Cardio Mag

Volume 2|Issue 25|2021

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

- ***Assessment of Predictive value of the atherogenic index of plasma before coronary angiography for chronic total occlusion.***
- ***Successful treatment Dressler's syndrome – A case report.***
- ***A novel heart rhythm monitor.***

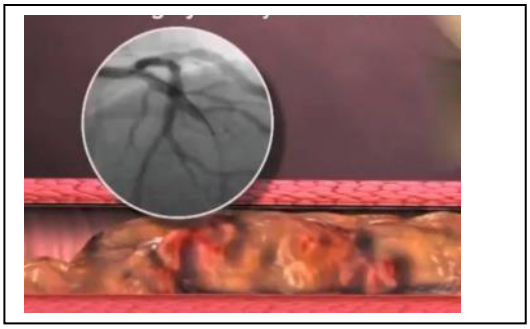
Should you require any specific article or medical information, please feel free to contact us at ***medicalservices@microlabs.in***

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

1. Assessment of Predictive value of the atherogenic index of plasma before coronary angiography for chronic total occlusion.

Cardio Mag

Volume 2|Issue 25|2021



Chronic total occlusion (CTO) is frequently encountered during coronary angiography in patients with coronary artery disease (CAD). CTO is associated with a significantly higher rate of major adverse cardiovascular events.

Atherogenic index of plasma (AIP) is calculated by logarithmic transformation of the ratio of triglyceride (TG) and high-density lipoprotein cholesterol (HDL-C) concentrations

Aim of the current study is to evaluate association of the AIP with CTO development and deduced the usefulness of the AIP for the diagnosis and risk assessment of CTO in clinical practice.

Methods:

A study involving 1100 patients, with chest pain and suspected acute coronary syndrome who had undergone coronary angiography were included.

CTO was defined as an occlusion lasting for more than 3 months based on the first onset of angina pectoris, previous angiogram findings, and previous infarction; TIMI Grade 0.

Non-CTO was defined as stenosis of at least 50% of the luminal diameter in at least one major coronary artery branch.

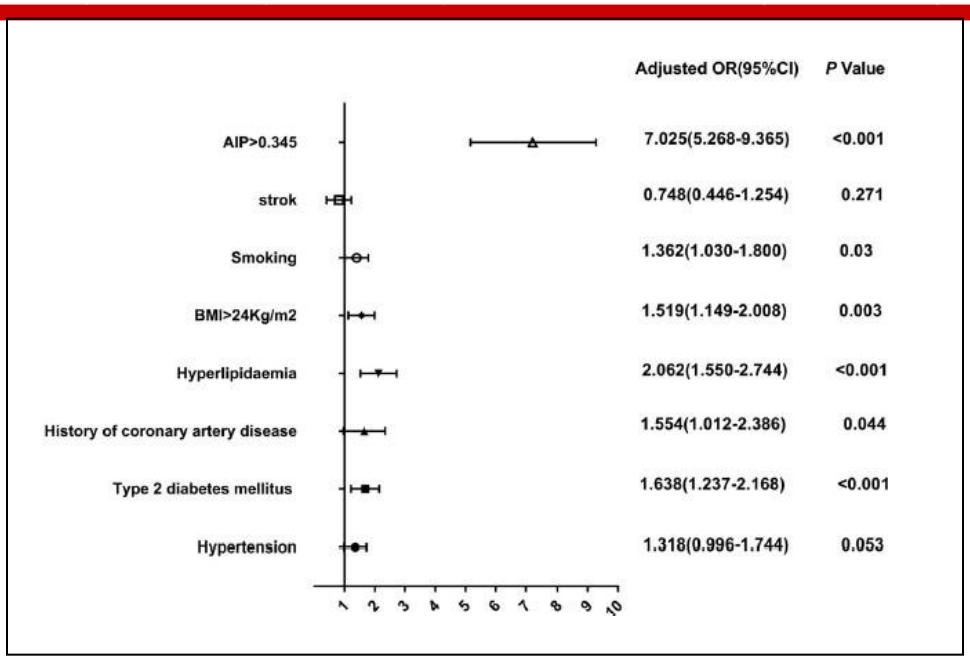
The AIP was calculated by logarithmic transformation of the ratio of TG and HDL-C concentrations (log10 [TG/HDL-C]).

