

CARDIO ROUNDS NEWSLETTER

Volume 1 | Issue 2 | 2022

IN THIS ISSUE

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you “Cardio rounds” which contains latest and interesting news in the field of Cardiology

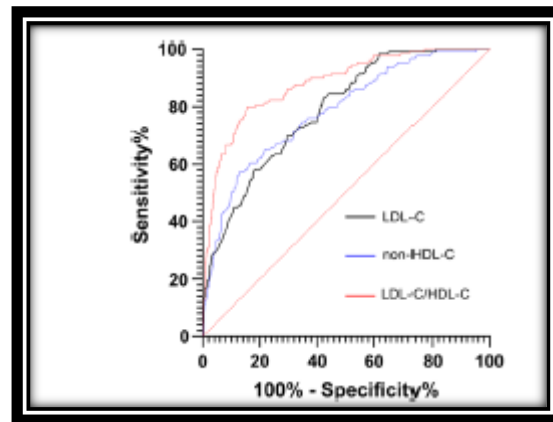
- **Comparison between LDL-C/HDL-C ratio and non-HDL-C/ LDL-C ratio in assessing the severity of coronary artery disease in STEMI patients**
- **Comparisons of the patients who underwent MitraClip in urgent versus non-urgent settings.**
- **Evaluation of the usefulness of oedema index for estimating heart failure status and for predicting prognosis in patients with Acute Heart Failure**
- **Intravascular Lithotripsy in severely calcified lesion in a poorly expanded stent: A Case Report**

Comparison between LDL-C/HDL-C ratio and non-HDL-C/ LDL-C ratio in assessing the severity of coronary artery disease in STEMI patients

Atherosclerosis is a heart disease characterized by the narrowing of the arteries caused by build-up of plaque. It is a slow and complex process, recognized as "Injury Response Theory:" and is divided into different processes such as 1. Stimulation of arterial intima and blood lipid adhesion by physical or chemical factors to the blood vessel. 2. Deposition of blood lipids in the injured arterial intima, stimulating further injury of the arterial intima and resulting in further deposition, 3. Stimulation and proliferation of smooth muscle cells and fibroblasts in the inner wall of the artery by deposition of fats leading to the development of fibrous plaques. Increased level of low-density lipoprotein cholesterol is the major reason in the occurrence of atherosclerosis.

A study conducted by Gao P et al, aimed to explore LDL-C /HDL-C ratio and non-HDL-C on the severity of coronary artery disease in STEMI patients. Almost 901 patients who received coronary angiography due to chest pain were enrolled for this study. Of enrolled patients, 772 patients with STEMI were divided in the test group, and 129 patients with basically normal coronary angiography in the control group. Fasting blood lipids after admission was measured, and Gensini score was used to determine the severity of coronary artery disease. In both groups, LDL-C/HDL-C and non-HDL-C indexes were statistically different. While in the test group, total cholesterol, triglycerides, LDL-C, high density lipoprotein cholesterol, non-HDL-C, arteriosclerosis index (AI), and LDL-C/HDL- could correlated with the Gensini score. According to multiple linear regression analysis, LDL-C/HDL-C had the most correlation with the Gensini score, while ROC curve analysis revealed that LDL-C/HDL-C can predict whether patients with chest pain belongs to STEMI or non STEMI group. (Fig 1)

Fig: 1 ROC curves of LDL-C, non-HDL-C, and LDL-C/HDL-C



If the cut off value is 2.15, sensitivity is 0.845, and specificity is 0.202, which clearly indicates that LDL-C/HDL-C is an effective indicator for predicting whether patients with chest pain have STEMI or not.

Conclusion: LDL-C/HDL-C ratio in patients with STEMI can correlated the severity of coronary artery disease, when compared to ratios of non-HDL-C/ LDL-C. LDL-C/HDL-C ratio can better analyse and predict the severity of coronary artery disease

References: Gao P, Wen X, Ou Q, Zhang J. Which one of LDL-C/HDL-C ratio and non-HDL-C can better predict the severity of coronary artery disease in STEMI patients. BMC Cardiovas Disord. 2022 Dec;22(1):1-7.

