

## Maternal Obesity: Increased Cancer Risk for the Children

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*Translated from Le Journal de Montréal, September 23rd, 2019*

*Babies born to women who are severely obese are at greater risk of developing cancer during the first years of their lives.*

Childhood cancers are, fortunately, rare phenomena as children represent less than 1% of all cancer patients.

Unlike adult cancers, which take decades to develop and which are strongly affected by lifestyle, pediatric cancers are caused by defective genes transmitted by heredity, either at conception or else by mutations which arise during pregnancy or very early in childhood.

Several observations suggest however that in most cases, these genetic anomalies are not sufficient to generate a cancer.

For example, studies performed on identical twins (who share the exact same genes) have shown that simultaneous development of leukemias in the two twins is a relatively rare phenomenon; in other words, despite the presence of the same genetic anomalies in the two babies, only 5% of pairs of twins simultaneously develop the disease. As well, analysis of the blood of newborns shows that only 1% of babies who have acquired a genetic anomaly during gestation that is prone to causing leukemia will eventually develop the disease.

It thus seems that other factors, probably linked to the biochemical and physiological environment in which the cancer cells are found, participate in the development of the disease.

### MATERNAL OBESITY

According to a recent study, maternal obesity could be one of these factors<sup>1</sup>. By analyzing the medical records of nearly 2 million babies born between 2003 and 2016, researchers noted that 2352 of them were diagnosed with cancer before the age of 14, the most common of which were acute leukemias, particularly acute lymphoblastic leukemia and neuroblastoma (a cerebral tumor).

A more detailed analysis showed that the risk was significantly influenced by the body mass index (BMI) of the mother before pregnancy: babies born to highly obese mothers (BMI>40) had 32% greater risk of developing a cancer in general and a 57% greater risk of leukemias in the 5 first years of life compared to those born of mothers with a normal BMI (18-25).



It has been known for many years that obesity represents an important risk factor for several cancers in adults, but this was the first time that excess weight had been associated with an increased risk of pediatric cancer, particularly acute leukemias.

According to the authors, it is likely that hormonal imbalances (particularly in levels of insulin and insulin-like growth factor) and the increased inflammation caused by maternal obesity reach the fetal circulation where they can promote the uncontrolled growth of certain cells and the appearance of a cancer during the first years of a baby's life.

### GESTATIONAL WEIGHT GAIN

What about the weight put on during the pregnancy?

According to the results of the study, the gestational weight gain does not have a major impact on the risk of leukemia, but can promote the development of another type of common pediatric cancer, the neuroblastoma: analysis of the data showed that babies born of mothers who gained more than 30 kg during their pregnancy were twice as likely to develop this cancer.

To reduce this risk, they recommend avoiding excessive weight gain during pregnancy: for women of normal weight (BMI around 25), a gain of 10 to 15 kilos is generally recommended. In contrast, women who have excess weight at the outset (BMI between 25 and 30) should limit this gain to 7-10 kg or even less if they are obese.

The increased risk of acute leukemias in babies born to very obese mothers also suggests that women who wish to have a baby would be better off losing weight before becoming pregnant to avoid exposing the developing fetus to significant metabolic perturbations caused by obesity.

<sup>(1)</sup> Stacy SL et al. Maternal obesity, birth size, and risk of childhood cancer development. *Am. J. Epidemiol.* 2019; 188: 1503–1511.