

Società Italiana Medicina d'Emergenza – Urgenza Sezione Regionale Ligure

Società scientifica dei Medici d'Urgenza, Pronto Soccorso ed Emergenza Territoriale

Up-to-date in tema di infarto miocardico acuto

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Criteria for myocardial injury

Detection of an elevated cTn value above the 99th percentile URL is defined as myocardial injury. The injury is considered acute if there is a rise and/or fall of cTn values.

Definition of Myocardial Infarction

Pathology

Acute myocardial infarction is defined as myocardial cell death due to prolonged myocardial ischemia.



Clinical criteria for MI

The clinical definition of MI denotes the presence of acute myocardial injury detected by abnormal cardiac biomarkers in the setting of evidence of acute myocardial ischaemia.





Criteria for type 1 MI

Detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL and with at least one of the following:

- Symptoms of acute myocardial ischaemia;
- New ischaemic ECG changes;
- Development of pathological Q waves;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology;
- Identification of a coronary thrombus by angiography including intracoronary imaging or by autopsy.^a

Myocardial Infarction Type 2





Atherosclerosis and oxygen supply/demand imbalance



Vasospasm or coronary microvascular dysfunction



Non-atherosclerotic coronary dissection



Oxygen supply/demand imbalance alone

Criteria for type 2 MI

Detection of a rise and/or fall of cTn values with at least one value above the 99th percentile URL, and evidence of an imbalance between myocardial oxygen supply and demand unrelated to coronary thrombosis, requiring at least one of the following:

- Symptoms of acute myocardial ischaemia;
- New ischaemic ECG changes;
- Development of pathological Q waves;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology.



Criteria for type 3 MI

Patients who suffer cardiac death, with symptoms suggestive of myocardial ischaemia accompanied by presumed new ischaemic ECG changes or ventricular fibrillation, but die before blood samples for biomarkers can be obtained, or before increases in cardiac biomarkers can be identified, or MI is detected by autopsy examination.

Biomarkers for Detection of Myocardial Infarction



• Preferably

 Detection of rise and/or fall of cardiac Troponin (I or T) with at least one value above the 99th percentile of the upper reference limit measured with a coefficient of variation ≤ 10%.



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Review

Contemporary Emergency Department Management of Patients with Chest Pain: A Concise Review and Guide for the High-Sensitivity Troponin Era

James E. Andruchow, MD, MSc, FRCPC-EM, ABEM,^{a,b} Peter A. Kavsak, PhD, FCACB, FCCS,^c and Andrew D. McRae, MD, PhD, FRCPC-EM^{a,b}



Elevations of Cardiac Troponin Values because of Myocardial Injury

Injury related to primary myocardial ischaemia	Injury not related to myocardial is chaemia
 Plaque rupture. Intraluminal coronary artery thrombus formation. Injury related to supply/demand imbalance of 	 Cardiac contusion, surgery, ablation, pacing, or defibrillator shocks. Rhabdomyolysis with cardiac involvement. Myocarditis
myocardial ischaemia	 Cardiotoxic agents, e.g. anthracyclines, herceptin.
 Tachy-/brady-arrhythmias. 	Multifactorial or indeterminate myocardial injury
 Aortic dissection or severe aortic valve disease. 	• Heart failure.
 Hypertrophic cardiomyopathy. Cardiogenic hypovolaemic or sentic shock 	 Stress (Takotsubo) cardiomyopathy.
 Severe respiratory failure. 	Severe pulmonary embolism or pulmonary
 Severe anaemia. 	Sepsis and critically ill patients
 Hypertension with or without LVH. 	Renal failure.
 Coronary spasm. 	• Severe acute neurological diseases, e.g. stroke,
 Coronary embolism or vasculitis. 	subarachnoid haemorrhage.
 Coronary endothelial dysfunction without 	 Infiltrative diseases, e.g. amyloidosis, sarcoidosis.
significant CAD.	Strenuous exercise.

tropomania

The <u>compulsion</u> of ordering troponins in all patients regardless of their <u>clinical</u> presentation or <u>chief</u> complaint.

That <u>patient</u> came with a <u>headache</u> and this <u>doctor</u> ordered troponins. Clearly this doctor suffers from tropomania.







- ST sopra in aVR o V1+ ST sotto >=1mm in 6 derivazioni: coronaropatia critica multivasale o tronco comune
- SGARBOSSA





REINFARTO

- Termine usato per un MI acuto che si verifica entro 28 gg da un infarto precedente
- ECG : ST elevato>=1 mm o nuova onda Q in due derivazioni contigue
- hs-cTn all'arrivo e 3-6h dopo : se positiva all'arrivo ci deve essere un delta >20%, mentre se la prima è normale valgono i soliti criteri

TAKOTSUBO



TAKOTSUBO

- 1-2% dei pazienti con sospetto STEMI
- trigger: intento stress emotivo/fisico, 90% donne post menopausa
- mortalità simile a STEMI 4-5%
- ECG: ST sopra (44%casi) precordiali e laterali, ST sotto (<10%) dopo 12-24h, T simmetriche e profonde con QTc allungato
- hs-cTn modesta elavazione nel 95% dei casi, in contrasto che le alterazioni diffuse ECG e della cinesi
- eco: alterazioni della cinesi VS apicali (82%) medio (14,6) basali (2,2%)
- angiografia: coronarie normali o con stenosi non sufficienti a spiegare il quadro clinico

TAKOTSUBO VS MI

- QTc allungato >500ms durante la fase acuta
- recupero della funzionalità del VS oltre le 2-4 settimane



Myocardial Infarction with Non-Obstructive Coronary Arteries





MINOCA

Key Points

Diagnostic criteria	 Acute Myocardial Infarction: Universal criteria Coronary angiography: Non Obstructive arteries (<50% stenosis) No overt cause for presentation evident at angiography
Prevalence	• 10-15% of all acute myocardial infarct presentations
Risk factors	• Younger age, Female gender
Etiology	 Coronary causes Vasospastic Angina (epicardial artery spasm) Coronary Microvascular Disorders - Coronary slow flow, Microvascular angina, Microvascular spasm Coronary Plaque Disruption Spontaneous coronary thrombosis/embolism Missed Obstructive Coronary Artery Disease (CAD) Non coronary causes Myocarditis Takotsubo & other cardiomyopathies Non cardiac troponin elevation
Diagnostic tools	 Cardiac magnetic resonance (CMR) imaging is a key investigation in identifying the underlying cause. Also consider D-dimer, coronary spasm provocation testing and thrombophilia screening.
Prognosis	 5% all cause mortality at 12 months 25% angina recurrence at 12 months
Management	• Use of statins, Angiotensin-converting-enzyme (ACE) inhibitor /angiotensin receptor blockers (ARB) may reduce major adverse cardiac events.

MISCELLANEA

- insufficienza renale
- paziente critico
- fibrillazione atriale

The most dangerous phrase in the language is

"We've always done it this way."

-Grace Hopper-

"Per me,una persona eccezionale è quella che si interroga sempre, laddove gli altri vanno avanti come pecore..." (Fabrizio De André)