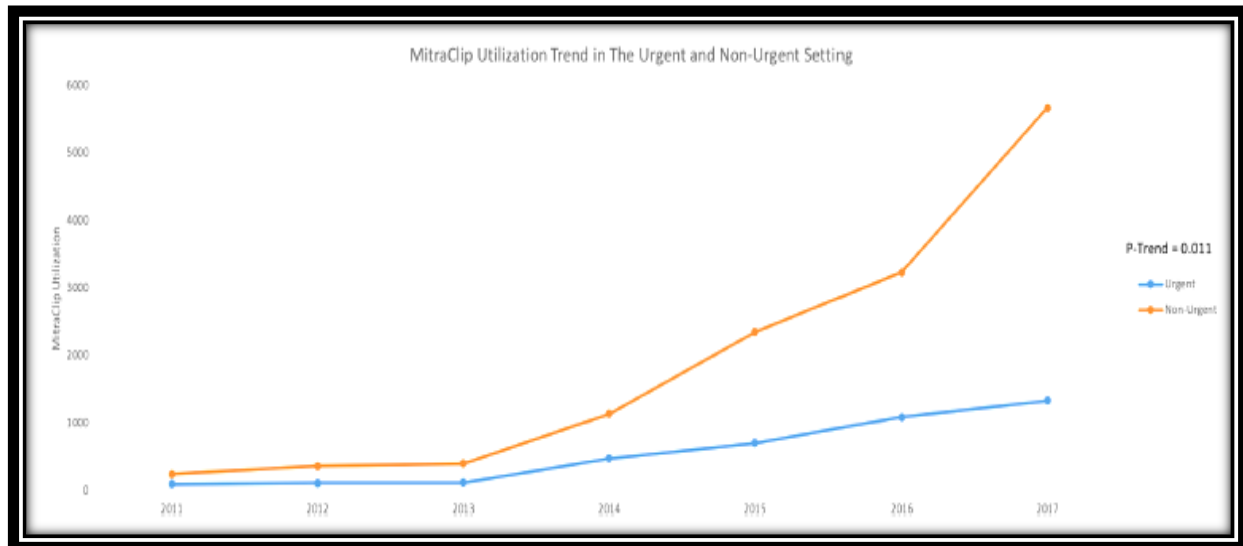
Comparisons of the patients who underwent MitraClip in urgent versus non-urgent settings.

Mitral valve regurgitation is a common valvular heart disease with a prevalence rate of more than 2 million patients. For those, who are not candidates for surgical repair, percutaneous mitral valve repair is a preferred option to control severe mitral regurgitation. Only approved percutaneous device for mitral valve repair by USFDA is MitraClip. For critically ill patients not able to survive surgery, MitraClip seems an attractive option. Unfortunately, such patients have been excluded by clinical trials, for which data on such patients remains.

This study aimed to analyse the outcome of percutaneous mitral valve repair using MitraClip in patients with mitral regurgitation in the urgent setting vs in a non-urgent setting. To conduct this study, Nationwide Inpatient Sample database years 2011–2017 was used and hospitalizations for MitraClip in the urgent setting were identified. To compare the patients who underwent MitraClip in urgent vs non-urgent settings, propensity score matching was used.

It was found that from the year 2011 to 2017, almost 15,993 patients underwent MitraClip procedures while 24.6% were in urgent settings and 75.4% were in non-urgent. Younger patients were found in the urgent group with a higher burden of comorbidities such as diabetes, atrial fibrillation, renal failure and pulmonary circulatory disorders. Multivariable logistic regression revealed no statistically significant difference in mortality between urgent and non-urgent groups. Propensity score matching revealed no statistically significant difference in the in-hospital mortality between urgent and non-urgent groups. Urgent group showed higher risks of acute kidney injury and discharge compared to non-urgent group. A statistically significant increase in trend in the utilization of MitraClip in urgent settings from 27.7% in 2011 to 23.4% in 2017 has been observed (**Fig:2**)

