

- 1- myoglobin is more sensitive than CK , CK-MB activity
- 2- if patient is admitted after (10-12) hours or more from chest pain → don't use myoglobin (it reaches peak at 6-9 hours then start to decline )
- 3- if myoglobin is normal around 8 hours from chest pain → there is no MI
- 4- CK-MB is more specific than myoglobin but less specific than cardiac troponin I
- 5- CK-MB isn't myocardial specific , it's considered acceptable only in cases where cardiac troponin assays are not available
- 6- primary hepatic dysfunction → increases plasma AST but LDH still normal
- 7- don't use AST & LDH → they're not specific (both are low valuable and no more use)
- 8- only benefit of LDH → if patient is admitted late after his chest pain , LDH may be useful as it remains elevated for several days ( 5-6 days)
- 9- Troponin C isn't cardiac specific
- 10- Troponin T can be raised in chronic renal failure ( not specific )
- 11- troponin I is heart specific → for delayed admitted cases ( remains for a week )
- 12- healthy people have CK-MB normally in plasma but their levels are elevated after MI , however , they don't have troponins normally and they appear after MI

## **CARDIAC TROPONIN: TROPONIN I (CTN I)**

- SERUM TROPONINS ARE **NOT FOUND IN HEALTHY INDIVIDUALS** (UNLIKE CK/MB).
- TROPONINS ARE BOTH **MORE SENSITIVE** (DIAGNOSE MINOR INFARCTION) AND **MORE SPECIFIC** THAN CK-MB IN TERMS OF ITS DIAGNOSTIC ABILITY WITH RESPECT TO MYOCARDIAL DAMAGE.
- **PROGNOSTIC MARKER** (RELATION BETWEEN LEVEL IN BLOOD & EXTENT OF CARDIAC DAMAGE). DETERMINATION OF SIZE OF INFARCT.
- DETERMINATION OF **SUCCESS OF REPERFUSION.**
- **TWO NEGATIVE TROPONINS 6 HOURS APART** ARE GOOD (BUT NOT ABSOLUTE) EVIDENCE OF NO RECENT AMI.
- **ELEVATED TROPONIN** LEVELS IN PATIENTS **WITHOUT ECG** CHANGES & WITH **NORMAL CK-MB** LEVELS MAY IDENTIFY PATIENTS **AT INCREASED RISK OF CARDIAC EVENTS**

**\*\*NOTE :** all these biomarkers are new and still under experiments to be used in the future or not

**13-** Isoenzyme BB Glycogen Phosphorylase can detect **ischemia** , MI , unstable angina and it's very sensitive ( >> sensitive than CTNT , ,myoglobin , CK-MB )

**14-** Copeptin is C-terminal of provasopressin

**15- Copeptin & CTNI can rule out of MI**

**16-** Ischemia Modified Albumin → can detect **ischemia** , not specific but sensitive to ischemia >>> MI

**17-** micro-RNAs : high specificity and sensitivity

MIR-1 , MIR-133 , MIR-499 → elevated in MI ( MIR-499 has slow elevated levels so it's useful in late diagnosis )

MIR-208 → for normal people it was absent , but after occurrence of AMI it has been elevated in 100% of the cases even that CTNI has been elevated only in 85% of them

MIR-122 , MIR-375 → drop after MI

Biomarkers useful for testing **re-infarction** → CK-MB

Biomarkers useful for detecting MI if patient comes **late** → CTNT , MIR-499(still under experiments) , LDH (only benefit and may be used )