Cardio Mag

Volume 2|Issue 3|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

- ***Vericiguat in heart failure with reduced ejection fraction.***
- ***Severe TR with Traumatic Papillary Muscle Rupture – A case report***
- ***Transfemoral Transcatheter Tricuspid Valve Replacement System***

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

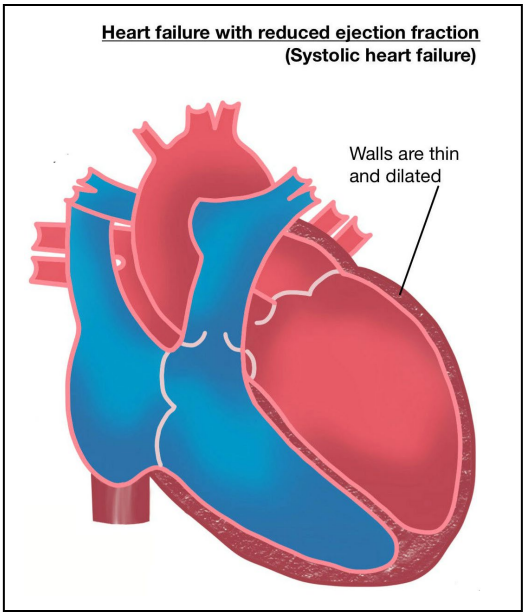
Looking forward to your valuable feedback.
Best Regards,
Medical Team, Micro Labs Limited

1. Vericiguat in heart failure with reduced ejection fraction.

Heart failure is a clinical syndrome and a global health priority. Heart failure with reduced ejection fraction (HFrEF) is increasing with 1.3–4.6 million people are affected by CHF with a prevalence of 0.12%–0.44% in India.

New agents are important in worsening chronic heart failure (HF) requiring hospitalization where, after discharge, cardiovascular event rates are high.

Insufficient generation of cyclic guanosine monophosphate (cGMP) by soluble guanylate cyclase (sGC) contributes to the pathophysiology of heart



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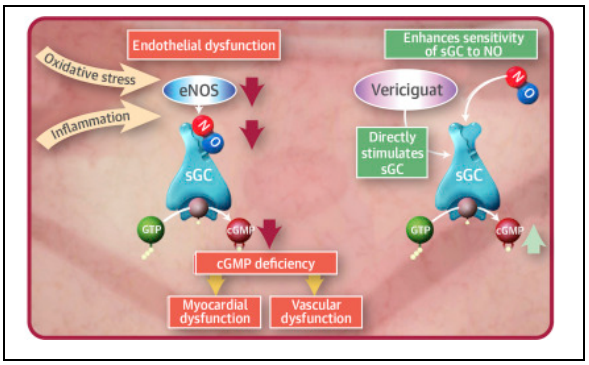
failure with preserved ejection fraction (HFpEF) via cardiac, vascular, and peripheral mechanisms. Vericiguat is a novel agonist of sGC differ from other agents targeting the cGMP pathway in their nitric oxide (NO)-independent capacity to increase sGC activity.



Methods:

Randomized , double-blind , placebo-controlled phase III trial, with 5048 patients with chronic heart failure (New York Heart Association class II, III, or IV) and an ejection fraction of less than 45%. Elevated natriuretic peptide level -For patients in sinus rhythm, plasma B-type natriuretic peptide (BNP) level of at least 300 pg per millilitre or an NT-proBNP level of at least 1000 pg per millilitre, For patients in atrial fibrillation, BNP level of at least 500 pg per milliliter or an NT-proBNP level of at least 1600 pg per milliliter. Also included patients receiving sacubitril–valsartan.

Patients with systolic blood pressure of less than 100 mm Hg; concurrent or anticipated use of long-acting nitrates, soluble guanylate cyclase stimulators, or phosphodiesterase type 5 inhibitors; and use of intravenous inotropes or implantable left ventricular assist devices were exclude from study.

Patients received vericiguat (dose 10 mg once daily) or placebo, in addition to guideline-based medical therapy. The primary outcome was a composite of death from cardiovascular causes or first hospitalization for heart failure.

Results:

Baseline characteristics were matched in the two groups.
At 11 months, a primary-outcome event occurred in 895 of 2524 patients (35%) in the vericiguat group and in 970 of 2522 patients (38%) in the placebo group (P = 0.02). A total of 689 patients (27%) in the vericiguat group and 747 patients. (29%) in the placebo group were hospitalized for heart failure. Death from cardiovascular causes occurred in 412 patients (16 %) in the vericiguat group and in 439 patients (17%) in the placebo group .
The composite of death from any cause or hospitalization for heart failure occurred in 955 patients (38%) in the vericiguat group and in 1030 patients (40%) in the placebo group (P = 0.02).
Hypotension occurred in 9% of the patients in the vericiguat group and in 7% of the patients

