

Clinical impact of transoesophageal echocardiography in acute brain ischaemia: who should we select?

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Background: Stroke is a prevalent disease and is still the leading cause of death in Portugal. Transoesophageal echocardiography (TOE) is a sensitive test often performed to detect embolic sources. However, since its most common findings such as patent foramen ovale (PFO) and atheroma plaques do not necessarily mandate a change in treatment, there is still debate over its clinical impact in the context of brain ischaemia (BI) and which patients (pts) should be submitted to it.

Purpose: To assess the clinical impact of TOE following BI and to identify clinical and diagnostic testing results that could help predict which pts benefit from it.

Methods: A retrospective study was conducted including all pts submitted to TOE in our hospital after acute BI in 2018 and 2019. Clinical and testing data (brain, vascular and cardiac imaging and 24h-Holter monitoring) was analysed and compared between 2 groups: the pts who had findings in TOE compatible with a source of embolism which resulted in a change in treatment ("relevant TOE" group) vs all other pts who had no such findings or whose findings did not result in change in treatment ("others"). Predictors of relevant TOE were also analysed.

Results: Of the 87 pts (mean age of 57 and maximum of 83) included in the study, 51 (59%) had findings compatible with a potential source of embolism in TOE, PFO being the most common (n = 42). In only half of them did these findings result in a change in treatment (the relevant TOE group: n = 25; 29% of the overall population).

Age and other baseline characteristics did not significantly differ between groups. Pts with a relevant TOE presented more often with visual-field defects (32% vs 10%, $p = 0.020$) and were more likely to have visible acute lesions on brain imaging (96% vs 76%, $p = 0.032$) compared with the others. There was also a borderline significant association between the presence of infarct in the territory of the superior cerebellar artery and a relevant TOE ($p = 0.054$). On the contrary, the presence of significant lesions in extracranial arteries was negatively associated with a relevant TOE ($p = 0.016$).

Considering the whole population, there were no transthoracic echocardiography (TTE) predictors of a relevant TOE but when analysing only younger patients (age < 50), the presence of any abnormality in TTE became associated with a relevant TOE (OR 8.5, CI 1.1-63.9; $p = 0.044$). We found no predictors of relevant TOE in 24h-Holter results.

Conclusions: TOE commonly identified potential sources of brain embolism, which proved relevant in half the cases. In the impossibility of submitting all BI patients to TOE, this study suggests that brain and vascular imaging rather than age or other baseline characteristics may be useful in predicting a relevant result. Moreover, TTE does not seem to be an adequate screening method to select patients for TOE, except possibly in younger patients. Studies with larger samples are needed to confirm these results.