

Anesthesia and Alzheimer's

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In studies of human brain cells, the widely-used anesthetic desflurane does not contribute to increased production of amyloid-beta protein; however, when combined with low oxygen conditions, it can produce more of this Alzheimer's associated protein.

Over 200 million people undergo surgery each year, and there has been concern that anesthetic use may contribute to Alzheimer's and other brain disorders. Bin Zhang, Yuanlin Dong, Rudolph Tanzi, Zhongcong Xie, and colleagues examined this possibility with commonly used inhalation anesthetics isoflurane previously and desflurane more recently.

They subjected human brain cells to 12% desflurane for six hours (mimicking a surgery condition) and observed no changes in either the production of amyloid-beta protein or the rate of cell death. However, when combined with low oxygen levels (18%), desflurane could stimulate these cellular changes associated with Alzheimer's (hypoxia by itself did not induce any changes). The results with desflurane are contrary to the researchers' previous work, which found isoflurane by itself could stimulate both amyloid production and cell death.

The researchers do emphasize that the current findings are from cell culture experiments, and the next critical step will be to confirm these findings in animal models and test the effects of other anesthetic agents. But, these early results suggest that it is important to ensure anesthetic patients maintain sufficient oxygen in their brain.

Source: American Society for Biochemistry and Molecular Biology

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