**860**

Is transesophageal echocardiography helpful in patients with stroke?


**Introduction:** Embolism within the central nervous system is a frequent cause of stroke. Transesophageal echocardiography (TEE) enables detection of its potential sources. It is not clear however whether TEE is helpful in all patients with stroke. The following study is an analysis of TEE being used on patients with stroke, examined in our echocardiography laboratory.

**Methods:** We selected all patients with stroke from an echocardiography database, who were examined by TEE in the 1nd Department of Internal Medicine. We evaluated the presence of intracardial thrombosis, spontaneous echocurtact, size of left atrium, speed of left auricular emptying, presence of patent foramen ovale (PFO) or atrial septal defect (ASD) and plaques in aorta. We compared patients with stroke to a controlled group consisting of patients examined by TEE from other indications. Excluded from both groups were patients with atrial fibrillation since it is an obvious to a controlled group consisting of patients examined by TEE from other indications.

**Results:** From November 2000 to April 2003 we examined 69 patients with stroke and 221 controls. Intracardial thrombosis were present in 4 (5.8%) of patients and in 12 (5.4%) of controls. Spontaneous echocontrast was found in 19 (27.5%) of patients, resp. 44 (19.9%) controls. Low left auricular emptying was found in 10 (14.5%) of patients and 26 (12.0%) controls. ASD or PFO was found in 15 (21.7%) of patients and 26 (12.0%) controls. Simultaneous finding of ASD or PFO and atrial septal aneurysm was observed in 7 (10.1%) of patients and 18 (8.1%) controls. The differences were not statistically significant (p > 0.05). 45 (65.2%) patients and 111 (51.3%) controls had plaques in aorta; 29 (42.0%), resp. 22 (10.0%) of the controls.

**Conclusion:** We found a trend of more frequent spontaneous echocontrast and low left auricular emptying and statistically significant difference in occurrence of atherosclerotic plaques for patients with stroke. We have not found a more frequent intracardial thrombosis or ASD or PFO.

TEE is a safe method for discovering the potential source of embolism. However, the indication of TEE in patients with stroke should be carefully considered, since other factors such as the impact on therapy and cost-effectiveness should be taken into account.

**SOURCE OF EMBOLISM**

**862**

Evaluation of echocardiographic risk factors for thromboembolism in patients with paroxysmal atrial fibrillation.


**Introduction:** Chronic Atrial Fibrillation (cAF) is correlated with thromboembolic complications. On the other hand, the role of paroxysmal Atrial Fibrillation (pAF) in thromboembolism is not known over the long term. In patients (pts) with cAF, the dilation of left atrium (LA), the systolic dysfunction of left ventricle (LV), the low velocity flow through the left atrial appendage (LAA) and the spontaneous echocontrast (SEC) in LA and LAA the atheromatous plaques in thoracic aorta (THA) and mainly the detection of thrombus in LA and LAA are echocardiographic risk factors for thromboembolic complications. We sought to evaluate the aforementioned echocardiographic risk factors in pts with pAF.

**Methods:** We evaluated 36 pts 66±15 years old (19M, 17F) with history of pAF. Study pts were considered those without moderate or severe mitral valve regurgitation or rheumatic heart disease. All pts underwent a thorough transthoracic and transesophageal echocardiographic examination. We evaluated the ejection fraction (EF) of LV, the dimension of LA, the flow velocity in the LAA, the presence of SEC in LA (little or significant degree) and finally the presence of atheromatous plaques into thoracic aorta. All the pts were in sinus rhythm during their echocardiographic examination, without antiaggregative treatment.

**Results:** Dilated left atrium (> 40 mm) was found in 16/36 (44%) pts, SEC was found in 25/36 (69%) pts [20/36 (55%) little and 5/36 (14%) significant degree], the flow velocity in the LAA was > 20 cm/sec in 32/36 pts (89%) and in 4 (11%) of them was > 30 cm/sec and atheromatous plaques in THA was found in 14/36 (39%) pts and none had thrombus in LA and LAA. Finally, EF < 45% was found in 7/36 (19%) pts. In 9 to 31 months follow up one pt with history of pAF died suddenly by unknown cause which had big LA and significant SEC.

