

Improved efficiency and cost reduction in the emergency department by replacing contemporary sensitive with high-sensitivity cardiac troponin immunoassay

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To the Editor,

Aloe and coll. planned this study to evaluate the impact of replacing a contemporary-sensitive with HS cTnI immunoassay on hospital and laboratory workload.

The authors say that, 'Despite some evidence, the clinicians are still hesitant to replace the former so-called contemporary-sensitive methods with HS-cTn techniques, justifying this reluctance with concerns of overutilization, possible over diagnosis of cardiac injuries, overcrowding of emergency departments (EDs), and excess of cardiac invasive testing.

Several factors have lead clinicians to use terms such as "troponin leak", "false-positive" troponin elevation, or "troponinemia".

The Authors report that although the total emergency department (ED) visits modestly increased after introducing HS-cTnI, the number of total cTnI tests declined by over 10%. A substantial reduction of single-sample test requests was noted, accompanied by a considerable decline of 3- and 4-sample collections (i.e., -61% and -73%, respectively). A high percentage of patients (27.5%) displayed HS-cTnI values <LoD at admission, thus allowing safe discharge...

The results of this study show substantial organizational and economic benefits by replacing contemporary-sensitive with HS cTnI immunoassays. This is a very important question because there are some areas such as acute non-ST elevation coronary syndromes (NSTEMI) and in elderly patients, the specificity is very low for the simultaneous presence of factors that can alter the dosage of HS-cTnI values.

For example, Non-ACS causes could be either non-ACS ischemic causes or non-ACS non-ischemic causes (1). The non-ACS ischemic causes include tachyarrhythmias, myocardial hypoxia, severe anaemia, or gastrointestinal bleeding (1).

Non-ACS demand-ischemic conditions like anaemia may cause troponin elevation (Type 2 MI) (1).

Non-ACS non ischemic causes include heart failure, pulmonary embolism, chronic kidney disease, stress/septic cardiomyopathy, myocarditis, drug-induced cardiomyopathy, amyloidosis, following no cardiac surgery, blunt chest trauma, and subarachnoid haemorrhage (1). In addition, false-positive test results are known with immunoassays secondary to the presence of heterophilic antibodies or human autoantibodies even though most assays contain blocking antibodies to avoid these interferences (2). Another field of possible false positive rate of high-sensitivity troponin assay is the myocardial infarction in elderly. As report Tushar Acharya and coll. (3), in patients, mean age was 76.6 ± 5.6 years with 42.7% males, abnormal hs-cTnI were found in 7.9% of males and 8.1% of females. Age and abnormal renal function were the two strongest independent predictors of elevated hs-cTnI. These age-agnostic thresholds could cause a drastic initial overestimation of MI in the elderly.

Conclusions

Hs-cTnI is widely used in Italy and other countries. The availability of newer generation hs-cTnI, hs-cTnI

has increased the sensitivity of diagnosing non-ST-elevation ACS but at the cost of a reduced ACS specificity and of an unnecessary admissions and interventions.

Conflict of Interest: The author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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