

CHARACTERISTICS OF MIGRAINE PATIENTS WITH SIGNIFICANT RIGHT TO LEFT SHUNTS AS DETERMINED BY TRANSCRANIAL DOPPLER.

Sponsor: Ryan Headache Center

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Abstract

Objective: To determine which characteristics reliably predict a significant right-to-left shunt (RLS) in patients attending a headache specialty practice undergoing transcranial doppler examination (TCD).__

Design: Retrospective chart review of patients who underwent a TCD examination to screen for RLS presumably due to Patent Foramen Ovale (PFO).

Patient Selection: All patients who had a TCD performed in our headache clinic (April 2006 – September 2007). All TCD's performed by the same physician in standardized fashion using agitated saline contrast (rest and after valsalva) and graded on 0 – 5 scale. (1). A grade of ≥ 3 was considered significant (++ RLS). Grade 1 or 2 are technically positive but less significant (+RLS) while grade 0 is a negative result (- RLS).

Main Outcomes Measures: Demographics and headache characteristics (with or without aura), type and frequency of aura, findings of microvascular infarcts or white matter lesions on MRI, family history of migraine, stroke, PFO and hormonal contraceptive use were recorded. Chi-square analysis was performed with a significance level at 0.05.

Results: 42 patients with migraine, 21 with (MWA) and 21 without aura (MOA), mean age 39 years, 95% female. 15 ++RLS, 11 of which underwent echocardiography (TEE and/or TTE). 8 had confirmed PFO, 3 had negative echocardiography (TEE and/or TTE) and 4 declined further study. All 3 patients with negative echo were subsequently confirmed PFO during cardiac catheterization.

++RLS was detected more often after valsalva maneuver than at rest, regardless of aura status. A family history of migraine and also PFO were significantly more common in those with ++RLS (94% and 24% respectively). Abnormal MRI was more common in ++RLS than +RLS and – RLS but did not reach significance (70%, 40%, 57% respectively). Interestingly, in ++RLS the presence of a non-visual aura was significant less likely than in – RLS (6% vs 23%). Visual aura was increasingly more common as the severity of the RLS increased but did not reach significance.

Conclusions: TCD is a useful screening test for RLS presumably due to PFO, but an adequate valsalva maneuver is necessary to detect significant shunts (the lack of which may explain false negative TEE's). All patients with ++RLS who underwent additional evaluation were confirmed to have PFO. Abnormal MRI is more predictive of a positive RLS than the presence or absence of aura. The presence of non-visual aura was surprisingly less common in those with ++ RLS. The small sample size and retrospective design limit any generalizations. More study is warranted in order to formulate clinical recommendations as to which patients should undergo TCD.

1. Spencer MP, et al. Power Mode TCD for Diagnosis of PFO and Assessing Transcatheter Closure. *Am Soc Neuroimaging* 2004; 342-349.