

No drop in IQ seen after bypass for child heart surgery

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The use of cardiopulmonary bypass does not cause short-term neurological problems in children and teenagers after surgery for less complex heart defects, according to pediatric researchers. The new finding contrasts favorably with previous studies that showed adverse neurological effects after newborn surgery for more complex heart conditions.

"This is good news for school-aged children who receive surgery for these less complex heart defects," said study leader Michael D. Quartermain, M.D., a pediatric cardiologist at The Children's Hospital of Philadelphia. Quartermain presented the study group's results at the American Heart Association's Scientific Sessions today in New Orleans.

The research, conducted at the Cardiac Center of Children's Hospital, studied 41 patients, aged five to 18, who underwent heart surgery at the hospital while a heart-lung machine circulated their blood (under cardiopulmonary bypass, or CPB). All the patients had milder forms of congenital heart disease usually characterized by an abnormal heart valve or by a hole between the heart's chambers.

Such defects, while present from birth, are often not detected until a patient is school age or even older. Patients do not show obvious symptoms and are otherwise healthy, but surgical intervention is often recommended to prevent complications later in life. In contrast, more complex congenital heart defects, such as hypoplastic left heart syndrome, a severely underdeveloped ventricle, are life-threatening in infancy, and require urgent surgical repair.

Previous studies of survivors of more complex heart surgery have found neurological problems, such as impaired motor development, lower I.Q. scores and reduced language skills. As medical regimens and surgical techniques have advanced,

more recent studies have found milder neurological problems or normal neurological outcomes, but long-term outcomes remain a concern. Likewise, adults with acquired heart disease have sometimes suffered adverse neurological outcomes after surgery with CPB.

In the current study, researchers compared 41 pediatric heart patients who underwent CPB to a control group receiving non-heart-related surgery without CPB. Neurological and developmental testing were performed two weeks before and six months after surgery in both groups. When controlling for the effects of hospitalization and anxiety, the researchers found no significant difference between the two groups in I.Q. scores and tests of memory, motor skills or attention. Neither of the surgical groups showed a decline in neuropsychological scores after surgery.

Regarding the implications of the study, Quartermain said, "It is often challenging for the cardiologist to determine the optimal time to refer a child without symptoms to the operating room for repair of an underlying congenital heart defect. It is now clear that the potential neurodevelopmental sequelae of cardiopulmonary bypass in this group of school-aged patients should not be a major factor in this important decision."

Source: Children's Hospital of Philadelphia

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