All participants underwent coronary angiography , Severity of coronary artery stenosis was quantified by the Gensini score: 0, no stenosis; 1, <25% stenosis; 2, 25%–50% stenosis; 4, 50%–75% stenosis; 8, 75%–90% stenosis; 16, 90%–99% stenosis; and 32, 100% stenosis.

Results:

Patients in CTO group showed a significantly higher AIP than the control group (0.361 vs. 0.322 ng/ml) (all $p < .05$). Similarly, the GRACE, TIMI, and Gensini scores were also significantly higher in the CTO group than in the control group.

Cardio Mag
Volume 2|Issue 25|2021



Sensitivity test of the AIP for the diagnosis of CTO was 65.6% and the specificity was 78.2%, and the positive and negative likelihood ratios were 3.01 and 0.44, respectively, with a diagnostic OR of 6.84.

AIP was significantly correlated with several biochemical parameters, such as the WBC count, red blood cell (RBC) count, and TC concentration.

Discussion:

In current study, significantly greater AIP values in the CTO group than in the control group based on univariable and multivariable analyses. The AIP was also significantly correlated with the Gensini and GRACE scores and showed significant associations with biochemical parameters such as the WBC and RBC counts.

AIP did show strongest correlation with the Gensini score in all patients, demonstrating its vital role in the development of atherosclerosis.

Conclusion:

AIP can predict the presence of CTO and disease severity in patients with coronary artery disease.

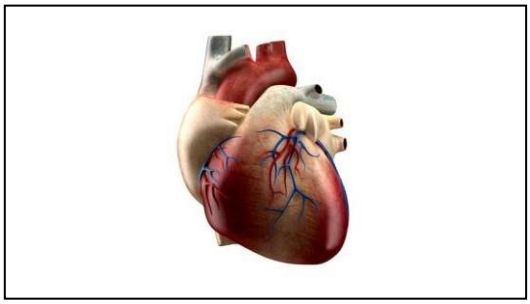
Reference:

Liu T et al. Predictive value of the atherogenic index of plasma for chronic total occlusion before coronary angiography. Clin Cardiol. 2021;1–8.

Cardio Mag

Volume 2|Issue 25|2021

2. Successful treatment Dressler's syndrome – A case report.



Dressler's syndrome can be experienced only in patients with recent myocardial infarction (MI) who have not undergone primary percutaneous coronary intervention (PCI).

Even though guidelines recommend high-dose aspirin administration for the treatment of Dressler's syndrome, evidence for these recommendations was amassed in the pre-PCI era.

Although coronary stenting has become a standard therapy against MI, bleeding and thrombotic concerns on high-dose aspirin administration have occurred in the modern era.

Current is a case of Dressler's syndrome successfully treated successfully.

Case presentation:

A 65-year-old man presented with persistent chest discomfort, chest pain was severe since 1 week before admission; he was suspected acute coronary syndrome.

On examination, the patient was afebrile with an irregular pulse of 108 beats/min and a blood pressure of 98/69 mmHg. The oxygen saturation was 98% on room air. No heart murmurs or edema were noted.

Electrocardiography showed newly detected atrial fibrillation with no ST segment change. It also showed inferior-lateral wall asynergy, with mild mitral valve regurgitation and no pericardial effusion. Preserved Left ventricular contraction was seen with an ejection fraction of 50%.

Laboratory tests revealed elevated of myocardial and liver enzymes and signs of heart failure as follows: white blood cell count, 11,000 cells/mL (neutrophils, 69%; eosinophils, 0.5%); C-reactive protein, 14.3 mg/dL; creatinine kinase (CK), 197 U/L; CK-muscle/brain, 7 U/L; troponin I, 4.4 ng/mL; B-type natriuretic peptide, 357 pg/mL; aspartate transaminase, 81 U/L; alanine aminotransferase, 77 U/L; and total bilirubin level, 2.1 mg/dL.

