

# ***CARDIOMAG NEWSLETTER***

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***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***

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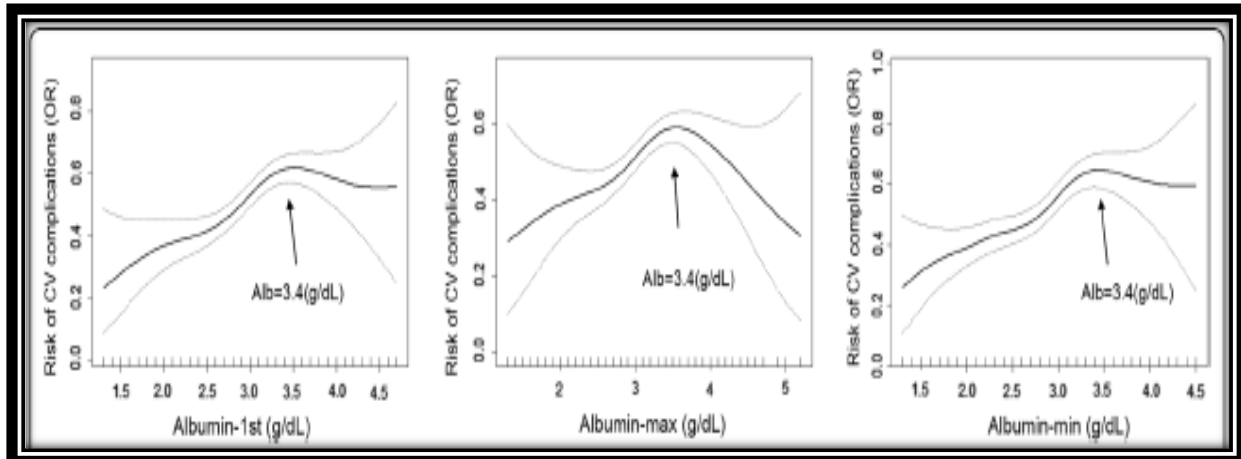
## Association of Blood Albumin with prognosis in patients with Chronic Kidney Disease during Intensive Care Unit

Globally, chronic kidney disease is a common health problem, with an estimated prevalence rate of 13.4%. Though medical sciences have come out with different treatment strategies for patients with CKD, life expectancy is significantly decreased in these patients compared to people with normal kidney function. At the same time, cardiovascular complications remain the leading cause of death among CKD patients than CKD itself.<sup>1</sup> CKD leads to a systemic and chronic pro-inflammatory condition contributing to vascular and myocardial remodelling processes resulting in the formation of atherosclerotic lesions, vascular calcification, vascular senescence, myocardial fibrosis and cardiac valves calcification.<sup>2</sup>

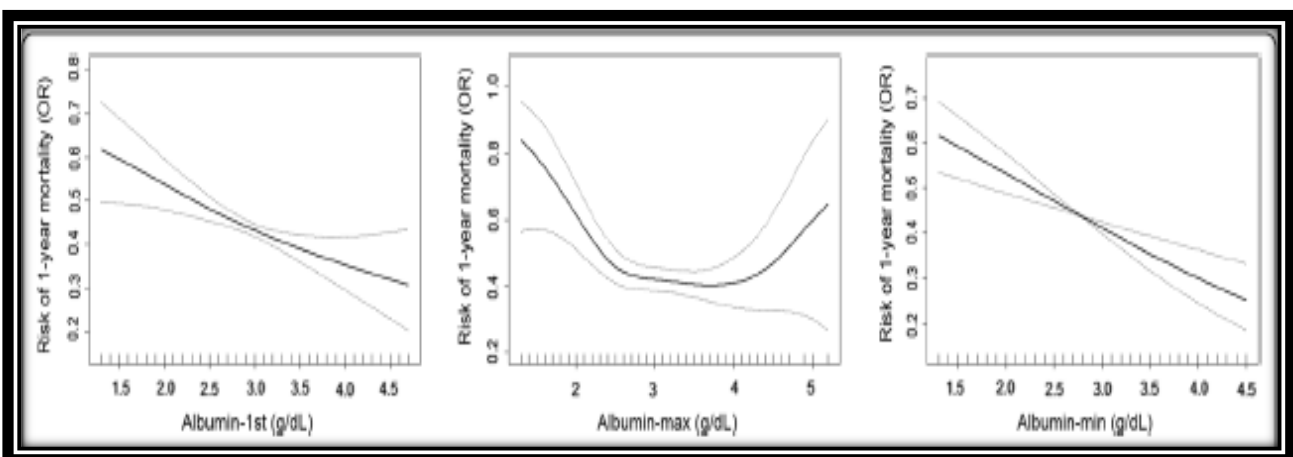
A study by Hung F, et al. aimed to investigate if decreased level of blood albumin is associated with an increased risk of cardiovascular complications in 925 ICU patients with CKD. To conduct this study, medical Information Mart for Intensive Care III database was used. Patients who have been measured for blood biochemistry and admitted in ICU, were recorded. To analyse the associations between blood albumin levels and risks for CV complications and 1-year mortality, multivariable logistic regression models were used.

