Chemotherapy during pregnancy does not seem to cause developmental problems in children

September 26 2011

Children born after their mothers were treated with chemotherapy during pregnancy appear to be unaffected by the experience in terms of the development of their mental processes and the normal functioning of their hearts, according to new research presented at the 2011 European Multidisciplinary Cancer Congress.

Professor Frederic Amant will tell the congress: "To the best of our knowledge this is the first time that children of 18 months and older have been examined after chemotherapy during pregnancy, and the news is reassuring in respect of the effects of chemotherapy on cognitive and cardiac outcomes."

However, he will say that a significant number (47) of the 70 children born from 68 pregnancies were delivered preterm and the researchers found that prematurity, but not chemotherapy, did affect these children's cognitive development significantly.

Prof Amant, a gynaecological oncologist at the University Hospitals Leuven (Leuven, Belgium), and colleagues in two other European countries (The Netherlands and the Czech Republic) started to recruit children to the study in 2005. They included children who had been born before that time (between 1991-2004) as well as those born between 2005-2010, so that they ranged in age from 18 months to 18 years. The children were examined at birth and at the ages of 18 months, 5-6, 8-9,

11-12, 15-16 and 18 years. The children's health was monitored for an average of nearly two years, with some of them being followed for as long as 18 years.

While the 68 mothers were pregnant, they were being treated with chemotherapy, either on its own or in combination with radiotherapy or surgery or both, for a range of different cancers. The most common cancer was breast (35 women), followed by haematological cancers such as leukaemias and lymphomas (18), ovarian cancer (6), cervical cancer (4); other cancers included brain, skin, colorectal, nasopharyngeal, and Ewing's Sarcoma.

The researchers collected data on the mothers' treatment and medical history, and then assessed the children's general health, school performance, any sporting activity and the family's social situation by means of questionnaire completed by the parents at each assessment visit. They looked at the development of the children's mental processes by evaluating intelligence, verbal and non-verbal memory, attention, working memory and executive functions (the ability to control and regulate other abilities and behaviours). Parents also completed a questionnaire on behavioural and emotional problems. Cardiac function was assessed by electrocardiography (ECG) and echocardiography.

The average gestational age at which the children were born was 35.7 weeks; seven children were born very early (28-32 weeks), nine were born early (32-34 weeks), 31 were born preterm (34-37 weeks) and 23 were born at term (37 weeks or more). There were two twin pregnancies.

Prof Amant and his colleagues found that the incidence and type of congenital malformations were similar to the general population, as was growth, general health and development; no heart abnormalities were detected. Cognitive development was in the normal range for the majority of the children, but those that fell below the normal IQ range

were mainly those that had been born early. One set of twins, who were born at 32.5 weeks, had significant neurodevelopmental delay, and for these twins the researchers said they could not rule out prenatal exposure to chemotherapy as being the possible causal factor.

Prof Amant says: "Our results so far suggest that children who were prenatally exposed to chemotherapy seem to do as well as children in the general population, and, that the treatment does not influence the development of mental processes or the functioning of the heart in the children we have followed for an average of 22 months. Therefore, although the role played by chemotherapy in the poor outcome of one of the twin pregnancies cannot be excluded, we believe these results do allow us to make a recommendation about chemotherapy in pregnancy: pregnant women with cancer do not need to delay their cancer treatment or terminate their pregnancy. The benefits of chemotherapy to the mothers outweigh any potential long-term harm to the children.

"However, it is important to prevent preterm birth if possible and continue pregnancy until at least 37 weeks, as the data suggest the children suffer more from prematurity than from prenatal chemotherapy. Pregnant women who are receiving chemotherapy often have delivery induced from the moment the foetus is viable although not mature. Our results suggest this should be avoided."

He says that that it is not clear whether chemotherapy itself could be a possible cause for premature delivery, but that in many cases preterm delivery is induced and is itself the cause of the cognitive developmental problems seen in this group of children.

Prof Amant will conclude: "At this stage we do not know the full, long-term consequences of prenatal chemotherapy, including its effect on the children's fertility and likelihood of developing cancers when they are older. For this reason, we are continuing this international collaboration

to follow-up more children for longer periods of time."

Provided by ECCO-the European CanCer Organisation