Chest X ray revealed mild left pleural effusion with no congestion. Immediate coronary angiography demonstrated a middle left circumflex artery occlusion.

Patient then underwent PCI, and a sirolimus-eluting stent was successfully deployed. Myocardial enzymes were monitored by laboratory tests every 4 h after admission, although no CK elevation was noted.

With the clinical course and results from the examinations, diagnosis of recent MI was made, which developed 1 week before admission. He was administered aspirin 100 mg/day, prasugrel 3.75 mg/day, and apixaban 10 mg/day as antithrombotic therapy.

Cardio Mag
Volume 2|Issue 25|2021

Considering the high bleeding risk, antiplatelet drugs were reduced to clopidogrel 75 mg/day (single antiplatelet therapy) on post admission day 14. On post-admission day 23, the patient developed a fever of 39.6 ◦C and experienced a left lateral chest pain.

An audible Pericardial friction rub was noted on auscultation with the forward leaning position. Widespread ST segment elevation and PR segment depression were demonstrated in the electrocardiogram.

Eosinophil count increased to 5.1% (291 cells/mL) in the laboratory test, and echocardiography revealed a newly detected pericardial effusion of 6 mm. A diagnosis of Dressler's syndrome was made and administered colchicine and Paracetamol at 0.5 and 2000 mg/day, respectively.

Physical signs and laboratory data of patientss improved within several days, and he was discharged on post-admission day 32.

After three months, widespread ST segment elevation had returned to normal, and his pericardial effusion had improved. Colchicine 0.5 mg/day was continued without any side effects for 6 months, with no recurrence in symptoms noted or examinations repeated.

Discussion:

Dressler's syndrome is a secondary form of pericarditis that is typically demonstrated weeks to months after MI, is presumed to be mediated by an autoimmune mechanism.

In Dressler syndrome, High-dose aspirin administration (2000–4000 mg/day) is recommended as class I therapy in guidelines, and administration of other non-steroidal anti-inflammatory drugs should be avoided because they may impair scar formation.

Colchicine, an anti-inflammatory drug that targets the white blood cells and causes microtubule depolymerization, which in turn causes motility, phagocytosis, and degranulation. It also inhibits interleukin-1 beta and interleukin-18 by interfering with the NLRP3 inflammasome protein complex, which is increasingly recognized to have a role in acute coronary syndrome.

Conclusion:

A case of Dressler's syndrome was successfully managed with Colchicine and Paracetamol.

Reference:

Nomoto F et al. A case of Dressler's syndrome successfully treated with colchicine and acetaminophen. J Cardiol Cas. 2021 Mar 1;23(3):131-5.

Cardio Mag
Volume 2|Issue 25|2021

IN FOCUS

3. A novel heart rhythm monitor.

Researchers have developed an AI-powered sound system that can detect irregular heartbeats. The system sends inaudible sounds into its close environment and then analyzes the reflected waves to identify individual heartbeats from someone sitting close to it.