**Conclusions:** In this preliminary study, little spontaneous echocontrast in the LA was present in most of the pts with history of pAF, the LA was found dilated and atherosclerotic disease of THA was present in many pts. Low flow velocity in the LAA was not a common finding. The predictive value of these echocardiographic risk factors for thromboembolism does seem to be valid in pts with pAF. It has to be proven by adequate studies.

**863**

Poliparametric functional evaluation of left atrial appendage obtained with transesophageal echocardiography: comparison with transesophageal echocardioigraphy.

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Transesophageal echocardiography (TEE) is the gold standard to evaluate the left atrial appendage (LAA) function, useful for anticoagulation therapy in cardioverting patients with atrial fibrillation (AF).

**Aim of this study is to evaluate the feasibility of a poliparametric evaluation of LAA at its harmonic transesophageal echocardiography (TTE) with LAA emptying velocities (vel) plus a completely new monodimensional parameter of LAA contraction, and to test the accuracy versus the TEE LAA vel.**

**Method:** We studied 75 patients (39 in sinus rhythm and 36 in AF), measuring LAA vel at TEE. Prior to TEE, we performed an harmonic TTE, determining 1) the TTE LAA vel and 2) the TTE M-mode LAA medial wall thickening (D), related to the emptying and filling LAA phases.

**Results:** We obtained an adequate visualization of TTE LAA vel in 60/75 patients (80%) and of TEE LAA vel in 71/75 patients (95%). A good correlation was observed between TTE LAA vel and TEE LAA vel (n=0.87, p<0.0001). A cutoff value of TEE Auv < 0.30 cm/s showed a sensitivity of 85% (11/13 patients) and a specificity of 95% (20/21 patients) in identifying patients with a TEE Auv <30cm/s. A cutoff value of D <0.25 cm showed a sensitivity of 94% (29/31 patients) and a specificity of 83% (33/40 patients) in identifying patients with a TEE Auv <30cm/s.

**Conclusion:** Flow and M-mode parameters, thanks to their feasibility, can be useful to evaluate LAA function with II harmonic TTE. This information could be useful for anticoagulation therapy of AF patients.

**864**

A new sign of left atrial appendage function obtained with monodimensional transthoracic and harmonic transesophageal echocardiography.

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In the study of left atrial appendage (LAA) function during sinus rhythm (SR) and atrial fibrillation (AF) for anticoagulation therapy indication, the gold standard to measure LAA emptying velocity (LAAV) is transesophageal echocardiography (TEE). Conversely, conventional transesophageal echocardiography (TTE) LAA study has been poorly feasible. The aim of this study is to evaluate the feasibility of a new TTE monodimensional parameter of LAA function and to compare it with TEE LAAV.

**Method:** In 75 patients, 39 with SR and 36 with AF enrolled for DC-shock cardioversion (C), we performed TTE and TEE to study LAA function. With 2nd harmonic TTE in modified apical 2 chamber view, using a single M-mode beam perpendicular to LAA wall, we determined the extent of LAA medial wall thickening (D), also related to the LAA contraction and relaxation phases. We considered a D > 0.25 cm as a sign of normal LAA function.

**Results:** The LAA was visualized with M-mode 2 harmonic TTE in 71/75 patients (95%); in all the patients LAAV were obtained by TEE. In these 71 patients there was a good correlation between TTE D and TEE LAAV (n=0.54, p<0.001). A value of TTE D <0.25 cm showed a sensitivity of 94% (29/31 patients) and a specificity of 85% (34/40 patients) in identifying patients with a TEE LAAV <30cm/s. In the 4 patients showing a LAAV <30 cm/sec at 24 hours post-C (mean LAAV 22±5.1 cm/sec), the TTE D was 0.39±0.11 cm at pre-C, 0.16±0.09 cm (p<0.05 vs pre-C) at 24 hours post-C, and 0.34±0.12 cm (p<0.05 vs 24 hours post-C) at 7 days post-C (when the TEE LAAV increased to 48±11.6 cm/sec, p<0.05 vs 24 hours post-C).

**Conclusion:** Our data indicate that this new TTE 2 harmonic M-mode parameter is easily obtainable, can provide information related to TEE LAAV and could be useful in AF patients for post-C anticoagulation therapy.