Cardio Mag

Volume 1|Issue 19|2020

Dear Doctor,
*Greetings from Micro Labs Limited. We are happy to bring you "**Cardio Mag**", which contains latest and interesting news in the field of Cardiology.*

This issue contains

- ***Fluorine-18 Flurpiridaz Positron Emission Tomography for Evaluation of Coronary Artery Disease.***
- ***False-positive troponin elevation –A case report.***
- ***A novel platform for remote patient monitoring.***

Should you require any specific article or medical information, please feel free to contact us at ***medicalservices@microlabs.in***

Looking forward to your valuable feedback.
Best Regards,
Medical Team, Micro Labs Limited

1. Fluorine-18 Flurpiridaz Positron Emission Tomography for Evaluation of Coronary Artery Disease.

Fluorine-18 flurpiridaz is a novel positron emission tomography (PET) myocardial perfusion imaging tracer.

Aim of the study was to evaluate the diagnostic efficacy and safety of flurpiridaz PET versus technetium-99m–labelled single photon emission computed tomography SPECT for the detection and evaluation of coronary artery disease (CAD), defined as ≥50% stenosis by quantitative invasive coronary angiography (ICA). Flurpiridaz safety was also evaluated.

Methods:

A prospective multicenter phase III prospective clinical study, 800 patients with known or suspected CAD were enrolled.

800 patients were evaluated, and the mean age was 62.3 ±9.5 years, 31% were women, 55% had body mass index ≥30 kg/m2, and 71% had pharmacological stress.

Patients underwent 1-day rest-stress (pharmacological or exercise) flurpiridaz PET and 1- or 2 day

Cardio Mag
Volume 1|Issue 19|2020

rest-stress , Tc-99m–labeled SPECT and ICA. Images were read by 3 experts blinded to clinical and ICA data.

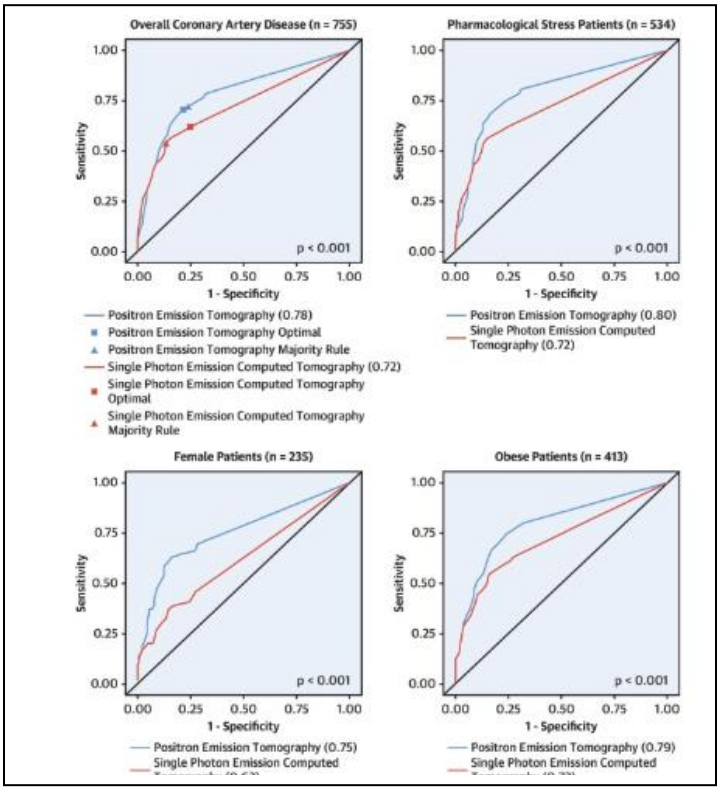
Results:

Flurpiridaz PET Sensitivity (for detection of ≥50% stenosis by ICA) was 71.9% (95% confidence interval [CI]: 67.0% to 76.3%), significantly ($p < 0.001$) higher than SPECT (53.7% [95% CI: 48.5% to 58.8%]), while specificity did not meet the prespecified noninferiority criterion (76.2% [95% CI: 71.8% to 80.1%] vs. 86.6% [95% CI: 83.2% to 89.8%]; p = NS).

Receiver-operating characteristic curve analysis demonstrated superior discrimination of CAD by flurpiridaz PET versus SPECT in the overall population, in women, obese patients, and patients undergoing pharmacological stress testing ($p < 0.001$ for all).

Flurpiridaz PET was superior to SPECT for defect size ($p < 0.001$), image quality ($p < 0.001$), diagnostic certainty ($p < 0.001$), and radiation exposure (6.1 ±0.4 mSv vs. 13.4 ±3.2 mSv; $p < 0.001$).

Flurpiridaz PET was safe and well tolerated.



