

achieved MVA ≤ 1.5 sq cm and 10 patients developed at least moderate to severe MR. 6 patients were sent for emergent surgery due to leaflet tear (n=4) or severe commissural MR (n=2) with low output state. Of the patients sent for emergent surgery due to severe MR, calcium nodule /irregular thickening of leaflet were significant associations ($p < 0.001$). Higher grades of SVF correlated with higher pre-PTMC pulmonary pressures and portended a worse PTMC outcome. Using regression analysis and Pearson's rank relation, correlation coefficients for post-PTMC poorer outcomes were significantly stronger for higher grades of SUBVALVE DISEASE ($r = 0.76$) and LEAFLET NODULAR CALCIFICATION ($r = 0.72$) than the composite score ($r = 0.67$) as also the other two variables in the score (0.51 for M, 0.47 for T).

Conclusion: Presence of calcium nodules on mitral leaflets, irregular leaflet thickening of leaflets with thick/thin areas and presence of severe subvalve disease were more predictive of poorer outcomes of PTMC, than were mobility of valve or thickening as per Wilkins' scoring criteria. Among the above, worse subvalve disease related to poorer gain of area immediately post PTMC as well as higher residual gradients. Presence of calcium nodules on leaflet as well as irregular leaflet thickening were more predictive of give-way during balloon dilation and leaflet tear, leading to severe MR mandating immediate surgical intervention.

Correlation of serum Vitamin D levels with severity of rheumatic mitral valve calcification

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Background: Rheumatic mitral valve calcification (RMVC) is an active inflammatory process. Balance of pro and anticalcific factors in the local milieu of the valve determine its susceptibility to calcification. Vitamin D has been shown to have anti-inflammatory and anticalcific effects. Till date no study has assessed its levels in patients of RMVC compared to noncalcified rheumatic valves.

Aim: To assess serum Vitamin D level in patients of RMVC compared with non calcified valves and see correlation between serum Vitamin D level and severity of mitral valve calcification assessed by (TTE) transthoracic echocardiography (Wilkins calcium score WCS).

Method: 30 patients each of rheumatic mitral valve with no calcification (WCS 0, group 1), mild calcification (WCS 1 or 2, group 2) and severe calcification (WCS 3 or 4, group 3) have been studied (study is ongoing and 55 patients will be enrolled in each group). Serum calcium, phosphorus, alkaline phosphatase, parathormone and 25 OH vitamin D (immunoassay Elecsys 2010 Roche, Germany) were assessed.

Results: Mean age of three groups were similar (29.32 ± 9.8 in group 1, 31.68 ± 7.23 in group 2, 32.75 ± 9.83 in group 3, $p = NS$). Serum Ca, P, ALP, PTH, and ESR were also similar in all 3 groups ($p = NS$). Serum 25 OH vitamin D was significantly lower in group 3 (11.06 ± 3.85 ng/ml, $p < 0.001$ vs group 1) and group 2 (21.86 ± 8.49 ng/ml, $p < 0.001$ vs group 1) compared to group 1 (29.42 ± 9.4 ng/ml). A significant inverse correlation was identified between Vitamin D level and severity of calcification ($r = -0.79$, $p < 0.001$). Vitamin D level in non-calcified valves was near normal (normal value ≥ 30 ng/ml).

Conclusion: This is first study to show significant reduction in vitamin D level in patients with RMVC. Thus a link may exist between 25 OH vitamin D and calcification process in RMVC and supplementation of oral Vitamin D to maintain normal level may prevent or attenuate progressive valvular calcification.

Correlation of mitral valve area (MVA) with dyspnea in mitral stenosis

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Background: It is observed that in MS dyspnea may not always correlate with MVA. Study was carried out to access correlation of MVA with severity of dyspnea.

Methods: Two hundred cases of pure MS in NYHA class I to IV comprised material of this study. Detailed clinical evaluation followed by ECG, XRAY and ECHO were done in all cases.

Results: Correlation of NYHA class to MVA is as follows-

NYHA class MVA < 1sq.cm. MVA 1-1.5sq.cm MVA 1.5-2sq.cm. Tot

I (108)	2	8	98	108
II (56)	1	45	10	56
III (22)	2	16	4	22
IV (14)	10	2	2	14
Total	15	71	114	200

Disparity is observed between MVA and NYHA class of dyspnea. Left atrial (LA) compliance, pulmonary vascular resistance (PVR), stretchability of mitral valve ring play an important role. Thus NYHA class I dyspnea is observed in MVA less than 1 sq.cm. When LA wall is compliant whereas with mild MS, NYHA class III or IV dyspnea is observed if LA wall is non compliant.

Conclusions: It appears that dyspnea is not a reliable indicator of severity of MS.

Echocardiography as a basic criterion for diagnosis of rheumatic fever and rheumatic heart disease

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Background: To study the role of 2D Echo Doppler in diagnosis of Rheumatic fever and Rheumatic heart disease and to compare echocardiography as a diagnostic criteria compared to Jones Criteria of rheumatic fever (RF) and rheumatic heart disease (RHD).

Methods: There were 32 patients included in study and were followed over a period of one year from December 2011 to November 2012. Patients with any complaints related to criteria for diagnosis of rheumatic fever and rheumatic heart disease whether present or past were included and divided into two groups - Those with positive echocardiographic evidence of carditis in patients diagnosed as ARF and RHD and those without echocardiographic evidence of carditis in ARF and RHD. Those with clinical evidence of

valvular lesions and those with echocardiographic evidence of valvular lesions.

