


Original Research Article

Clinical symptomatology in patients diagnosed with mitral valve prolapse

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Abstract

Background: Mitral valve prolapsed (MVP) is generally understood to be the systolic displacement of an abnormally thickened, redundant mitral leaflet into the left atrium during systole. This valvular abnormality has been associated with mid-systolic clicks, late systolic murmurs, and serious complications such as bacterial endocarditis, severe mitral regurgitation, and sudden death.

Aim and objectives: To assess the correlation between clinical symptomatology, ECG findings, and ECHO in diagnosing MVP and to help in early diagnosis of MVP and prevention of complications like bacterial endocarditis, etc. commonly associated with MVP and valve repair.

Materials and methods: The study consisted of 30 patients diagnosed with mitral valve prolapse who were attending General Medicine OPD at Rajah Muthiah Medical College & Hospital, Annamalai University, Chidambaram, Cuddalore District at the year 2018 (July -October over 4 months) were included in the study. Written Informed consent was taken from each patient and studied according to proforma. The diagnosis was based on three criteria i.e. clinical symptomatology, electrocardiogram, and echocardiography interpretations. All the values were statistically compared to determine the correlation between these three parameters in predicting the diagnosis.

Results: A total of 30 patients who presented with MVP were studied. The majority of them were in the age group of 21-40 (40%) followed by 41-60 (36.7%). Males reported a higher prevalence of 53.3% compared to 46.7% in females. BMI was normal in 86.7% of people as compared to 13.3% with abnormal BMI. ECG also showed normal sinus rhythm in 76.7% cases as compared to the remaining cases where in ECG showed ST-T changes. None of the patients sampled had any history of clinical symptoms associated with MVP. None of the patients had any congenital anomalies associated.

Conclusion: Clinical symptomatology and ECG by themselves can't be used as definitive diagnostic aids for MVP. Currently, echocardiography is the gold standard for diagnosis of MVP. Early

repolarization in ECG presented as a notch in descending arm of QRS and/or ST-segment or J-point elevation is more frequent in young patients with MVP syndrome.

Key words

Mitral valve prolapse, Clinical Symptomatology, ECG, 2D ECHO.

Introduction

Venous thromboembolism (VTE) is a frequent cause of preventable illness and death in hospitalized patients. 25% of all cases of venous thromboembolism are associated with hospitalization and 50 to 75% of cases of VTE in hospitalized patients occur on those in medical wards. In general, detection of deep vein thrombosis (DVT) in hospitalized patients not on thromboprophylaxis by venography is 10.5% to 14.9% and by ultrasound venous Doppler is 5% [1]. Thrombosis was asymptomatic in 70% of cases. Pulmonary embolism occurred in 0.3 to 1.5% of cases and proximal DVT in 2 to 4.9%. PE accounts for 5 to 10% of deaths in hospitalized patients [2]. In One meta-analysis of four studies of 5256 patients with DVT as the end point and 5 studies of 7355 patients with death as the end point and 9 studies of 19,958 patients with pulmonary embolism as an end point, anticoagulation decreased the relative risk of pulmonary embolism (0.43; 95% CI 0.26-0.71) and fatal pulmonary embolism (0.38; 95% CI 0.21-0.69) and non-significant relative risk of DVT (0.47; 95% CI 0.77–1.00) with no effect on overall mortality and a non-significant increase in relative risk of bleed (1.32; 95% CI 0.73 to 2.37). Three randomized control trials with Enoxaparin (MEDENOX) $p < 0.001$, the prospective evaluation of Dalteparin efficacy for prevention of VTE in immobilized patients' trial (PREVENT) $p = 0.002$, Arixtra for thromboembolism prevention in medical indication study (ARTEMIS) $p = 0.03$ using fondaparinux were done to assess the use of anticoagulation routinely in all immobilized patients [3]. The end point was the presence of asymptomatic distal thrombi diagnosed using screening venography. The presence of DVT was found in 60% of the stroke patients thus stressing the use of routine anticoagulation in patients with

extremity paresis or paralysis. Analysis of data from IST, international stroke trial allows a comparison of the effect of medium-dose heparin (12,500 U of UFH twice daily) initiated within 48 hrs of ischemic stroke and continued for two weeks to no heparin on several endpoints. Although this dosing regimen reduced the risk of PE and recurrent ischemic stroke the reduction was more than offset by an increased risk of hemorrhagic transformation and extra-cranial hemorrhage [4].