Of the total enrolled patients, cardiovascular complication including heart failure, myocardial infarction or stroke was 50.8%, while 43.9% patients died during the follow-up of 1 year after discharged. Single-factor smooth curve suggested a curvilinear relationship between blood albumin level and the chances of cardiovascular complications (**Fig:1 and Fig: 2**). The “inflection point” of blood albumin level was 3.4 g/dl. Blood albumin level and 1-year mortality risk showed almost linear relationship with a downward trend.

**Fig 1: Single-factor smooth curve on association between blood albumin level and risk of CV complications in CKD patients**



**Fig 2: Single-factor smooth curve on association between blood albumin level and risk of 1-year mortality in CKD patients**



This study also revealed that reduced blood albumin level may contribute to decrease the risk for cardiovascular complications and higher risk for 1-year mortality. Also, albumin therapy showed an improved effect on risk of cardiovascular complications and 1-year mortality risk in patients with CKD

**CONCLUSION: This study concluded that CKD patients with decreased blood albumin levels during ICU were related to lower risk for cardiovascular complications and increased risk of 1-year mortality**

### **References**

1. Huang F, et al. The association between blood albumin level and cardiovascular complications and mortality risk in ICU patients with CKD. BMC Cardiovas Disord. 2022 Dec;22(1):1-0.
2. Jankowski J, Floege J, Fliser D, Boehm M, Marx N. Cardiovascular disease in chronic kidney disease: pathophysiological insights and therap opt. Circ. 2021 Mar 16;143(11):1157-72.

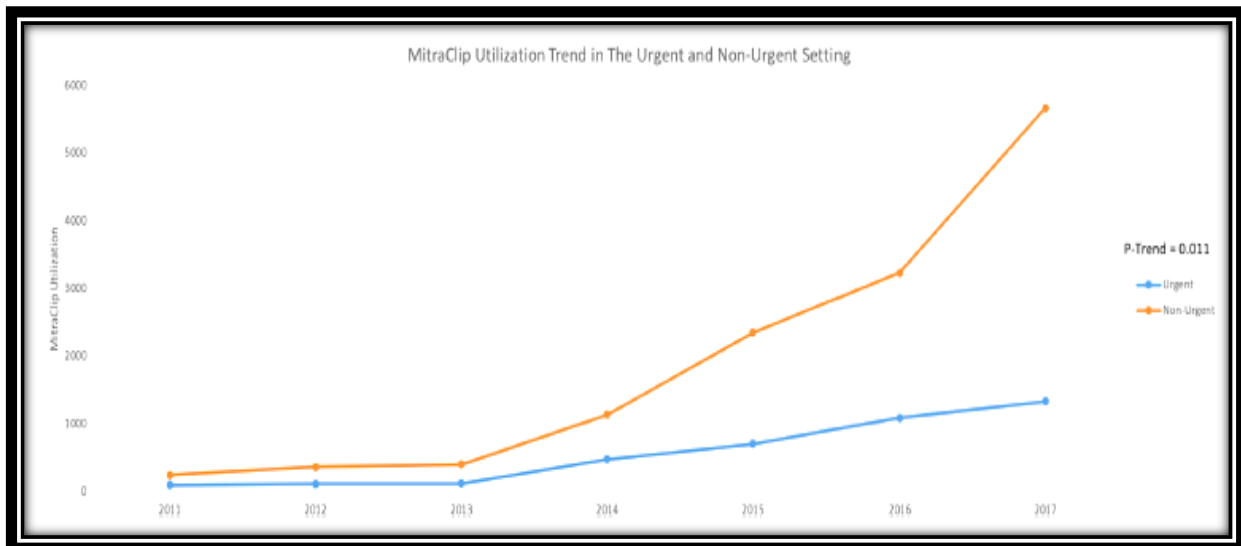
## Outcomes of transcatheter edge-to-edge Mitral Valve Repair with the MitraClip system in the urgent setting