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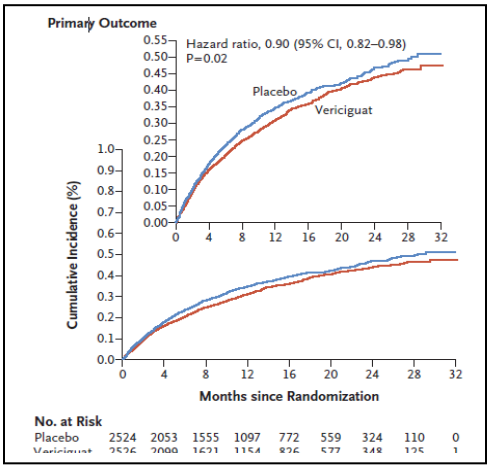
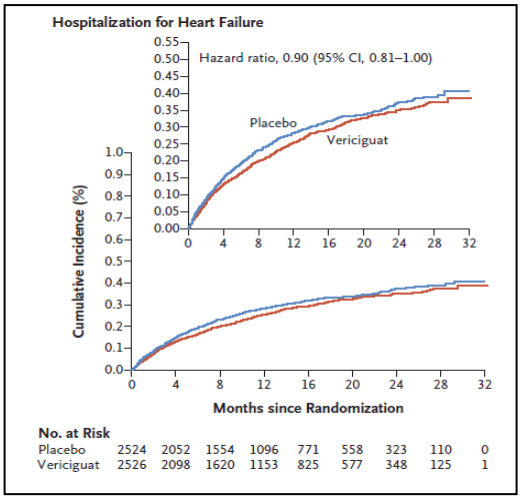
in the placebo group (P = 0.12), and syncope occurred in 4.0% of the patients in the vericiguat group and in 3.5% of the patients in the placebo group (P = 0.30).



Discussion:

Heart failure is a major burden, with many patients facing a considerable risk of morbidity or recurrent hospitalization.

In contrast to antagonizing counter regulatory neurohormonal pathways by many other therapies for heart failure, vericiguat enhances the cyclic GMP pathway by directly stimulating soluble guanylate cyclase through a binding site independent of nitric oxide and by sensitizing soluble guanylate cyclase to endogenous nitric oxide. This selectivity in cyclic GMP generation does not occur with nitrates or phosphodiesterase inhibitors.



In this study with chronic heart failure and a reduced ejection fraction, the incidence of the composite of death from cardiovascular causes or hospitalization for heart failure was lower with vericiguat than with placebo. This difference favoring vericiguat appeared after approximately 3 months of treatment and persisted throughout the trial.

Follow up of initial 15-week the haemoglobin level was slightly lower in the patients receiving vericiguat than in those receiving placebo.

At follow-up of 11 months, absolute event-rate reduction was 4 events per 100 patient-years.

Conclusion:

Vericiguat significantly improved cardiovascular outcomes and reduced risk of hospitalisations compared to placebo in patients with reduced ejection fraction of heart failure.

Reference :
Armstrong PW et al. Vericiguat in Patients with Heart Failure and Reduced Ejection Fraction. New Engl J Med. 2020; 1-11.

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2. Severe Tricuspid Regurgitation with Traumatic Papillary Muscle Rupture – A case report

Tricuspid valve injuries occur due to blunt chest trauma. Motor vehicle accidents (MVA) are a common cause of blunt trauma to the heart. Tricuspid valve(TV) is not usually involved. The aortic valve is most commonly involved, followed by the mitral valve and finally the TV.

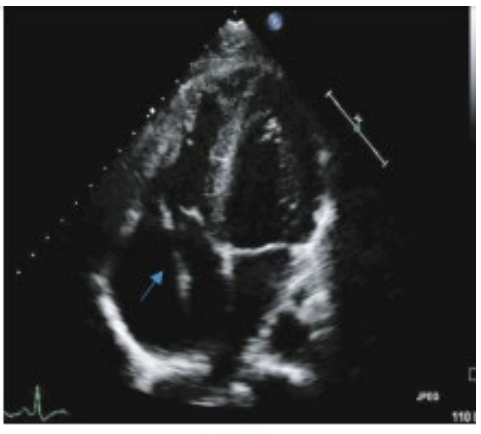
Mechanism of injury to TV in these cases tends to be a rapid deceleration force combined with an increase in intracardiac right chamber pressures . In a vast number of cases of MVA, cardiac injury tends to be overlooked due to other overt injuries. Injury to the TV can be silent depending on the severity of structural damage

With new 3D ECHO , more precise site of injury to Tricuspid valve can be assessed.

Case presentation:

A 23-year-old healthy male after a MVA, had sustained multiple injuries including bilateral hemo and pneumothoraxes. An admission transthoracic echocardiogram (TTE) revealed severe TR of unclear mechanism.

He was asymptomatic and haemodynamically stable. He had abrasion marks on the chest . Cardiovascular examination revealed prominent internal jugular vein c-v waves and a soft grade 2/6 pansystolic murmur at the left lower parasternal border. No signs of heart failure.



(a)

Sinus tachycardia and an early repolarisation pattern were noted on the 12-lead electrocardiogram. He had normal laboratory blood parameters.

