Bypass Won't Reduce Neurocognitive Function In Children

School-aged children who undergo cardiopulmonary bypass (CPB) during surgery for less complicated congenital heart defects do not appear to suffer any impairments in neurocognitive abilities, such as intelligence, memory, motor skills and behavior. Researchers from The Children's Hospital of Philadelphia, in a study in the August issue of *Pediatrics*, reported on neuropsychological effects after surgery for acyanotic heart defects. Acyanotic heart defects, which include abnormal heart valves or a hole between the heart's chambers, are milder and less complex than heart defects which require surgery during infancy.

“Most previous studies of the neurocognitive effects of CPB for pediatric heart surgery have focused on surgery during infancy for complex congenital heart disease,” said Michael Quartermain, M.D., pediatric cardiologist and primary investigator of the study.

“Those children often have multiple risk factors for cognitive decline, such as genetic syndromes, abnormal brain development and the need for multiple operations. We decided to minimize those confounding factors by focusing on a group of asymptomatic older children with isolated heart disease, and the results are encouraging.”

In a prospective study of children aged 5 to 18 years undergoing repair of less complex congenital heart disease, the researchers compared 35 children undergoing open-heart surgery with 19 non-cardiac surgical patients and 12 non-surgical control patients. The researchers administered an in-depth neurospsychological battery of tests, including assessment of intelligence, memory, motor skills, attention, and behavior to all children in the study both before and six months after surgery. The researchers reported no significant differences between the bypass and non-bypass groups, with improvements in post-operative cognitive testing seen across the board.

“Cardiopulmonary bypass has long been implicated as a causative factor in abnormal neurocognitive outcomes after cardiac surgery, said Dr. Quartermain. “However, in this study, which controlled for the non-bypass effects of open-heart surgery, there was no significant decrease in neuropsychological status in these children and adolescents six months after surgery.”

He added that larger, multi-center and longer-term studies should further investigate this question, but that based on the current results, physicians who refer children and adolescents for surgical repair of acyanotic heart defects can be comfortable reassuring families of these findings regarding potential neuropsychological side effects of open-heart surgery.

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