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Multifactorial Bases of Stroke After Cardiac Surgery

To the Editor:

We read with great interest the article by Gottesman et al¹ dealing with one of the most devastating complications of cardiac surgery, perioperative stroke. The article analyzed the impact on outcomes of watershed stroke and the role of intraoperative hypoperfusion on its onset. Nevertheless, their report raises some concerns.

The authors pointed out that hypoperfusion is an independent predictor of bilateral watershed strokes, a drop in mean arterial pressure of at least 10 mm Hg being associated with a 4-time increased adjusted risk of watershed strokes. The study group was composed of patients who developed postoperative stroke whereas patients who underwent cardiac surgery without developing stroke were not considered for statistical analysis. Moreover, only the relationship between bilateral watershed strokes and hypoperfusion was analyzed, whereas monolateral watershed strokes were considered together with other stroke patterns in group 2, despite the underlying mechanisms being more similar in monolateral and bilateral stroke than in other stroke patterns. Hence, by its nature this interesting study evaluated the impact of hypoperfusion on stroke severity whereas no conclusion can be given on the role of changes in blood pressure on stroke incidence and stroke patterns.

The 2 groups analyzed (bilateral watershed infarcts and other infarct patterns) were not homogeneous at univariate analysis. As underscored by the authors, patients with bilateral watershed infarcts were more likely to have undergone an aortic procedure. Aortic procedures are at higher risk of neurological events because they involve wide aortic manipulation² which is considered a major risk factor for embolization.³ Patients with aortic dissections were found to have strong dominance of bilateral cerebral infarct, which was different from the unilateral pattern of "cardiac-type" operations.⁴ Moreover, surgery of the ascending aorta is generally performed with a different pattern of cardiopulmonary bypass as ascending aortic cannulation is avoided⁵ and involves more frequently deep hypothermic circulatory arrest.²

Even the duration of cardiopulmonary bypass was significantly different between the 2 groups. Cardiopulmonary bypass

machine produces systemic inflammatory response, destruction of blood cells, emboli, tissue edema and organ dysfunction.⁶ These effects lead to organ failure and poor outcomes if cardiopulmonary bypass time is increased.

In conclusion, the authors analyzed the effects of hypoperfusion on watershed strokes and gave new helpful information. However, the multifactorial bases of strokes still remain unclear and the relative role of hypoperfusion as well as embolization needs further study to be clarified.

Disclosures

None.

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