Discussion:

Flurpiridaz F 18 is an investigational positron emission tomography (PET) myocardial perfusion imaging (MPI) agent that may help better evaluate coronary artery disease (CAD).

A fluorine 18-labeled agent that binds to mitochondrial complex 1 (MC-1), flurpiridaz F 18 is designed for use in PET MPI to assess blood flow to the muscle of the heart.

Based on clinical studies to date, we believe that in comparison to single photon emission computed tomography (SPECT) MPI, the current standard of care, PET MPI with flurpiridaz F 18 potentially provides: Higher image quality, Increased diagnostic certainty, More accurate risk stratification, Reduced patient radiation exposure.

Conclusion : Flurpiridaz PET myocardial perfusion imaging is more effective than Tc-99m–labeled SPECT, and well tolerated and shows promise as a new tracer for CAD detection and assessment of women, obese patients, and patients undergoing pharmacological stress testing.

Cardio Mag
Volume 1|Issue 19|2020

Reference:
Maddahi J et al. Phase-III Clinical Trial of Fluorine-18 Flurpiridaz Positron Emission Tomography for Evaluation of Coronary Artery Disease. J Am Coll Cardiol. 2020; 76(4): 39-401.

2. False-positive troponin elevation –A case report.

Troponin is an important biomarker for the diagnosis of an acute coronary syndrome (ACS). It increases in response to myocardial injury from significant acute myocardial ischaemia caused by obstructive coronary artery disease.
In other conditions like raised levels have also been noted in conditions not recognized as classical ACS. This include MI with non-obstructed coronary arteries such as takotsubo cardiomyopathy and other acute or chronic conditions such as pulmonary embolus or chronic kidney disease. This is commonly labelled as a 'falsely elevated' troponin although there is some myocardial strain to explain the rise.
Current is a case of falsely elevated troponin levels.

Case presentation:
A 58-year-old male with an extended history of chest pain and numbness in the left arm lasting more than 24 hours. His symptoms had initiated whilst driving but resolved on arrival to hospital. There were no abnormal findings on clinical examination (heart rate 65 b.p.m., blood pressure 108/76mmHg, saturations 98% on air, respiratory rate 16 cycles per minute).
He had type 2 diabetes (2013), hypertension (2014), hypercholesterolaemia (2002), non-alcoholic steatohepatitis (2002), and hepatitis B (2002).
Patient was admitted previously with cTnT positive chest pain, in 2002 (1410 ng/L) and 2015 (1540 ng/L), during which coronary angiography demonstrated unobstructed coronary anatomy and a diagnosis of probable myocarditis was given on each occasion.
An electrocardiogram (ECG) demonstrated no ischaemic changes as shown in figure. However, an initial cTnT was raised at 1588 ng/L (normal range <15 ng/L) and 1842 ng/L when repeated.
Normal renal function [creatinine 102 (normal 62–106 lmol/L)] and a normal haemoglobin (137 g/L).
In Subsequent serial troponins , there was no drop below 1600 ng/L (timeline). Due to this stagnation, a creatine kinase level was measured and found to be only borderline raised at 338 U/L (normal 40–320U/L).

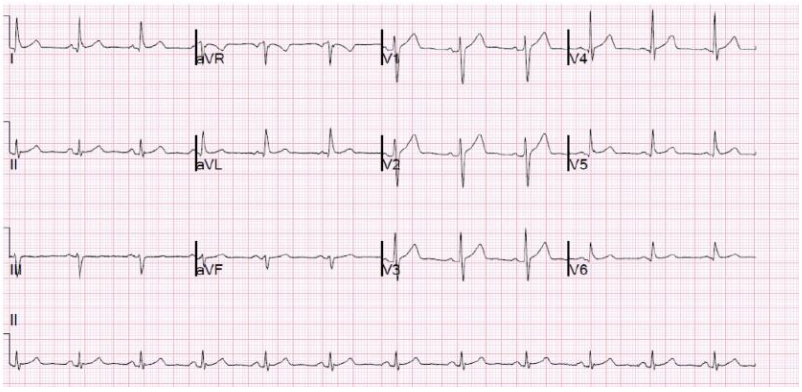
Cardio Mag
Volume 1|Issue 19|2020

An echocardiogram showed no regional wall motion abnormalities and a preserved left ventricular ejection fraction of 60–65%.

CT aortagram was performed which excluded an aortic dissection and within its limits, a pulmonary embolus.

A working diagnosis of acute coronary syndrome was suggested and he underwent a coronary angiogram, showed only mild disease in the right coronary artery and left anterior descending whilst the left main stem and circumflex vessels were unobstructed.

A cardiac MRI with gadolinium was performed which was unremarkable and confirmed preserved bi-ventricular function with no evidence of a scar, fibrosis, or oedema, acute myocardial injury was therefore considered unlikely.