Overall there was an increased risk of death and or recurrent stroke and major non-fatal extracranial bleeds of 0.5% and 1.5% respectively during the treatment period. White, et al. studied the risk of warfarin-related complications in 22,000 unselected groups with a subgroup of 1312 patients with history of stroke, the readmission rate due to bleeding was 1.7%. The excess risk of intracranial hemorrhage in this subgroup was not specifically studied, though it was 0.1% in the group as a whole [5]. There is strong evidence from well-conducted clinical trials that anticoagulation prophylaxis reduces the risk of asymptomatic DVT and proximal DVT. Less information is available regarding effects on improved outcomes in terms of fatal and non-fatal pulmonary embolism [6]. Because entry into trials is mainly by patients in a high-risk group less information is available in a general hospital population. Further, trials are mostly done on surgical patients the end in formation cannot be applied to patients in general medical wards with co-morbid conditions and especially stroke patients where the risk of bleeding should be weighed against prophylaxis for thromboembolism [7].

Materials and methods

The study consisted of 30 patients diagnosed with mitral valve prolapse who were attending General Medicine, OPD at Rajah Muthiah Medical College & Hospital, Annamalai University, Chidambaram, Cuddalore District at the year 2018 (July-October over 4 months) were included in the study. Written Informed consent was taken from each patient and studied according to proforma. The diagnosis was based on three criteria i.e. clinical symptomatology, electrocardiogram, and echocardiography interpretations. All the values were statistically compared to determine the correlation between these three parameters in predicting the diagnosis.

Inclusion criteria:

- Patients with acute stroke of fewer than two weeks duration.
- Recovery of power from admission till the end of study period less than 3/5.
- Patients with or without a known history of diabetes mellitus, systemic hypertension.
- Patients with risk for accelerated atherogenesis such as smoking or alcoholism.

Exclusion criteria:

- Duration of stroke more than two weeks.
- Recovery of power from the time of admission to screening for DVT is more than 3/5.
- Pregnancy.
- Patients on treatment with drugs like aspirin, OCPs, or anticoagulants.
- Patients with underlying procoagulant states previously known.
- Patients with underlying connective tissue diseases.

All patients admitted with c/o acute stroke of fewer than two weeks in our hospital were screened preliminarily with a proforma to assess the presence of predisposing conditions of CVA like diabetes, systemic hypertension, ischemic heart disease, and valvular heart diseases. Also,

patients were specifically questioned on their medications which could affect coagulation as well as any history of addictions. A detailed physical examination was done. Basic investigations like CBC, Random blood sugar, Serum fasting lipid profile, and ECG were taken for all patients included in the study. CT brain was also done. Evaluation of the cardiovascular system with echocardiography was done. The patients were examined and their improvement with regards to general physical condition, control of blood pressure, and improvement in neurological status with special attention to the recovery of tone and power was assessed daily. Signs and symptoms for the development of DVT were specifically looked for. Patients with Diabetes, ischemic heart disease, and other underlying diseases were treated for their respective diseases in addition to receiving anti-edema measures, antibiotics, and anti-ulcer drugs as well as aspirin in recommended dose for patients with ischemic stroke. Physiotherapy to the paralyzed limb was started as early as day 1 of admission and patients and their caregivers were encouraged to continue it all through their hospital stay. Patients with persistent hypotonia and power < 3/5 at the end of 14 days were screened for the presence of DVT of the paralyzed limb with ultrasound venous color flow Doppler on day of admission and day 14 and the results were documented. Patients who had developed DVT despite intensive physiotherapy were treated with leg elevation, graded compressive stockings, and LMWHs. They were followed up during the entire course of hospital stay with repeated USG venous Doppler.

Statistical analysis

Statistical analysis was carried for 50 subjects. Age, presence of diabetes, systemic hypertension, ischemic heart disease, smoking, and alcoholism in the DVT positive and negative group were analyzed. The statistical significance was calculated using the chi-square test. Statistical significance was taken when p-value <0.05. Statistical analyses were carried out using standard formulae. Microsoft excel 2017 and

SPSS (statistical package for social sciences) version 13.0 softwares were used for data entry and analysis.

Results

We included 50 patients with acute stroke in our study and all of them had venous Doppler done for the lower limb venous system.

In our study, the prevalence of DVT in acute stroke was analyzed by ultrasound venous Doppler of lower limbs. The analysis of co-morbid conditions like diabetes, systemic hypertension, ischemic heart disease, smoking, and alcoholism was analyzed to find out if there was any association between their presence and the occurrence of DVT. In all these parameters compared within the group of DVT-positive patients, the p-value was more than 0.05 which is statistically insignificant. The important

observations noted in the study were: The prevalence of DVT was found in 6% of Stroke Patients. The prevalence of DVT was found more commonly in women than in men. The occurrence of DVT in acute stroke is independent of the presence of co-morbid conditions like diabetes, systemic hypertension, ischemic heart disease, and high-risk behaviors like smoking and alcoholism. ECG abnormalities are known to occur in a third of pts with mitral valve prolapse. The most commonly reported ones are ST-T segment changes and II III AvF inversions which are commonly mistaken for ischemic changes. VPC's have been reported slightly less frequently as also episodes of SVT. In our study, most of the patients had a normal sinus rhythm ECG with only 4 pts ECG s showing ST-T changes and 1 pt showing VPC's. Rest of the majority of patients had a normal sinus rhythm ECG pattern (**Table – to 6**).

