

Patent Foramen Ovale Closure: Opportunity Closed in Old Patients?

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Recent randomized trials have demonstrated the benefit of patent foramen ovale (PFO) closure for secondary stroke prevention in patients with high-risk PFO.¹⁻³ Since these trials exclusively enrolled patients aged ≤ 60 years, the current American Academy of Neurology guideline recommends PFO closure in stroke patients who are < 60 years old.⁴ Does this mean that PFO closure should not be advised for patients ≥ 60 years old? Importantly, although the guideline mentions an age limitation, there have been no reports of inefficiency or adverse effects of PFO closure in older patients. Previous studies excluded old patients because older patients compared with younger patients are more likely to have other undetected etiologies such as covert atrial fibrillation (AF), hidden malignancy, or aortic atheroma.⁵

The presence of the so-called risk of paradoxical embolism (RoPE) score has added confusion; some argue that older patients should be excluded from PFO closure because they have low RoPE scores. However, this approach does not appear to be logical because the RoPE score was primarily developed to estimate an individualized probability of the causal relation of PFO to stroke in young patients with cryptogenic stroke.⁶ The RoPE score is naturally low in older patients simply because they are old and tend to have vascular risk factors. Studies have shown that older patients with PFO more often develop future stroke than their young counterparts.⁷ Aside from the possible presence of covert AF or greater PFO sizes, older patients are more likely to have venous thrombosis and pulmonary hypertension that potentially increase the risk of PFO-related stroke.

Device Closure Versus Medical Therapy for Cryptogenic Stroke Patients With High-Risk Patent Foramen Ovale (DEFENSE-PFO) is one of the major randomized trials that showed

the benefit of PFO closure in stroke patients with high-risk PFO. In contrast to the other studies, this trial had no age limitations. In this issue of the *Journal of Stroke*, Kwon et al.⁸ presented the subgroup analysis data of DEFENSE-PFO, which included the benefit of PFO in the patients with aged ≥ 60 years. Of patients randomized to medical treatment, the 2-year risk of ischemic stroke or transient ischemic stroke (TIA) in the old (≥ 60 years) patients was quite high as 24.6%, while it was 5.8% in the young (< 60 years) patients. Most recurrent events were ischemic strokes, and all the ischemic strokes were considered as PFO-related strokes. There was no recurrent ischemic stroke or TIA in patients who received PFO closure. Accordingly, the benefit of PFO closure looks greater in patients ≥ 60 years than in those < 60 years despite no clear evidence of treatment-by-age interaction. In this study, the higher event rate in elderly patients was not attributed to characteristics of PFO features because the trial initially enrolled patients with high-risk PFO only.

The results of this study should be interpreted with caution because of the small outcome events and an inadequate statistical power. Thus, the age limitation in the guidelines will not be changed until future large randomized trials confirm this preliminary result. Nevertheless, this paper intriguingly suggests that PFO closure may be considered in carefully selected old patients who have high-risk PFO.

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