Fig:2 Utilization trend of MitraClip in the urgent setting over the study period



Conclusion: This study highlighted that there were no statistically significant differences in in-hospital mortality between urgent percutaneous mitral valve repair using MitraClip procedures when compared to patients in the non-urgent setting

Reference

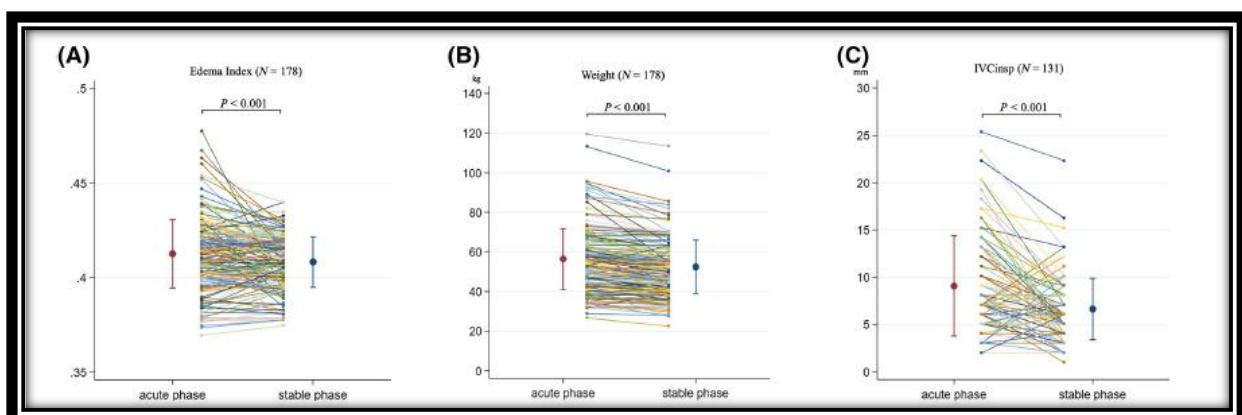
Al-Khadra Y, et al. National outcomes of urgent vs. non-urgent percutaneous edge-to-edge transcatheter mitral valve repair. *Int J Cardiol Heart Vasc.* 2022 Jul 16;41:101087.

Evaluation of the usefulness of oedema index for estimating heart failure status and for predicting prognosis in patients with Acute Heart Failure

Most of the patients with heart failure have a combination of both intravascular congestion and tissue congestion. Patients with predominant intravascular congestion usually have acute onset and do not require diuretics for treating heart failure, while patients with predominant interstitial congestion have a gradual progressive pulmonary and peripheral oedema. According to studies, hypertensive heart failure defined as systolic blood pressure > 140 mmHg on admission is due to intravascular congestion. Therefore, it becomes important to assess the quantity of fluid retention while treating heart failure. Bioelectrical impedance analysis is a commonly used tool for the assessment of body composition not only in the fields of cardiology but also in the field of hepatology, nephrology, and nutrition.

This prospective single-centre study aimed to analyse the differences in extracellular fluid volume assessed by bioelectrical impedance analysis between acute heart failure patients with and without high systolic blood pressure. Around 178 patients hospitalized with acute heart failure were enrolled to conduct this study. Extracellular water, intracellular water, total body water, and Extracellular water -to- total body water ratio by Bioelectrical impedance analysis were evaluated. Conventional parameters such as weight, Nterminal pro brain natriuretic peptide values, and echocardiography parameters on admission and before discharge were analysed and recorded. All cause death and re admission due to heart failure was considered as 1 year outcomes.

