**Potential Effect of Granisetron on Fetal Tissue during Pregnancy**

 Nausea and vomiting affects more than 80% of women during the time of their pregnancy. Severe form of morning sickness, called hyperemesis gravidarum, can cause malnutrition and jeopardize the health of the mother and the fetus. Many women seek medical assistance and pharmacological intervention to help subside their symptoms, but the drugs prescribed could be causing more harm than good to the unborn fetus. The study in focus addresses this issue and determines if the drug could cause potential unforeseen complications.

The most commonly prescribed treatment is the pharmaceutical drug, Granisetron, a 5-hydroxytryptophan receptor type 3 antagonist (5-HT3). It has been found that Granisetron can cross the placenta and is present in fetal tissue at a ratio of 0.41 to maternal plasma concentrations. What has caused concern is the unknown effect of these concentrations on the developing fetal tissue. Suspicion has risen over the increased likelihood of certain birth defects such as cleft palate and other organ defects.

Researchers evaluated the effect of Granisetron on fetal brain, lung, heart, kidney, and small intestine tissue following the treatment of intravenous and transdermal administration of the pharmaceutical drug. Analyses for immunoblotting for changes in expression of markers of apoptosis and flow cytometry of the fetal organ tissues were performed. Scientists noticed that there was an increased accumulation of the drug in fetal cardiac tissue compared to the untreated controls. The cardiac tissue showed increased level of apoptosis, programmed cell death, at the G0 part of the cell cycle.

The potential cardiac toxicity associated with fetal exposure to granisetron is an interesting topic considering the FDA’s recent Safety Alert regarding granisetron use and the reports of abnormal heart rhythms in pregnant women and their fetuses. In the cardiovascular system there are expression of these 5-HT3 serotonin receptors that facilitate the Bezold-Zarish reflex, which controls cardiac response to hypotension and bradycardia, therefore if these receptors are blocked or inhibited it may lead to tachycardia heart arrhythmias. The new data about this drug gives health care professionals a chance to consider what dose of 5-HT3 antagonists are safe to use during a woman’s pregnancy. In the past, when evaluating drug safety in pregnancy the outcomes measured have focused on data such as low birth weight, pre-term labor, or birth defects, but until now cardiac changes have not been detectable.

The current study suggests that there is an association between granisetron concentrations and cardiac fetal tissue toxicity during pregnancy. The next step is to perform additional studies to evaluate the level of risk associated with the IV and transdermal administering of granisetron to treat severe nausea and vomiting in pregnant women and the consequential effect on the unborn fetus. This needs to be further studied in both in vitro and in vivo as sometimes the results from the studies may differ. The research currently indicated that administration of granisetron via a transdermal patch may reduce the peak plasma concentration and thus have a decreased toxic effect on the fetus.

References:

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