Results: Carditis was diagnosed clinically in 56% whereas 2D Echo Doppler done in all patients with suspicion of RF, RHD increased the sensitivity of detection of RF/Carditis to 90.6%. Also the specificity and positive predictive value of 2D Echo Doppler was 100%. In our study clinically only 25.5% patients were diagnosed to have different types of valvular lesions by auscultation and ECG against which 48% patients were diagnosed and proved by echocardiography to have RF & RHD.

Conclusion: Echocardiography increases yield of RF & RHD in patients with acute rheumatic fever (p value $>.0138$) and is also helpful in mixed valve lesions to determine severity of each lesion. Subclinical cases of RF can be picked up with Echo Doppler so that timely treatment and prevention can reduce morbidity and mortality.

Predictive value of D-dimer levels and tissue Doppler mitral annular systolic velocity for detection of left atrial appendage thrombus in patients with mitral stenosis

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Background: Left atrial appendage (LAA) thrombus is one of causative factor for thromboembolic events in patient with mitral stenosis (MS). Several biochemical and echocardiographic parameters have been suggested to predict the presence of LAA thrombus in these patients.

Aims: 1) To assess the predictive value of mitral annular systolic velocity (S-wave) and D-dimer for the detection of LAA thrombus in patients with MS in sinus rhythm (SR). 2) To correlate D-dimer levels with LAA spontaneous echo contrast (SEC) and LAA thrombus.

Methods: Total 59 patients with symptomatic MS in SR were evaluated by transthoracic and transesophageal echocardiography and divided into 2 groups. Patients with LAA thrombus ($n=7$) and without LAA thrombus ($n=52$). Plasma concentrations of the D-dimer were measured with Roche Cardiac reader in both the groups.

Results: Patient with LA/LAA thrombus had higher rates of heart failure than those without thrombus (28.57%, $p<0.01$). Thrombus group had significantly lower mitral annular S-wave velocities (7.42 ± 1.1 cm/s, Vs 10.78 ± 1.3 , $p<0.001$) and higher D-dimer levels (824 ± 258 Vs 270 ± 94 , $p<0.001$) than those without thrombus. The LAA late emptying velocity (Lev) showed significant positive correlation with S-wave ($r=0.54$, $p<0.0001$) and moderate to severe SEC ($r=0.44$, $p<0.001$) and a significant negative correlation with the D-dimer levels ($r=-0.45$, $P<0.0004$). Multivariate analysis revealed that D-dimer, LAA Lev, S-wave velocity were independent predictors of LAA thrombi. ROC analysis yielded an optimal D-dimer cutoff value of $400 \mu\text{g/L}$ for prediction of LAA thrombi with sensitivity of 87.5%, specificity of 94%, positive predictive value of 83% and negative predictive value of 95% while S wave of 8 cm/s predicted LAA thrombus with sensitivity of 84.6%, specificity of 71.4% and positive predictive value of 50% and negative predictive value of 93.3%.

Conclusions: D-dimer and S wave velocity are independent predictors of LAA thrombus in MS patients with SR. Both have higher negative predictive values.

N-Terminal-proBNP [NT-proBNP], a surrogate biomarker of combined clinical and hemodynamic outcomes following PTMC

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Background: Natriuretic peptides (NP) have been evaluated in the setting of valvular heart diseases. This present study is designed to examine the relationship between plasma levels of NT-proBNP and various echocardiographic, hemodynamic parameters in patients with MS undergoing PTMC.

Methods: The study population consisted of 100 patients with rheumatic MS who underwent PTMC between June 2012 and November 2013. 2 ml of blood sample was collected by venipuncture into heparinised tubes 30 min before and 48 h after PTMC.

Results: Most of the study population were females. The male to female ratio was 19 : 81. Mean age of the study population was 37.5 ± 11 years ranging between 13 - 63 years. On correlation with various echocardiographic parameters, it was observed that log NT-proBNP correlated significantly with LA volume ($r=0.38$; $p<0.01$) and LAVI ($r=0.45$; $p<0.01$). On correlation with various hemodynamic parameters, it was observed that log NT-proBNP showed significant correlation with systolic PA pressures ($r=0.42$; $p<0.01$) and mean PA pressures ($r=0.41$; $p<0.01$).

Ninety two patients underwent successful PTMC. Four patients developed moderate - severe mitral regurgitation (MR) and four others developed AF (lasting >24 hours) following PTMC. NT-proBNP levels decreased significantly following PTMC ($p<0.01$). A significant decrease in NT-proBNP levels was observed both in patients with AF ($p<0.05$) and also in those with SR ($p<0.01$) (Table 6).

Conclusions: This present study demonstrated that NT-proBNP levels were significantly elevated in patients with severe MS. NT proBNP levels decreased significantly following PTMC along with improvement in various echocardiographic and hemodynamic parameters. Decrease in NT-proBNP levels following PTMC correlated with decrease in LA volume, LAVI, systolic PA pressures and mean PA pressures.

Calculation of Time in Therapeutic Range (TTR) in valve clinic follow up patients with mechanical heart valve replacement

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Background: High quality lifelong oral anticoagulation (LOAC) therapy after valve replacement using a mechanical valve is necessary for prevention of thromboembolism and hemorrhagic complications. One quality measure of anticoagulation management is analyzing individual time in therapeutic range (TTR), but still there are no studies about optimal TTR value in mechanical heart valve patients. This study was selected to analyze role of TTR in LOAC therapy receiving mechanical heart valve patients.

Aims: To calculate and to correlate TTR with a) prosthetic valve thrombosis (PVT), b) cerebral embolism (CE), total embolic events (TEE), c) major-moderate bleeding events (MBE), total bleeding events (TBE) in patients with mechanical prosthetic valves.