For brain hemorrhage, risk of death is lower at high-volume hospitals

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For patients with a severe type of stroke called subarachnoid hemorrhage (SAH), treatment at a hospital that treats a high volume of SAH cases is associated with a lower risk of death, reports a study in the November issue of *Neurosurgery*, official journal of the Congress of Neurological Surgeons.

After adjustment for other factors, the mortality rate after SAH is about one-fifth lower at high-volume hospitals, according to the report by Dr. Shyam Prabhakaran of Northwestern University, Chicago and colleagues. They write, "Our data suggest that experienced centers may provide more optimized care for SAH patients."

Hospital Volume Linked to SAH Mortality

Using data from a nationwide quality improvement program (the Get With the Guidelines-Stroke registry), the researchers identified nearly 32,000 patients with SAH treated at 685 US hospitals between 2003 and 2012. Subarachnoid hemorrhage is a type of stroke in which there is bleeding into the brain, most commonly caused by a ruptured aneurysm.

The study compared mortality rates and other outcomes for patients treated at hospitals with different volumes of SAH patients. The number of SAH cases treated per year ranged from as low as four at the lowest-volume hospitals to 13 or more at the highest-volume hospitals.

The risk of in-hospital death decreased as hospital volume of SAH cases increased: from 29.5 percent at the lowest-volume hospitals to 22.1 percent at the highest-volume hospitals. The difference remained significant after adjustment for differences in patient and hospital characteristics. In that analysis, mortality risk was about one-fifth lower at hospitals with the highest volume of SAH patients, compared to the lowest volume.

Other important SAH outcomes—including the percentage of patients sent directly home from the hospital and the percentage able to walk independently at discharge—were similar between high- and low-volume hospitals. In further analyses, an upper limit of hospital case volume was not identified above which the mortality benefit was not seen; instead, for every 5 cases, there was a 3% relative reduction in mortality.

Findings Add Support for Centralized Stroke Care

Patients treated at high-volume hospitals spent more time in the hospital: median 12 days, compared to five days at low-volume hospitals. This might be an indicator of "more aggressive care including monitoring for complications," Dr. Prabhakaran and coauthors write. However, they note their database did not include information on the specific services and treatments provided.

The results add to previous studies suggesting that hospitals treating a higher volume of patients with SAH may achieve better outcomes. The Get With the Guidelines-Stroke registry provides the opportunity to assess the effects of hospital volume in a large contemporary sample of patients, treated since the introduction of more recent advances in SAH care.

The results show a lower risk of death for SAH patients treated at higher-volume hospitals, independent of patient and other hospital

characteristics. Within the limitations of the data, the study adds support to the concept of treating stroke at Comprehensive Stroke Centers—which combine key resources and expertise needed to improve care for complex stroke conditions such as SAH. Dr. Prabhakaran and colleagues conclude, "Our results may have significant implications for regional stroke policies and procedures and affirm the recent recommendations that patients with SAH be treated at high-volume centers."

More information: "Hospital Case Volume Is Associated With Mortality in Patients Hospitalized With Subarachnoid Hemorrhage." journals.lww.com/neurosurgery/ … ith_Mortality.2.aspx

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