Mitral valve regurgitation, a common valvular heart disease has a prevalence rate of more than 2 million patients. For those, who are not eligible 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. Critically ill patients not able to continue with surgery, MitraClip seems an attractive option. Unfortunately, such patients have been excluded by clinical trials, for which data on such patients remains unclear.

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. In the urgent group, younger patients had a higher burden of comorbidities such as diabetes, atrial fibrillation, renal failure and pulmonary circulatory disorders. Multivariable logistic regression revealed no statistically significant differences in mortality between urgent and non-urgent groups, while propensity score matching found 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:3)**

**Fig:3 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

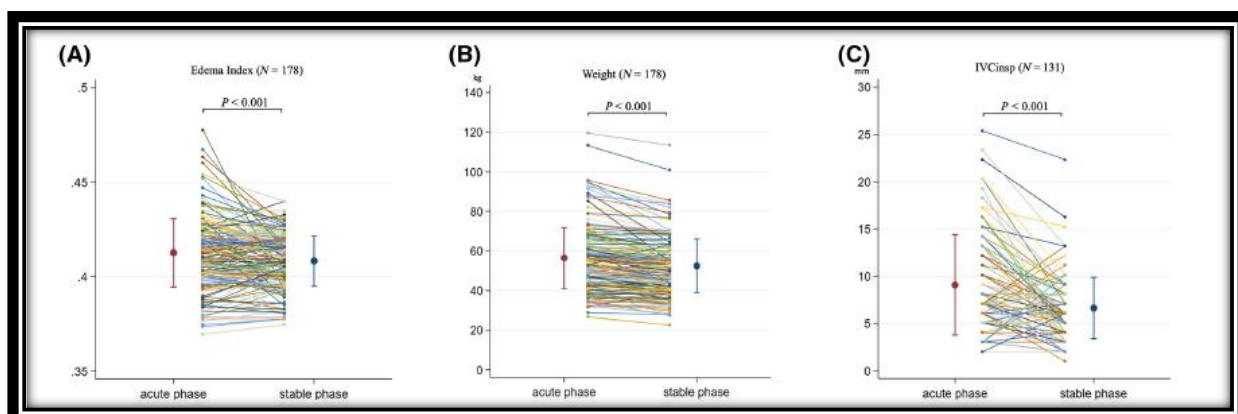
Al-Khadra Y,et al. National outcomes of urgent vs. non-urgent percutaneous edge-to-edge transcatheter mitral valve repair. Int J Cardiol Heart Vasc. 2022 Jul 16;41:101087.

## Assessment of differences in extracellular fluid volume by bioelectrical impedance analysis between acute heart failure patients with and without high systolic blood pressure

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:4 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  $\leq 140$  mmHg on admission (non-CS1 group). It was found that, oedema 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 oedema index was not significant in the CS1 group but was significant in the non-CS1 group (**Fig:4**). 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.

