

False Positive Troponin Levels due to Heterophil Antibodies in a Pregnant Woman

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SUMMARY

Positive troponin test results in peripheral blood can be detected either during myocardial injury or from falsely positive test results. In this report, we present the positive results of a troponin test in a 24-year-old pregnant woman referred to the emergency department with atypical chest pain, and the clinical algorithm that we used to make the correct diagnosis. This patient presented with the same complaint of chest pain at different times while positive troponin levels were detected. In the absence of signs of myocardial injury, we suspected that heterophil antibodies were playing a major role. Further examinations revealed heterophil antibodies that could cross react with the troponin tests in peripheral blood.

Key words: False positive troponin; heterophil antibodies.

Introduction

As a result of myocardial infarction, enzymes such as myoglobin, cardiac troponins, creatine kinase, and lactate dehydrogenase rise in the blood. Among these, cardiac troponins play a special role by virtue of their characteristics of being released only from cardiac muscle; increased levels even in minor myocardial injury retain the ability to make a diagnosis with high sensitivity and accuracy. As a result, European and American societies of cardiology have recommended the use of troponin I or T as a diagnostic laboratory criterion of myocardial infarction since 2000.^[1] Elevated level of troponin indicates myocardial injury in spite of no information about the cause of the injury.

Apart from myocardial infarction, positive troponin level may also be detected due to myocardial injury or false positive test results.^[2,3] In this report, we aimed to present a case with troponin positivity due to heterophil antibodies.

Case Report

A 24-year-old housewife referred to the emergency department with left submammary chest pain that was confined to a point and increased with leaning forward or deep breathing (November 14th). Due to a positive troponin level she was transferred to the cardiology polyclinic (troponin-I level: 0.20 ng/mL, reference level: 0-0.04 ng/ml) (Table 1).

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Her medical history was remarkable for being 20 weeks pregnant. She had no history of heart disease, medication use, cigarette smoking, alcohol, or drug abuse. Functionally, she was in a good status. Her physical examination was unremarkable. Both electrocardiography and echocardiography were negative with respect to perimyocarditis, myocardial ischemia, or myocardial infarction. Other blood tests were normal for creatine kinase (CK), creatine kinase MB isoenzyme (CK-MB), and alkaline phosphatase or rheumatoid factor (Table 2) with false positive potential in result of troponin level. As she revealed she had similar complaints before pregnancy with positive troponin levels (Table 1). In the absence of typical myocardial ischemia, which was not confirmed by electrocardiography, echocardiography or normal range result of the CK and the CK-MB despite troponin-I elevation, we concluded the possibility of laboratory error that resulted in a false positive troponin elevation. For increased accuracy of the test result we surveyed the

result in two different laboratories simultaneously (November 15th). The obtained laboratory results showed positive troponin-I levels in our center with normal troponin-T levels in another center. When the same sample was studied using the interference test at our laboratory, the troponin-I level was found within the normal range. The false positivity was attributed to interference of heterophil antibodies and her blood sample was sent to a tertiary center to search for heterophil antibodies.

Discussion

Cardiac troponins are sensitive and specific laboratory markers for myocardial injury and thus replaced CK-MB, the conventional diagnostic marker. Troponins are currently considered the gold standard for the diagnosis of acute myocardial infarction.^[1,4] Depending on the cellular damage, cardiac troponins begin to emerge in plasma 4-6 hours after the onset

Table 1. Patient's troponin levels during eight months

Date-Hour	Troponin-I (reference)	CK (reference)	CK-MB (reference)	Troponin-T (reference)	Studying laboratory
April 4th 01:59 p.m.(*)	0.20 (0-0.04 ng/ml)				Our laboratory
April 4th 04:42 p.m.	0.21 (0-0.04 ng/ml)				Our laboratory
April 4th 10:12 p.m.				<0.01µg/L (<0.01µg/L)	1st outside center
November 14th 08:11 p.m.(#)	0.20 (0-0.04 ng/ml)		11 (0-25 u/l)		Our laboratory
November 15th 00:56 a.m.(#)	0.20 (0-0.04 ng/ml)				Our laboratory
November 15th 09:56 a.m.	0.24 (0-0.04 ng/ml)	46 (0-145 u/l)	10 (0-25 u/l)		Our laboratory
November 15th 12:23 p.m.				<0.01µg/L (<0.01µg/L)	2nd outside center
November 20th 03:28 p.m.(#)	0.20 (0-0.04 ng/ml)	53 (0-145 u/l)	11 (0-25 u/l)		Our laboratory

(*): Blood results before pregnancy. (#): Blood results during pregnancy.

Table 2. Other blood results from the patient

Date	WBC (reference)	RBC (reference)	HGB (reference)	HTC (reference)	PLT (reference)	CRP (reference)	ALP (reference)	AST (reference)	RF (reference)
November 20th	7.4 x10 ⁹ L (4-12x10 ⁹ L)	4.05 x10 ¹² L (3.5-5.2 x10 ¹² L)	12.1 g/dL (12-16 g/dL)	35.9% (35-49%)	230 x10 ⁹ L (130-450x10 ⁹ L)	4 mg/dl (0-5 mg/dl)	52.39 U/L (30-120 U/L)	19 u/l (0-31 u/l)	4 IU/L (0-18 IU/L)

WBC: White Blood Count; RBC: Red Blood Cells; HGB: Hemoglobin; HTC: Hematocrit; PLT: Platelet; CRP: C-reactive protein; ALP: Alkaline Phosphatase; AST: Aspartate Transaminase; RF: Rheumatoid Factor.

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