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IN THE LAB

Can child's umbilical-cord blood be used to treat his own cerebral palsy?

A Duke University clinical trial with children shows 'great promise,' but no one knows just how well the treatment has worked.

By Erin Cline Davis
Special to The Times

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DALLAS HEXTELL looked like any other healthy toddler when he appeared on the "Today" show on March 11 -- walking, clapping, laughing, waving to his mom.

But just nine months earlier, cerebral palsy had kept Dallas, now 2, from crawling, sitting up or reaching other milestones of child development.

Dallas' parents attribute his remarkable improvement to an experimental treatment using an infusion of his own umbilical-cord blood, saved at the wish of his parents in a private bank at his birth.

But cerebral palsy and stem cell experts warn that no one knows yet just how well the treatment has worked or whether it will work for others with his condition.

"We would love for research like this to put us out of business," said Dr. Dara Richardson-Heron, national medical director for United Cerebral Palsy. But until more research is done, she said, "it's important to be cautiously optimistic."

About one of 278 children in the United States has cerebral palsy, a motor disability caused by brain damage.

The biggest risk factors for the condition are prematurity, an infection of the amniotic fluid and oxygen deprivation during gestation or birth.

Cord blood has been used with great success as an alternative to bone marrow transplantation to treat cancer and blood disorders such as sickle cell anemia. It can also be used to treat a class of rare but fatal inherited metabolic disorders called lysosomal storage diseases.

But evidence that the stem cells that reside in this blood can travel throughout the body and incorporate into organs fuel the hope that their use can someday be expanded to the regeneration of many damaged tissues.

This hope has led to an increasing interest by parents to save their child's cord blood in private, for-profit banks, as Dallas' parents did.

Dallas was treated as part of a clinical trial at Duke University and is one of 12 children with cerebral palsy who has undergone the procedure so far. The trial is based on animal studies in which cord-blood cells injected into rabbits with a cerebral palsy-like condition traveled to the brain and lessened symptoms, in some cases preventing them altogether. The trial will ultimately study 40 children, tracking each child's progress for two years.

In the treatment, the cord blood taken from Dallas' umbilical cord shortly after his birth was injected into his blood. The therapy is in this sense different from cord-blood-based therapies for cancers and genetic conditions, which rely on cord blood obtained from someone other than the patient -- either a child whose cord blood was donated to a public bank or a sibling.

Foreign blood is required for those conditions to avoid infusing patients with cells that may have the same defect that is causing disease. But to prevent the patient's immune system from rejecting the cells in the foreign blood, the procedure also requires chemotherapy to destroy the patient's immune system.

The risks of chemotherapy are too high to justify using someone else's cord blood until it is known whether the treatment will truly benefit children with cerebral palsy, says Dr. Joanne Kurtzberg, director of the Pediatric Blood and Marrow Transplant Program at Duke University Medical Center. For this reason, the trial is only treating patients who had their cord blood banked at the time of their birth.

To track progress, each child is evaluated by testing both their motor and cognitive skills over time. The results are then compared with the abilities doctors would have expected them to have based on their condition before the treatment.

Based on such evaluations, the treatment definitely appears to have benefited Dallas, Kurtzberg says.

But, she adds, "it's impossible to tell at this point" just how much progress he and others in the trial will make.

Kurtzberg says that of the children she has treated so far, only Dallas and one other child have made such dramatic improvements.

The others have had more modest results.

It is hard to tell, she adds, whether improvements were from the treatment, a "placebo effect" based on extra attention to the children and raised expectations of parents and physicians, or some other approach the parents were also trying.

Richardson-Heron stresses that it is important that families of children with cerebral palsy not get false hope from stories like Dallas'. The results of the cord-blood study so far "have great promise and are very exciting," she said, but until further research is done, "I would not call this a cure."

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