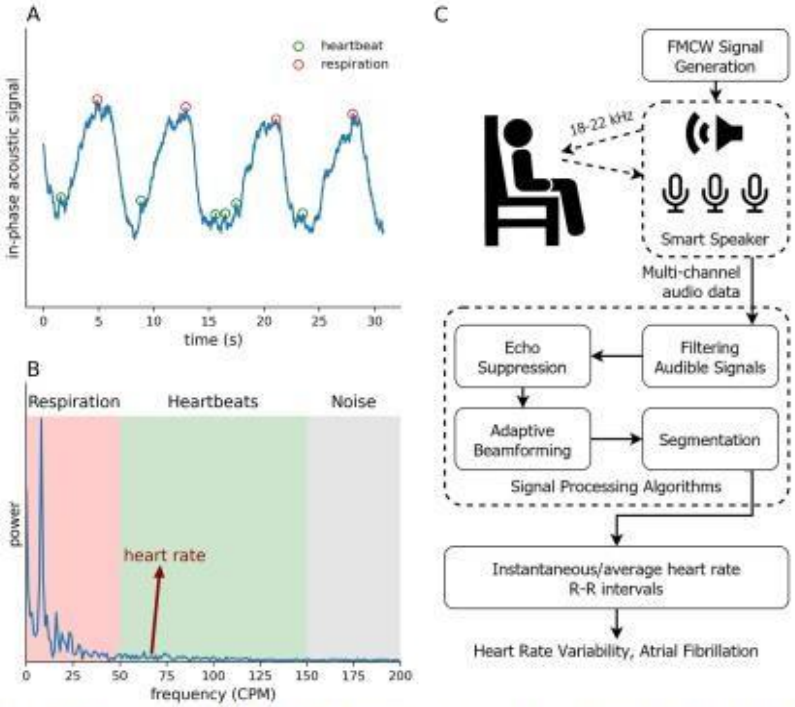


Fig. The processing pipeline of our system is able to extract the tiny motion of heartbeats from the raw active sonar signal. A The displacement from respiration and heartbeat in the in-phase component of the raw active sonar signal. While breathing motion (blue curve) is strong, the heartbeats (red circle) are weak and not reliably observable in this signal. **B** The frequency domain with the respiratory frequency range, heart rate range, and high-frequency noise. The respiratory signal strength is much higher and its harmonics spread into heart rate frequencies preventing the latter from being reliably extracted by just filtering. **C** The different algorithms in our system to separate heart motion from respiration and extract individual heartbeats.

It may be useful in detecting heart rhythm disorders, such as cardiac arrhythmias.
A major challenge in developing the technology was detecting the heartbeats and distinguishing them from breathing sounds, which are much louder.

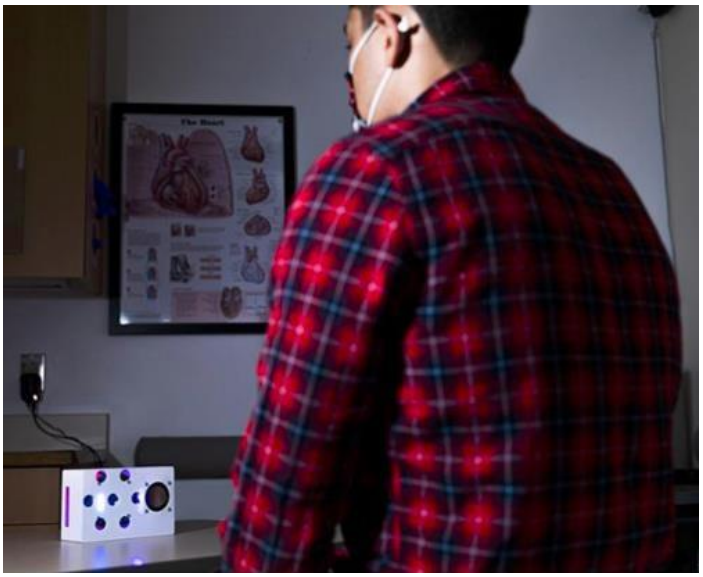
Cardio Mag

Volume 2|Issue 25|2021

Smart speakers have multiple microphones, using which a new beam-forming algorithm was designed to help the speakers detect heartbeats.

AI powered speakers employ an algorithm that uses the signals from multiple microphones on the device to identify the heartbeat, can use multiple microphones to listen to one voice in a room filled with other noises.

This system detected a median inter beat interval that was within 30 milliseconds or less of that detected by the control device, suggesting that it is comparable in terms of accuracy.



Reference:

Wang A et al. Using smart speakers to contactlessly monitor heart rhythms. Communications Biology. 2021 Mar 9;4(1):1-2.

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