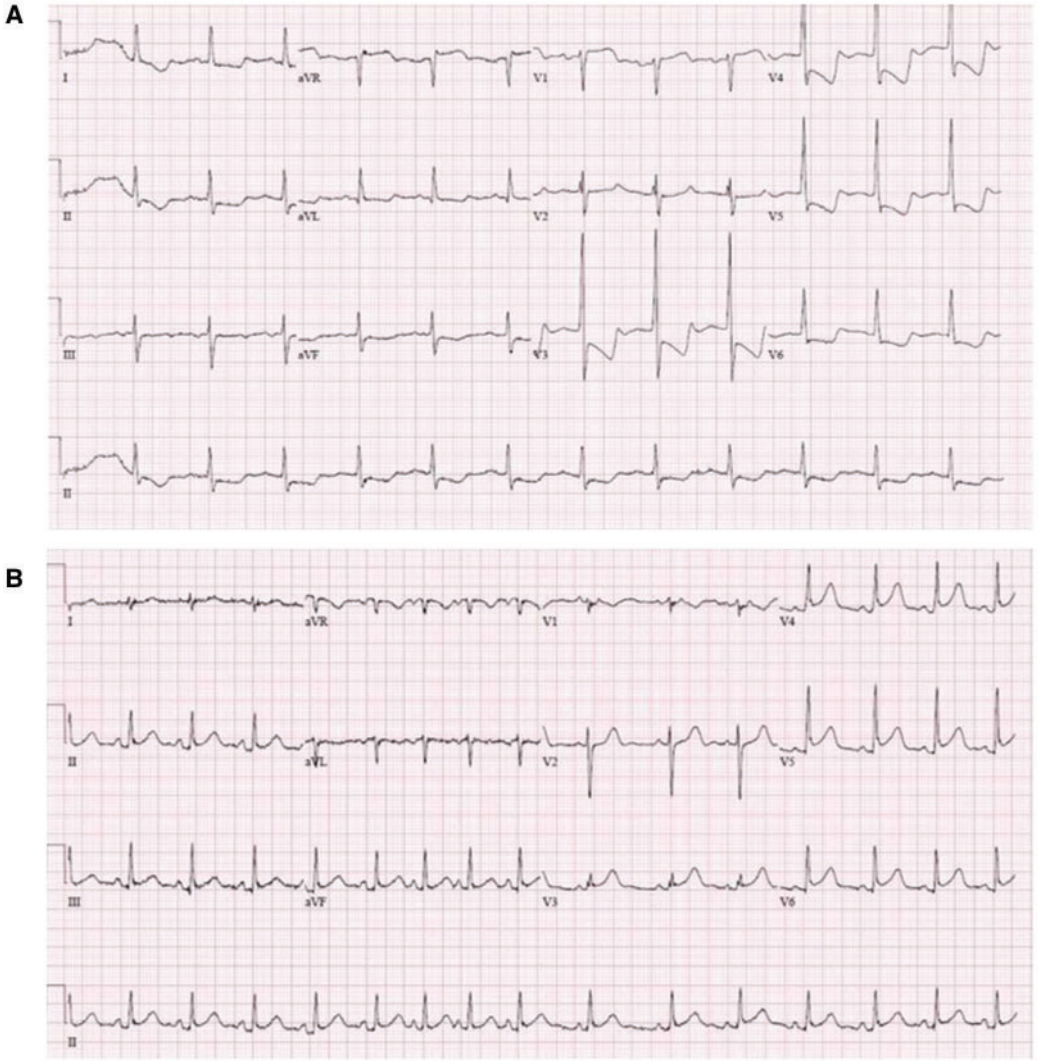

Figure 1. (**A**) Resting 12-lead electrocardiogram demonstrating widespread ST-segment depressions over the precordial and limb leads with ST-segment elevation in aVR. (**B**) Resting 12-lead electrocardiogram demonstrating ST-segment elevations in the inferolateral leads.

Discussion

This case series illustrates three patients who were previously well without prior known coronary artery disease, presenting with cardiovascular symptoms, biochemical and electrocardiographic evidence of myocardial injury shortly after the Pfizer-BioNTech COVID-19 vaccine.

From the Pfizer-BioNTech vaccine trials, the outcomes did not report any significant cardiac complications or side effects.[1] The trials demonstrated that the vaccine would generally be well-tolerated with the exception of anaphylaxis in selected individuals.[2,3] The current literature has also not demonstrated any association between COVID-19 vaccines and potential cardiovascular complications.

Nevertheless, these three cases demonstrated myocardial injury with different pathophysiology in close temporal relation to the COVID-19 vaccine. However, it is important to note that, as with all case series, causality cannot be deduced despite the close temporal correlation between the vaccinations and the onset of myocardial injury.

Therefore, these reported events need to be interpreted with caution. Clinicians need to be aware of the wide spectrum of cardiac manifestations that might present after the COVID-19 vaccination. Given that the rolling out of these vaccines has been expedited worldwide, there are very limited data on their adverse outcomes. An international registry would be beneficial to assist in the monitoring of frequency and severity of vaccine-related adverse outcomes.

Conflict of interest. None declared.

References

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