

Fatal intrathoracic haemorrhage after cardiopulmonary resuscitation and treatment with streptokinase and heparin

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SUMMARY A 66 year old man with acute myocardial infarction underwent cardiopulmonary resuscitation before being treated with streptokinase and heparin. Seventeen hours later he died of an intrathoracic haemorrhage caused by multiple fractures of the sternum and ribs.

Case report

A 66 year old man with no previous medical history collapsed 20 minutes after the sudden onset of retrosternal chest pain. Within ten minutes the medical team arrived and started cardiopulmonary resuscitation. The patient was intubated and defibrillated three times because of ventricular fibrillation. Adrenaline was given twice for asystole. Cardiac rhythm converted to a stable accelerated nodal rhythm and the patient was taken to hospital.

The electrocardiogram on admission showed nodal rhythm, no Q waves, and 3-5 mm ST segment elevation in leads corresponding to the inferolateral wall (I, II, III, aVF, V5, and V6). The patient was regarded as a candidate for streptokinase treatment because of the short history (two hours after onset of symptoms) and the absence of absolute contraindications. 1.5 million IU streptokinase was given over 30 minutes followed by heparin infusion (10 000 IU as a bolus injection and 15 000 IU over 24 hours).

No other agents that are associated with bleeding complications (such as antiplatelet drugs) were given to the patient.

Initially, treatment seemed to be effective. An electrocardiogram taken 6-7 hours after admission was almost normal, with no Q waves. Cardiac enzymes were measured three and 11½ hours after onset of symptoms. Total creatine kinase was 1375 and 4860 U/l, creatine kinase B 76 and 180 U/l, and aspartate aminotransferase 104 and 310 U/l respectively.

The patient became hypotensive 12½ hours after admission. Shock developed and he died 4½ hours

later. The clinical diagnosis was cardiogenic shock caused by myocardial failure.

Necropsy showed a massive intrathoracic retrosternal haemorrhage. The left thoracic cavity contained 1200 ml blood and the right 600 ml. The necropsy results indicated that the source of haemorrhage was fracture of the sternum and fractures of the ribs (3rd, 4th, and 5th rib on the right side and 3rd and 4th rib on the left side) which were caused by external cardiac massage. There were no signs of cardiac or pulmonary laceration. The cause of death was hypovolaemic shock.

Discussion

Intravenous streptokinase is increasingly used to treat acute myocardial infarction. Intravenous thrombolysis is effective in 50-60% of patients,¹ but it is not without risks or side effects. Relative contraindications include recent external cardiac massage.^{2,3}

To our knowledge there have been no reports of fatal haemorrhage from fractures of the sternum or ribs or both after thrombolytic treatment with streptokinase and heparin. The most severe and common haemorrhages are gastrointestinal and intracranial.³

External cardiac massage is estimated to cause sternal or rib fractures in 30-45% of patients.^{4,5}

The rib fractures could have been solely responsible for the fatal bleeding. It seems likely, however, that the addition of streptokinase caused this massive bleeding. Heparin was also given to this patient and others have concluded that streptokinase and heparin given simultaneously may increase the risk of haemorrhage.⁶

This case highlights a risk of thrombolytic treatment in patients who have undergone cardiopulmon-

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ary resuscitation. We believe that recent external cardiac massage is a relative contraindication for thrombolytic treatment and that the benefit-risk ratio must be carefully considered in patients who have had external cardiac massage.

References

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