MedicalXpress

Very low birthweight Down syndrome infants at high risk for heart, lung disorders

November 22 2010

Very low birthweight Down syndrome infants are at higher risk for disorders of the heart and lungs than are very low birthweight infants who do not have a chromosomal variation, according to a study by a National Institutes of Health research network.

The study was conducted by researchers in the Neonatal Research Network of the NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) and was published online in Pediatrics. The researchers sought to identify health concerns unique to this group of infants, to inform their care and treatment.

Very low birthweight (VLBW) infants are those weighing less than 3.5 pounds. The principal causes of very low birthweight are preterm birth and failure to grow in the uterus. Low birthweight infants are at increased risk for death during infancy and for such health complications as cerebral palsy, learning disabilities, heart disorders and breathing problems.

The researchers found that VLBW Down syndrome infants had more than twice the risk of death during infancy as VLBW infants born without a birth defect or chromosomal variation. The increased risk of death was due in part to the more frequent occurrence of conditions affecting the heart, lungs and digestive tract among the Down syndrome infants, and the greater likelihood of a life-threatening blood infection. VLBW Down syndrome infants were less likely to develop retinopathy of prematurity, an overgrowth of blood vessels in the retina, which can

affect vision.

"Previously, health professionals caring for very low birth weight Down syndrome infants had to base treatment decisions on studies of the general population of very low birth weight infants and on studies of infants with Down syndrome who may not have been of low birthweight," said senior author Rosemary D. Higgins, M.D., of the NICHD. "Our study provides much needed information for practitioners and families making treatment decisions for this unique group of patients."

With Down syndrome, an extra copy of chromosome 21 results in a distinctive set of mental and physical symptoms.

Over a period of 15 years, the researchers analyzed the medical records of more than 50,000 infants born weighing between .875 and 3.5 pounds. The researchers compared rates of survival and the prevalence of eye, digestive, and lung complications among infants with Down syndrome, infants with certain chromosomal variations other than Down syndrome, infants with non-chromosomal birth defects and those without birth defects or chromosomal variations. The researchers collected information from the 22 medical centers that make up the NICHD's Neonatal Research Network.

The study's lead author was Nansi S. Boghossian, M.P.H., of the University of Iowa, Iowa City.

"Our analysis encompasses the largest group of very low birth weight Down syndrome infants ever studied, " Boghossian said.

The researchers found that VLBW Down syndrome infants were about 2.5 times more likely to die in infancy than were VLBW infants who did not have a chromosomal variation or a birth defect. This increased risk

was attributed in part to a greater likelihood of patent ductus arteriosis (a malformation of the heart), bronchopulmonary dysplasia (a lung disorder that may impair breathing), necrotizing enterocolitis (a serious inflammation of the bowel) and sepsis (an infection of the blood). Infants with Down syndrome had roughly the same chance for survival as did infants with non-chromosomal birth defects.

The researchers also found that the Down syndrome infants in the study were much less likely than all other infants to develop retinopathy of prematurity. Previous studies have indicated that genes found on chromosome 21 may slow blood vessel growth. These genes are believed to influence the growth of blood vessels in tumors, and individuals with Down syndrome are less likely to develop tumors than are other individuals. These same genes may protect Downs infants from blood vessels overgrowth in retinopathy of prematurity. The authors added that future research on Down syndrome infants' reduced risk for retinopathy of prematurity might provide new insights into this disorder affecting the retina.

Provided by National Institutes of Health