Fig:3 Changes in oedema index and conventional parameters from the acute phase to the stable phase



Systolic blood pressure > 140 mmHg on admission [clinical scenario 1 (CS1) group] was compared with Systolic blood pressure of ≤ 140 mmHg on admission (non-CS1 group). It was found that, odema index on admission of 83 patients in the CS1 group was lesser than 95 patients in the non-CS1 group. From the day of admission to before discharge, the change in odema index was not significant in the CS1 group but was significant in the non-CS1 group (**Fig:3**). However, delta-extracellular water, delta- intracellular water, delta-total body water, and delta oedema index of the CS1 group were significantly smaller than those of the non-CS1 group. During the 1-year follow-up period, 15% patients were found to be deaths and 28%, patients had to re-admit due to acute HF. Patients having higher oedema index before discharge had significantly more cardiac events than patients with low oedema index. According to Cox regression analysis, higher oedema index was significantly associated with worse outcome in non-CS1 group but not in CS1 group

Conclusion: In patients with high systolic blood pressure, oedema index on admission was not elevated. However, in patients with low systolic blood pressure, changes in extracellular water, intracellular water, total body water, and oedema index were higher than those in patients with high systolic blood pressure.

Intravascular Lithotripsy in severely calcified lesion in a poorly expanded stent: A Case Report

Calcification of coronary arteries lowers the success rates of the surgery and increases the periprocedural complications. However, lithotripsy technology, a novel and common treatment strategy of ureterorenal calculi is adapted in intravascular lithotripsy for patients with heavily calcified coronary arteries. In Intravascular lithotripsy technique, multiple lithotripsy emitters are mounted on a traditional catheter platform delivering localized pulsatile sonic pressure waves to circumferentially modify vascular calcium by increasing calcium fractures. Intravascular lithotripsy works by sending acoustic pressure waves and altering the calcium plaque that improves vessel compliance leading to optimization of stent deployment.

A 63-year-old male patient with a past medical history of diabetes, hyperlipidaemia, hypertension, severe COPD and pulmonary hypertension along with the symptoms of unstable angina was presented. The patient has been smoking since last 50 years. Echocardiogram revealed 60% of ejection fraction with a pulmonary artery pressure of 70mmHg. ECG test showed sinus rhythm with occasional Premature ventricular contractions and incomplete Right bundle branch block. An episode of supraventricular tachycardia with heart rate of 170 beats per minute was observed. Troponin level was found to be elevated to 0.15 ng/dl.

Fig: 4 Right coronary artery with severe residual stenosis post balloon angioplasty and stenting.



Coronary angiogram revealed 95% stenosis in the right coronary artery which was treated with balloon angioplasty and stenting with drug eluting stent. After multiple inflations with noncompliant balloon (Fig 4), it was observed that the patient had persistent residual in stent stenosis of 70%. Shockwave C2 Coronary Intravascular Lithotripsy catheter was used to treat stenotic lesion in poorly expanded stent resulting in 0% residual stenosis. At 30 days and 12 months, patient was followed for major adverse cardiovascular events and remained major adverse cardiovascular events free

Conclusion: Coronary Intravascular lithotripsy was safe and at 12-month follow-up, it effectively facilitated stent expansion in severely calcified lesion in a poorly expanded stent with MACE free

References: Raxwal T, Balhara C, Parekh D. Intravascular Lithotripsy for Underexpanded Stent in Heavily Calcified Coronary Artery Disease. Case Rep Cardiol. 2022 Jul 15;2022:7075933



This scientific input is prepared from the Department of Medical Services, an initiative of M/s Micro Labs Limited under the aegis of Micro Knowledge Academy. The information contained herein is for education purpose only. The content is developed by compiling information from various authentic and published literatures. Although great care has been taken to assure the accuracy of the publication, M/s Micro Labs Limited shall not be responsible or in any way liable for any inaccuracy, errors, or omissions resulting from negligence or otherwise howsoever or any consequences arising there from. In spite of best efforts, the information in this publication may become outdated over time. M/s Micro Labs Limited shall not be responsible in any manner whatsoever, for any action taken, opinions expressed, advice rendered or accepted, any direct, incidental, special or consequential loss and damage caused on the basis of any material or information presented in this publication / update.