US not taking basic step to prevent toxoplasmosis in newborns, researcher contends

October 5 2011

North American babies who acquire toxoplasmosis infections in the womb show much higher rates of brain and eye damage than European infants with the same infection, according to new research from the Stanford University School of Medicine.

Eighty-four percent of the North American infants studied had serious complications of the parasitic infection, including calcium deposits in the brain, water on the brain and eye disease that caused visual impairment or blindness. By contrast, few European infants had these problems -- for instance, about 17 percent of French infants with the infection develop complications.

"It was a shock," said Jose Montoya, MD, the study's senior author and an associate professor of infectious diseases at Stanford. "We were dismayed to see so many little ones with severe eye disease, hydrocephalus and brain calcifications."

The study, which will be published online Oct. 5 in the *Pediatric Infectious Disease Journal*, examined 155 U.S. and nine Canadian infants whose congenital toxoplasmosis infections were confirmed by screening tests at the Palo Alto Medical Foundation Toxoplasmosis Serology Laboratory, the nation's toxoplasmosis reference laboratory, between 1991 and 2005. Montoya is the director of the lab. The study is the most comprehensive to date on congenital toxoplasmosis in the United States,

where it is estimated to affect 500 to 5,000 pregnancies per year. (Other studies with more Canadian subjects have explored toxoplasmosis infections there in more detail.)

The infection, which is caused by the parasite *Toxoplasma gondii*, can be acquired several ways, such as by eating raw or undercooked meat or shellfish, contact with cat feces, or being exposed to soil while gardening. Infants whose mothers first acquire the parasite during pregnancy are vulnerable to the congenital infection. Medication can potentially prevent mother-to-child transmission, but none of the mothers in the new study received treatment for toxoplasmosis during pregnancy.

Clinical information was available for 138 infants in the study. Of those who showed toxoplasmosis complications, 92 percent had eye disease, nearly 80 percent had brain calcifications and 68 percent had hydrocephalus. About 61 percent of the infants with complications had all three complications together. The complications were severe enough to cause permanent visual or mental impairments for many of the infants, Montoya said, though the study did not track the children beyond infancy.

In contrast, the rate of complications among Western European infants with congenital toxoplasmosis is much lower. Recent findings from another research team showed that 15 percent of European infants had eye disease and 6 percent had cranial calcifications, for example. The European literature has rarely reported cases of hydrocephalus in recent decades.

The difference between continents has several possible explanations, Montoya said. One possibility is referral bias -- the U.S. lab that provided data for the new study tends to see only the country's most severe cases, whereas European labs have comprehensive data on all

pregnancies affected by toxoplasmosis. Another possibility is that the two continents harbor different strains of toxoplasma parasite, though John Boothroyd, a Stanford professor of microbiology and immunology who studies toxoplasma but was not involved in this research, said the same strains appear to explain most human infections on both continents.

A third explanation, and the possibility that worries Montoya, is that the difference is due to shortfalls in U.S. prenatal care. Pregnant women in Europe are screened regularly for new toxoplasma infections and treated to prevent transmission of the parasite to the fetus. But prenatal screening and treatment is rarely offered in the United States. Screening is needed because toxoplasmosis can occur even in pregnant women who carefully avoid known transmission methods. What's more, the infection can occur without any symptoms in the mother.

"There is a tragedy out there that can be prevented through thoughtful, low-cost serological screening of one of our most vulnerable populations -- the mother-baby pair," Montoya said. "The sad part is that in the U.S., although we have the tools at both the medical and the lab level to detect and treat prenatal toxoplasma infections, we don't apply them."

Testing pregnant women for toxoplasmosis infection would not be complicated, Montoya said. The existing tests require a blood sample and can be conducted at any commercial laboratory. Although research is still needed to verify the cost-effectiveness of such testing, the tests could be made quite inexpensive -- in the range of $5 to $10 each, he said. The testing could be performed on blood that is already drawn for other tests during pregnancy.

"We are strong believers that pregnant women have the right to know whether the baby is at risk, or whether the baby has been infected, in the same way that parents have a right to know if their baby has a metabolic

defect or a hearing problem," Montoya said.

Provided by Stanford University Medical Center