Table - 1: Prevalence of DVT in acute stroke patients.

Total number of patients in whom venous doppler was done	DVT positive	Percentage
50	3	6%

Table – 2: Patient characteristics.

Characteristics	Present (No)	%	Absent (No)	%
DM	9	18	41	82
SHT	15	30	35	70
IHD	2	4	48	96
Smoking	22	44	28	56
Alcoholism	14	28	36	72

Table – 3: CT findings.

CT	Number	%
Infarct	42	84
Hemorrhage	8	16
Total	50	100

Table – 4: Risk factor analysis in DVT positive patients.

DM	DVT present	DVT absent	Total
Present	0	9	9
Absent	3	38	41
Total	3	47	50

Table – 5: IHD vs DVT.

IHD	DVT present	DVT absent	Total
Present	0	2	2
Absent	3	45	48
Total	3	47	50

Table - 6: ECG findings.

ECG	Number of pts	Percentage
Normal sinus rhythm	23	76.7%
Sinus bradycardia	1	3.3%
Sinus tachycardia	1	3.3%
ST depression in IIIIaVF	2	6.7%
T wave inversion in I II	1	3.3%
T wave inversion in III	1	3.3%
VPC	1	3.3%
Total	30	100%

Discussion

The prevalence of DVT in patients with acute stroke admitted in to our hospital is found to be 6% as against a prevalence of 60% reported in western literature. The exact cause for this discrepancy is not known but there does seem to be a difference in the occurrence of DVT in different ethnic groups as revealed by studies [8]. The incidence of post-op DVT in Europe is twice that of North America, similarly autopsy series showed the prevalence of thromboembolism is 40.6% in Boston and 13.9% in Kyushu, Japan. This may probably be explained due to regional variation in underlying medical conditions or true variation in genetic and environmental factors [9]. There are also studies published reporting increases in the incidence of DVT with age. In the elderly probably there is an increase in several thrombotic risk factors or there exists an acquired thrombotic state, with anatomic changes in soleal veins with more pronounced stasis in valve pockets [10]. The prevalence of DVT both asymptomatic and symptomatic in acute stroke patients in our hospital was only 6% and the exact occurrence of pulmonary embolism in these patients is not known. Though there are widely conducted trials in the west on routine prophylaxis of DVT with anticoagulants as early as day 2 of stroke, such studies are not available in the Indian population and the data from the

west cannot be extrapolated to our population as the prevalence of DVT is found to be very low and the majority are asymptomatic [11]. The mortality and morbidity rate of patients with acute stroke in our study population was not significantly affected by withholding routine anticoagulation therapy. The risk associated with anticoagulation in acute stroke should also be taken into consideration. In the IST, treatment with low dose unfractionated heparin (5000 U s.c. twice daily) significantly reduced death and recurrent stroke at 14 days from 12 to 10.8%, a benefit attributable to decreased risk of recurrent ischemic stroke as PE was not reduced [12]. There was also an increased risk of hemorrhagic transformation and extra-cranial bleeds. The balance of risks might therefore favor initiation of anticoagulation treatment in established venous thromboembolism after stroke, where the risks of untreated VTE are high and mortality is proven to be reduced with anticoagulation therapy [13]. The routine prophylaxis for patients with asymptomatic below knee DVT is still controversial and more studies are recommended before the benefits could be conclusively established [14]. Physiotherapy and mechanical anticoagulation with graded compressive stockings can be considered as the initial line of prophylaxis as there is no increased risk of bleeding. The sensitivity of duplex sonography in

detecting DVT is 97% and it is a simple, non-invasive reliable tool that can be done as early as day two and serial follow-up can be done as and when required. The treatment of DVT can be initiated as soon as it is detected as the risk of PE is only by three to four weeks after stroke [15].

Conclusions

The prevalence of DVT in acute stroke patients in our hospital group was 6% which is significantly less than that observed in the western population. Duplex USG is a useful tool that can be used as a screening tool for the early diagnosis of DVT. DVT occurs more commonly in paralyzed limbs than non-paralyzed limbs. The presence of co-morbid conditions like diabetes, SHT, IHD, smoking, and alcoholism does not affect the occurrence of DVT in acute stroke thus it is an independent contributor to morbidity and mortality in stroke patients. The use of routine anticoagulation in all stroke patients in our population requires further large-scale trials before their benefits could be conclusively proven.

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