CASE REPORT

Two cases of inflammatory muscle disease presenting with raised serum concentrations of troponin T

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Troponins T and I are highly sensitive markers of myocardial injury. However, non-cardiac disorders, such as pulmonary embolism, renal failure, subarachnoid haemorrhage, sepsis, eclampsia, chemotherapy, and inflammatory muscle conditions (dermatomyositis and polymyositis), can also result in raised serum troponin concentrations. This article describes two cases that occurred within a month of each other in Craigavon Area Hospital, whereby conditions unrelated to myocardial ischaemia resulted in raised concentrations of cardiac markers. The first patient, in retrospect, underwent unnecessary investigation as an inpatient in the cardiac ward. Experience gained from this case led to more appropriate consultation and management of the second patient.

Troponin T is a sensitive marker of ischaemia induced myocardial damage. However, despite its excellent specificity, there are increasing numbers of both non-ischaemic cardiac and non-cardiac conditions associated with raised concentrations.† We present two case reports of patients with inflammatory muscle disease where the possible diagnosis of acute myocardial infarction arose. These patients were treated in very different ways. In our review of the literature pertaining to the causes of raised troponin concentrations, there was little reference to inflammatory muscle disease. Indeed, most lists of causes of raised troponin concentrations do not include this possibility.†

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CASE REPORTS

Patient 1

Patient 1 was a 58 year old woman with type 2 diabetes mellitus (treated with insulin), polymyositis, and hypertension. Medications were as follows: Humalog Mix25, 42 units a.m., 4 units p.m.; mycophenolate mofetil (Cellcept), 500 mg twice daily; prednisolone, 5 mg daily; sodium alendronate, 70 mg weekly; lisinopril, 5 mg daily; folic acid, 0.4 mg daily; and Adcal-D3. She had good glycaemic control (glycated haemoglobin, 7.0%) and no history of cardiovascular disease.

Her family doctor requested a creatine kinase (CK) activity measurement because she had been complaining of increased muscular aches and weakness. She had experienced no chest discomfort or other symptoms suggestive of coronary heart disease. Total CK was raised at 615 U/litre (Roche Diagnostics, Mannheim, Germany; reference interval, 1–195; intra-assay coefficient of variation (CV), 0.6%). CK-MB (MB isoenzyme) was also raised at 53 U/litre (Roche Diagnostics immunoinhibition assay; reference interval, 1.0–25.0; intra-assay CV, 3.8%), with a %CK-MB/total CK of 8.6%. According to the laboratory protocol, a request for serum troponin T concentration (Roche Diagnostics; intra-assay CV, 2.3% at 0.2 μg/litre) was automatically generated and was found to be raised at 0.174 μg/litre (troponin T > 0.1 μg/litre is consistent with myocardial damage).

The biomedical scientist telephoned these results to the patient’s family doctor as is standard protocol. The patient was admitted to the cardiac ward for further investigations. Subsequently, her electrocardiogram was normal and an exercise stress test showed no evidence of myocardial ischaemia; echocardiography was also normal. The troponin T concentration remained raised 48 hours later, at 0.158 μg/litre. The results were discussed with the consultant chemical pathologist, who noted several reports in the literature describing raised concentrations of cardiac markers, including troponin T, in patients with inflammatory muscle disease.‡ This patient’s raised CK-MB and troponin T were therefore explained on the basis of her active polymyositis.

Patient 2 (four weeks later)

Patient 2 was a 38 year old woman with dermatomyositis attending the dermatology outpatient department; she was treated with both prednisolone and azathioprine. She complained of a two week history of increased muscular symptoms; total CK was 3642 U/litre, CK-MB was 937 U/litre, and %CK-MB/total CK was 25.7%. As in the previous case, the troponin T concentration was measured according to laboratory protocol and was raised at 3.12 μg/litre. In this case, the consultant chemical pathologist was notified of the results by the laboratory staff and the case was discussed with the consultant dermatologist; he felt that the patient was unlikely to have ischaemic heart disease or to have suffered a myocardial infarction. She had experienced no chest pains and an electrocardiogram was normal. The increased troponin T and CK-MB were believed to be secondary to active dermatomyositis. Two weeks later, the patient’s total CK was 1840 U/litre, CK-MB was 458 U/litre, %CK-MB/total CK was 24.9%, and the troponin T concentration remained raised at 2.9 μg/litre. An echocardiogram performed several weeks later revealed mild left ventricular hypertrophy, mild dilatation of the left ventricle, and a trace of mitral regurgitation. The ejection fraction was normal at 65%.

DISCUSSION

The measurement of troponins (T and I) has largely superseded CK/CK-MB analysis, and is thought to provide more sensitive and specific data for use in the diagnosis and monitoring of cardiac disease. However, troponin concentrations are raised by a number of non-ischaemic conditions, including passive congestion secondary to cardiovascular disease or pulmonary embolism, renal failure, subarachnoid haemorrhage, sepsis, and inflammatory muscle conditions. The measurement of troponins (T and I) has largely superseded CK/CK-MB analysis, and is thought to provide more sensitive and specific data for use in the diagnosis and monitoring of cardiac disease.

Abbreviations: CK, creatine kinase; CV, coefficient of variation; MB, MB isoenzyme
Take home messages

- We describe two patients with raised concentrations of cardiac markers (creatine kinase MB isoenzyme and troponin T) in the absence of acute myocardial damage, caused by inflammatory muscular disease.
- The exact source of the raised cardiac markers is unclear and could indicate myocardial involvement by the inflammatory process or a non-cardiac (probable skeletal muscle) source.
- Thus, it is important to consider inflammatory muscle disease as a cause of increased troponin T in the absence of clinical evidence of an acute coronary ischaemic event.

muscle disease (polymyositis and dermatomyositis) is an important cause of increased cardiac markers (CK-MB and troponins).2–4; these are raised in up to 75% of patients.11 Our laboratory protocol of measuring troponin T concentrations automatically when CK-MB is raised contributed to the problem; in the future, this will not be done unless specifically requested by the patient’s attending clinician.

In conclusion, we have described two case reports of patients suffering from inflammatory muscle disease with raised concentrations of cardiac markers (CK-MB and troponin T) in the absence of acute myocardial damage. The increased CK-MB and troponin T concentrations were caused by inflammatory muscular disease. However, we cannot be sure of the exact source of the raised cardiac markers; they could indicate myocardial involvement by the inflammatory process or a non-cardiac (probable skeletal muscle) source. The experience gained from the diagnosis and management of the first patient was invaluable when the second patient presented.

These cases outline the importance of considering inflammatory muscle disease as a cause of increased troponin T, in the absence of clinical evidence of an acute coronary ischaemic event. Troponin concentrations must be interpreted in their clinical context. They also highlight the role of the clinical biochemistry laboratory in the education of clinical colleagues regarding the appropriate use of troponin assays and the interpretation of results.

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