He remained on telemetry and despite 7 days of cardiac monitoring, no arrhythmia was documented. After extensive investigations had excluded myocardial damage and any other clinical condition as a likely cause of the troponin elevation, the biochemistry laboratory was contacted for assistance in elucidating the cause of the persistently elevated cTnT.

Initially, a measurement of cTnI was performed hs cTnI, LOD 2 ng/L 10% CV = 4.7 ng/L, 99th percentile URL = 26.2 ng/L) on the cTnT sample value 1674 ng/L, and was <2 ng/L therefore excluding myocardial injury.

Analytical interference with a false-positive cTnT result was suspected.

Serial dilution of the sample using troponin free diluent was linear (recovery sample 73.1–94.7%, control 81.5–109.2%) although recovery at a one in 10 dilution was <100% compared with the control, that suggested that an analytical interference from an interfering antibody (anti-mouse) was unlikely.

The Roche cTnT assay uses fragment antigen binding portions of 2 cTnT-specific mouse monoclonal antibodies (MAbs) directed against epitopes in the central region of human cTnT.

Subsequent biochemical analysis found the persistently elevated cTnT secondary to macrotroponin T.

With this diagnosis, reassurance was given and he was discharged home with routine follow-up arranged.

A 24-hour Holter demonstrated only sinus rhythm, which reaffirmed the unlikelihood of a cardiac arrhythmia and a dobutamine stress echocardiogram found no evidence of inducible ischaemia with a normal functioning heart.

He was uneventfully discharged from the cardiology.

Discussion:

Cardiac troponin is integral part of diagnosis of a myocardial infarction.

Elevation of cTnT due to macrotroponin is relatively uncommon. Macrotroponin, an immunoglobulin-troponin bound complex is considered as a differential diagnosis when the biochemistry is not reflective of the clinical picture.

Macrotroponins is more common than currently reported. cTnT autoantibodies have been found in up to 9.9% of healthy blood donors. This is comparable with the prevalence of thyroglobulin and thyroperoxidase antibodies.

Conclusion:

A case of false positive elevation of troponin is seen with increased levels of Macrotroponin T.

Reference:

Akhtar Z et al. False-positive troponin elevation due to an immunoglobulin-G-cardiac troponin T complex: a case report. Eur Hear J - Case Rep. 2020; 4: 1–5

Cardio Mag
Volume 1|Issue 19|2020

IN FOCUS

3. A novel platform for remote patient monitoring.

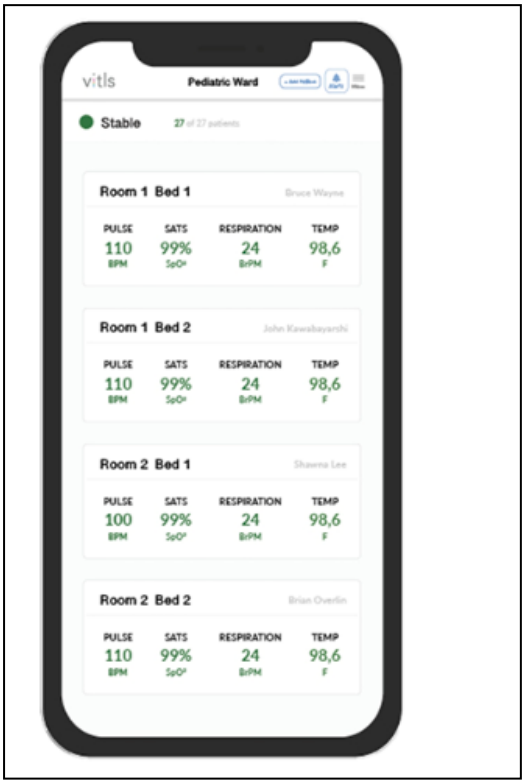
A novel patch is cleared by FDA that keeps track of a patient's heart and respiration rates, heart rate variability, body temperature, and blood oxygenation (SpO2).

It is a wireless, flexible, disposable device with a battery lifetime of about six days. Patients can be sent home wearing one while still being closely monitored remotely.

This is beneficial for continuous monitor and thus improves standard of care in healthcare settings, as well as in the home.

Healthcare needs accurate, clinical grade, continuous monitoring – especially during COVID-19

The Vitls app can be used to program instant notifications for every patient, to see trends over the several days that the patient was monitored, and record notes that can be synced with the clinic's electronic health record (EHR).



The Vitls Platform is compatible with iOS and Android devices, as well as most browsers and many EHRs.

Reference:

Available at: https://www.medgadget.com/2020/07/vitls-platform-cleared-in-u-s-for-remote-patient-monitoring.html. Accessed on 22-07-2020.

Cardio Mag

Volume 1|Issue 19|2020