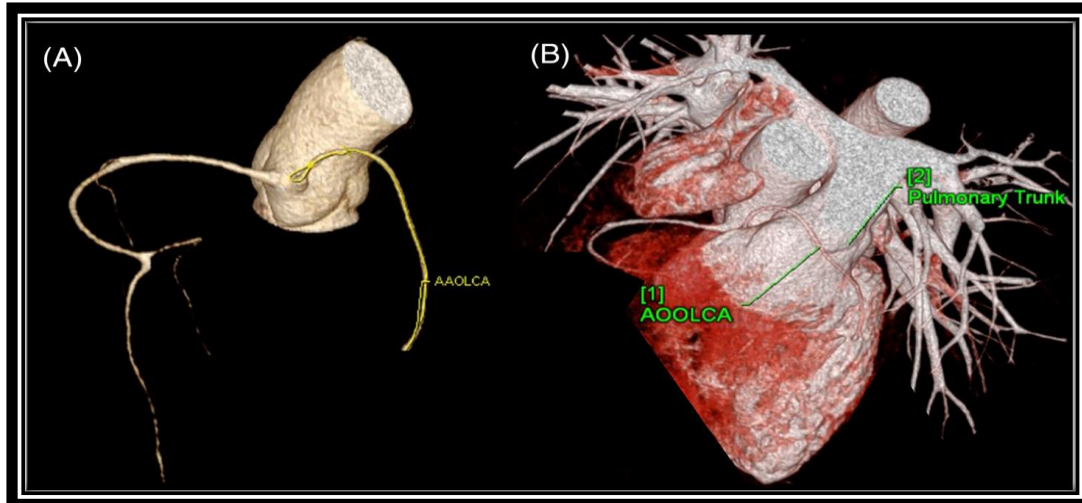
**Reference:** Namba Y, et al. Differences in extracellular fluid volume between acute heart failure patients with and without high systolic blood pressure. ESC Heart Fail. 2022 Jul 13.

## **Detection of coronary artery anomalies during myocardial infarction with non-obstructive coronary arteries: A Case Report**

Congenital coronary artery anomalies are characterized by abnormalities of coronary arteries in the origin, course, size or number. Anomalous aortic origin of a coronary artery means a coronary artery arising from the inappropriate sinus of valsalva with its prevalence rate between 0.1 and 1%. Anomalous aortic origin of a coronary artery can cause sudden cardiac death or symptoms of ischaemia. Though left coronary artery arising from right sinus is less prevalent than the origin of right coronary artery from the inappropriate sinus, but has the higher risk of sudden cardiac death

A 35-year-old male patient was admitted in a secondary care centre with typical angina at rest. Patient had past medical history of chest pain 5 years before with spontaneous resolution, beside that no other records were found. ECG revealed infero-lateral ST elevation and coronary angiography showed anomalous aortic origin of left coronary artery from right Valsalva sinus with a long pre-pulmonic course and without coronary obstruction. Peak high-sensitivity troponin I was 4366.8 ng/L on the first day of admission. Elevated C-reactive protein with negative procalcitonin and normal blood count were observed. The patient was then referred 3 months later to the tertiary care centre to perform a surgical evaluation of the coronary-anomaly. At the time of admission, the patient reported no symptoms.

**Fig5: 3D coronary computed tomography angiography**



Coronary computed tomography angiography was conducted to assess the anatomy of the anomalous coronary artery (**Fig 5**). Invasive coronary angiography and intravascular ultrasound evaluation did not reveal any pathological finding. Stress cardiac magnetic resonance was performed to assess induced myocardial ischaemia. At peak dobutamine infusion (i.e. 40 mcg/kg/min), neither perfusion defect nor regional kinetic abnormality was identified. Later, sub-epicardial late gadolinium enhancement involving infero-lateral segments was identified with the diagnosis of “myocarditis”. To confirm myocarditis, laboratory tests were repeated which revealed mild increase in the level of troponin I but normal CK-MB and negative inflammatory markers. As recommended by recent European Society of Cardiology guidelines, a full panel for myocarditis, tested negative for infections or autoimmune diseases.

**Conclusion: This study highlighted the importance of cardiac magnetic resonance to rule out ischemia as well as to check for tissue abnormalities along with other possible causes of chest pain in a patient suspected with acute myocardial infarction**

## References

Disabato G, et al. Myocardial infarction with non-obstructive disease and anomalous coronary origin: look for the common in the uncommon. ESC Heart Fail. 2022 Jul 9



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