**Paradoxical Embolism as a Principal Cause of Stroke in Atrial Septal Aneurysm**

*To the Editor:*

The report from the Stroke Prevention: Assessment of Risk in a Community (SPARC) study\(^1\) stating that atrial septal aneurysm (ASA) is associated with an increased risk of stroke is important for 2 reasons. (1) It definitively establishes the prevalence of ASA in the general population at 2.2%. The true prevalence of ASA was underestimated before the routine use of echocardiography, especially transesophageal echocardiography.\(^2\) (2) It supports the previous conjecture that paradoxical embolism is the predominant mechanism of cardioembolism in ASA.\(^3\)

Although 2 previous multicenter studies\(^4,5\) suggested paradoxical embolism as a possibility among several other mechanisms, including thrombus formation in the ASA, associated mitral valve prolapse, associated mitral stenosis, and supraventricular tachyarrhythmias, this study was the first to prove conclusively that paradoxical embolism is the principal mechanism for stroke in patients with ASA. This has obvious and important therapeutic implications.

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**Response**

We appreciate Dr Cheng’s interest in the Stroke Prevention: Assessment of Risk in a Community (SPARC) study and the recent application of its data in establishing the role of atrial septal aneurysm (ASA) as a source of cardioembolism.\(^1\) A major contribution of the SPARC study is the definition of the prevalence of various cardiac pathologies (eg, ASA) in a large representative sample of the population, as determined by transesophageal echocardiography (TEE). The frequency of ASA observed in the SPARC population (2.2%) was similar to the frequency found in a large autopsy study\(^2\) but lower than that in previously reported TEE studies.\(^3\) These differences are related to the nature of the SPARC population (a large, random sample of the Olmsted County population), as well as to the rigorous definition of ASA\(^4\) and the blinded review of the echocardiographic studies by multiple observers in our study.

Previous studies assessing the role of ASA as a cardiac source of embolism have compared the frequency of ASA in patients undergoing TEE after embolic events to its frequency in patients undergoing TEE for other clinical indications (serving as controls).\(^3\) These control groups were highly prone to selection bias because of study design. By contrast, the SPARC study uniquely enabled us to select an appropriate control population, matched by age and sex to the group of patients undergoing TEE after a cerebral ischemic event. Comparison of the 2 study groups confirmed the association between ASA and cerebral ischemic events. ASA was strongly associated with right-to-left interatrial shunting. An interatrial shunt was the only source of embolism in the majority of patients, suggesting that paradoxical embolism is the major mechanism of ASA-related embolic events. Additional studies are necessary to determine the optimal treatment strategies (secondary prevention and, possibly, primary prevention) for patients with ASA.

In summary, the SPARC study is the first study establishing the prevalence of various cardiac sources of embolism in a large population-based cohort. Data from SPARC should serve as the reference to which patient populations are compared, as was done in our study on ASA.

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