On TTE, a moderately enlarged right ventricle (RV) and right atrium, with preserved RV systolic function, was noted. There was a flail TV leaflet and an oscillating mass in the right atrium (Figure (a)). Avulsion of the anterior papillary muscle from the RV wall was suspected.

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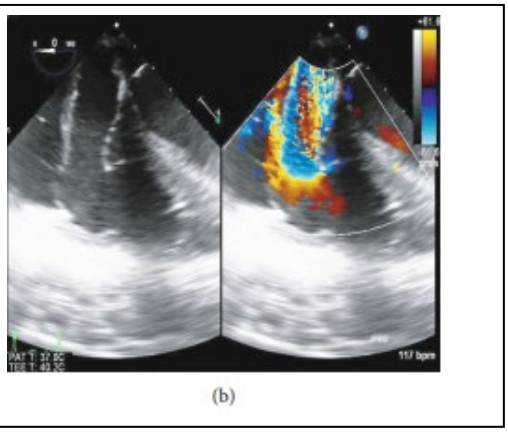
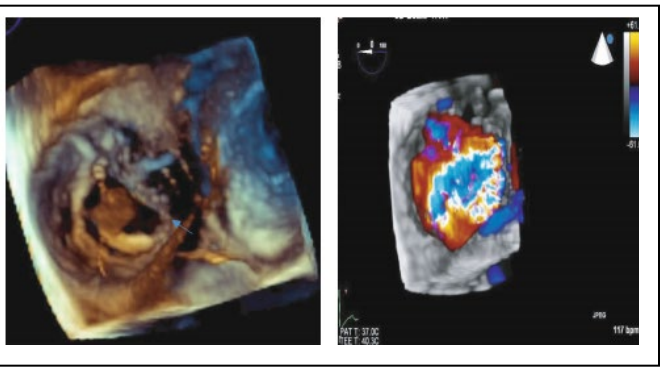
The colour flow Doppler revealed severe TR with an early peaking triangular jet velocity of 2.16 m/sec (b). There was systolic flow reversal in the hepatic veins. A 3D transoesophageal echocardiogram (TEE) was performed which confirmed a flail anterior TV leaflet due to rupture of the anterior papillary muscles. On 3D colour flow, the TR was severe, with the jet filling greater than 50% of the right atrium . The patient underwent a successful surgical repair of the TV . A flail anterior TV leaflet due to anterior papillary muscle rupture was identified with a residual papillary muscle stump on the RV. The anterior papillary muscle was reattached to the stump with pledgeted 4-0 polypropylene sutures. Additionally, a modified De Vega annuloplasty was done. Finally, the valve competency was tested by saline injection into the RV and confirmed by TEE after coming off cardiopulmonary bypass. Trivial TR was noted. The patient had an uneventful postoperative course.



(b)



Discussion:

MVA are a usually major cause of traumatic tricuspid regurgitation. In acute phase of blunt chest trauma, TR may often go undetected. Hence frequency of traumatic tricuspid insufficiency is probably underestimated. TR with flail leaflets is a serious and progressive disease , the early diagnosis of this disorder is very important.

TTE is a useful bedside tool for assessing cardiac structure and function in a trauma patient. It is validated tool for right heart, TV, and subvalvular apparatus assessment.

Transoesophageal echocardiography (TEE) can be utilised in cases if TTE provides insufficient information. Recently, more attention has been focused on 3- D imaging of the TV. It has "enface" views of the valve and thus easy discrimination of the 3 TV leaflets. Accurate anatomical information

aided in planning this TV repair by identifying the exact site anterior papillary muscle rupture. Early referral of patients with severe TR is advised to prevent right ventricular dysfunction from chronic volume overload.

Conclusion:

A successful TV repair was performed on traumatic papillary muscle rupture with TR

Reference:
Meel R et al. A Case of Severe Tricuspid Regurgitation Related to Traumatic Papillary Muscle Rupture. Case Reports in Cardiol .2020; 8505894: 1-5

3. Transfemoral Transcatheter Tricuspid Valve Replacement

A company has received FDA Breakthrough Device Designation for Transcatheter Tricuspid Valve Replacement System. Also received approval for an Early Feasibility Study of the device for tricuspid and mitral valve regurgitation indications.

A Cardiovalve transcatheter system is designed for treatment of mitral and tricuspid regurgitation by replacement of the native valves via a transfemoral approach.

By transfemoral procedure , it helps surgeons to offer a minimally-invasive alternative to open heart surgery or transapical delivery with mini-thoracotomy access.

The system is designed to provide significant benefits including minimal protrusion to the left or right ventricle that minimizes interference with the cardiac blood flow. It is also designed with an enhanced seal to prevent paravalvular leaks.

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Initial clinical results demonstrate high procedural success, and the first patients have had clinical benefit for more than two years.

Reference:
Available at : https://www.medgadget.com/2020/03/cardiovalve-wins-fda-breakthrough-device-designation-for-transcatheter-tricuspid-valve-replacement-system.html Accessed on 06-04-2020