

Reactive Pericarditis Post Meningococcal Vaccine

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ABSTRACT

Background: Allergic autoimmune reaction causing Myopericarditis post vaccine is extremely rare. The patient had received meningococcal vaccine (Groups A, C, W-135 and Y conjugate vaccine oligosaccharides) 5 days prior to the onset of symptoms.

Case summary: We report a case of previously healthy young patient who received Meningococcal vaccine (Meningococcal Groups A, C, W-135 and Y conjugate vaccine), and diagnosed as acute reactive Pericarditis 5 days after vaccination. Treated with Acetylsalicylic acid and colchicine followed by resolution of the cardiac inflammation and subsequent complete recovery. Reviewing the literature, we did not find a similar report.

Conclusion: This case highlights that rare complication, reactive pericarditis, could happen after Meningococcal vaccine like after post Meningococcal infection.

Keywords: Meningococcal

CORE TIP

Patients who have chest complaints after vaccination should be evaluated for the existence of post vaccinal pericarditis and myocarditis, which seems to happen than previously thought. High clinical suspicion, Careful examination and close observation may be required so that an atypical presentation, as well as, manifestations are not overlooked.

INTRODUCTION

Allergic autoimmune reaction causing Myopericarditis post vaccine is extremely rare. The vaccination that has received great attention recently with myocarditis is the smallpox vaccine, [1] Halsell et al. reported probable myopericarditis in 18 cases among 230,734 primary vaccines after smallpox primary vaccination (an incidence of 7.8 per 100,000 over 30 days). No cases of myopericarditis following smallpox vaccination were reported among 95,622 vaccines who were previously vaccinated. A causal relationship is supported by the close temporal clustering (7-19 days; mean, 10.5 days following vaccination) and temporal distribution, occurrence in only primary vaccines, and lack of evidence for alternative etiologies associated with myopericarditis [2].

The meningococci causing primary meningococcal pericarditis (PMP) are usually of serotype C (88% of cases in one series) or, less commonly, serotypes B or W135 [3]. PMP is a purulent pericarditis caused by *N. meningitidis* without initial clinical evidence of meningococcemia, meningitis, and Cardiac tamponade develops in many cases. Evaluation of PMP versus viral pericarditis is important because it usually requires pericardial drainage in addition to antibiotics.

OBJECTIVES

The aim of this case presentation is alert the physician about possibility of reactive pericarditis as an allergic reaction to meningococcal vaccine.

CASE PRESENTATION

Chief complaints

A 22-year-old Saudi male presented to hospital through Emergency department with stiff neck, retrosternal chest pain, aches, fatigue and sudden fever which had taken ibuprofen for symptomatic relief. The patient had no significant medical history.

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History of present illness

The patient gave recent history of meningococcal vaccination (Meningococcal Groups A,C, W-135 and Y conjugate vaccine) 5 days before admission.

History of past illness

No history of smoking, hypertension, diabetes, dyslipidemia or family history of premature coronary artery disease. An infectious review of systems was unremarkable. He has no history of any medications or any medical preparations prior to admission, nor did he use recreational drugs. The patient was born in the Saudi Arabia and his immunization status was up-to-date.

Physical examination

His blood pressure was 130/70 mm Hg, his heart rate was 95 beats/min, his oral temperature was 37.5°C and his oxygen saturation was 100 % on room air. Physical examination revealed a well-developed vaccination site. The patient had diffuse redness and tenderness over the vaccination area. Cardiac examination revealed a normal jugular venous pressure (JVP), a normal apical beat, a normal S1 and S2 without any extra heart sounds, murmurs or rubs.

Table 1: Serial reading of biomarkers of myocarditis over 5 days.

Cardiac markers	1 st day	2 nd day	3 rd day	4 th day	5 th day
Troponin-I (ug/L) *	16	9.90	6.46	4.16	0.02
Mass CK-MB (ug/L)	30	25	16	2.5	1.3
NT-pro BNP (pig/ml)	~	2107	1576	364	100
CRP (mg/L)	90	135	103	55	13
ESR (mm/h)	34	74	80	44	7
AST (U/L)	100	~	44	25	~
LDH (U/L)	387	414	356	324	200

NT-pro BNP: N-terminal prohormone of brain natriuretic peptide.
 CRP: C Reactive Protein
 ESR: Erythrocyte Sedimentation Rate
 AST: Aspartate Amino Transferase.
 LDH: Lactate Dehydrogenase.
 Normal Troponin level up to 0.04 ug/l

Laboratory examinations

Extensive evaluation of laboratory results found normal levels of Lymphocytes, Monocytes, and Eosinophils in deferential White cells count. Other lab results showed Troponin, Aspartate

aminotransferase (AST), Lactate dehydrogenase (LDH), Brain – Natriuretic peptide (BNP), erythrocyte sedimentation rate (ESR) and C- reactive protein (CRP) were significantly elevated. (Table 1) shows serial reading over 5 days.

The results of virus studies investigating other possible causes of myopericarditis were negative for HIV and hepatitis viruses. The results of blood and urine cultures were negative. Stool cultures were negative for enteroviruses. Serum electrolyte levels and findings of chest radiography were normal.

Imaging examinations

The findings of an initial electrocardiogram (ECG) demonstrated diffuse concave upward ST-Segment elevation on limb leads II, III, aVF, and chest leads V3, V4, V5, V6 (Figure 1), with PR segment elevation in lead aVR. An echocardiogram performed on admission revealed normal biventricular systolic function without regional wall motion abnormalities and trivial pericardial effusion and CT coronary angiography revealed normal coronaries.

Final diagnosis

The diagnosis of pericarditis was made on consideration of his fever, recent immunization and absence of risk factors for coronary artery disease with positive ECG changes and elevated cardiac markers.

Treatment and hospital course

The patient was admitted to the cardiac intensive care unit for observation and monitoring. A regimen of 600 mg of Acetylsalicylic acid, taken orally every 6 h, Colchicine 0.5 mg was administered twice daily and pantoprazole 40 mg once daily was initiated for gastric protection. The patient showed dramatic clinical improvement 4 days following therapy with normalization of inflammatory and cardiac markers. The findings of an echocardiogram performed 1 week after discharge were normal.

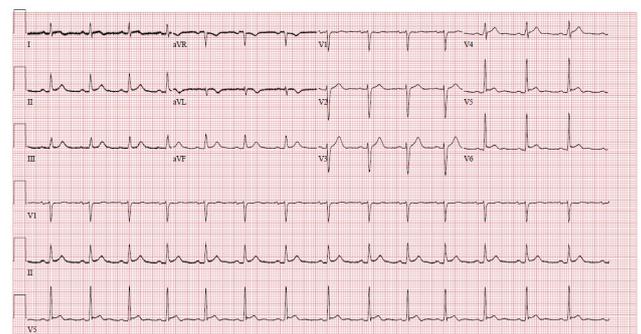


Figure 1: (ECG) demonstrated diffuse concave upward ST-Segment elevation on limb leads II, III, aVF, and chest leads V3,V4, V5, V6 with PR segment elevation in lead aVR.

Outcome and follow-up

After 5 days of treatment and at follow-up visits, for one month, the patient was asymptomatic, and has uneventful clinical course.

DISCUSSION

Perimyocarditis is an acute inflammation of the pericardium and the underlining myocardium resulting in myocellular damage. It can be considered as acute pericarditis with elevated cardiac

biomarkers. Although cardiac biomarkers were elevated in our patient, his echocardiography showed normal myocardium with normal wall motion.

Table 2: Previous cases of reactive meningococcal pericarditis in literature.

Author/Reference	Patient age/y	Time pericarditis diagnosis	of <i>Neisseria meningitidis</i> serogroup	Clinical presentation	Therapy
Chiappini [5]	10	7 d	C	Meningitis	Prednisone + Aspirin
El-Bashir [6]	13	7 d	C	Meningitis	Dexamethasone + Ibuprofen, later diclofenac sodium
Dupont [7]	14	3 d	C	Meningitis	ASA
Stephani [8]	14	9 d	C	Meningitis, endophthalmitis	Prednisone + Antibiotics
Fuglsang Hansen [9]	No data	11 d	No data	Meningitis	Steroid + Pericardiocentesis
Akinosoglou K [10]	28	No data	B	Meningococemia and acute abdominal pain	Steroid + Antibiotics

Reported cases of meningococcal reactive pericarditis in global literature.

Y: Years D: Days; CSF: Cerebrospinal Fluid; ASA: Acetylsalicylic Acid; NSAID: Non Steroid Anti Inflammatory Drug.

^aLimited data due to language constrains (Danish and German).

Primary meningococcal pericarditis (PMP) is a rare form and usually presented as acute purulent pericarditis that usually complicated by cardiac tamponade and usually requires pericardial drainage. PMP is typically caused by *Neisseria meningitidis* of serotype C, or, less commonly, B or W135. In general, meningococcal myopericarditis is categorized into three etiologies; primary meningococcal disease, secondary disease due to disseminated meningococemia, and reactive meningococcal pericarditis (RMP) form as an immunologic complication [4]. Because of previous negative history of infection, the exposure to meningococcal vaccine (Groups A, C, W-135 and Y conjugate vaccine oligosaccharides) 5 days prior to the onset of symptoms, clinical improvement later on and negative serology for infectious and autoimmune diseases we decided that pericarditis was reactive rather than a result of direct infection of the myocardium, and a combination of Acetyl Salicylic acid and colchicine, respectively, was initiated.

Many previous case reports of RMP were recorded after meningococcal infection but no cases were recorded after meningococcal vaccination. RMP is a rare condition and may be more severe than purulent pericarditis and cardiac tamponade can be relatively frequent requiring high dosages of steroids and/or pericardiocentesis. It develops most frequently 6–15 days after onset of illness and is characterized by type 3 hypersensitivity reactions, either against the specific serotype of the *N. meningitidis* or newly antigenic, damaged pericardial

tissue because of molecular mimicry with microbial antigens. Contrary to purulent pericarditis, RMP represents a late complication and there are many reported cases of meningococcal reactive myopericarditis post meningococcal infection in global literature since 1969 (Table 2) [5-10]. Severe disease, age (adults and young teenagers), and serogroup C seems to predispose to post-infectious immune associated complications including arthritis, vasculitis, pleuritis, or pericarditis [7-9]. The vaccination that has received great attention recently with myocarditis is the smallpox vaccine [1]. There is 1 reported case of myocarditis that developed hours after diphtheriatetanus-acellular pertussis (DTaP) vaccination in a 3-month-old, and another case of myocarditis after tetanus vaccination alone in a 14-year-old [11,12].

In line with these observations, our patient was a young adult, presenting in poor clinical condition, with highly elevated inflammatory markers suggestive of severe disease and patient was responsive to anti-inflammatory drugs without antibiotics. We considered the diagnosis of reactive pericarditis rather than myopericarditis due to his normal echocardiography and smooth course of management.

CONCLUSION

Patients who have chest complaints after vaccination should be evaluated for post vaccine pericarditis and myocarditis. High

clinical suspicion, Careful examination and close observation may be required so that an atypical presentation, as well as, manifestations is not overlooked. Endomyocardial biopsy specimens might help to determine the relative roles of vaccine insult to the myocardium. Our patient's mild illness, uncomplicated course, and good response to treatment deferred the need for biopsy.

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