

Poster #4

Fetal Exposure to Phytoestrogens in Monkeys

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Introduction: Phytoestrogen isoflavones are estrogen-like chemicals that are diverse in their chemical structures as well as their plant origins. Some phytoestrogens compete with estradiol for binding to estrogen receptors and elicit estrogenic responses in estrogen-target tissues and cells.

Soy consumption is suggested to contribute to prevention of chronic diseases, including cardiovascular disorders, osteoporosis, and cancer. Another aspect of phytoestrogen was described that phytoestrogen caused infertility and fetus death of sheep and rats.

One concern is that exposure to phytoestrogens may pose a developmental hazard to infants and fetus. But it was not known the presence of fetal exposure to phytoestrogen. Therefore, to examine whether phytoestrogens in maternal blood transfer to fetal blood passing blood-placental barrier, we investigated the concentrations of phytoestrogens in maternal blood and umbilical cord blood.

Method: Blood samples were obtained from female monkey and umbilical cord of her infant. Whole blood isoflavone concentrations were determined by liquid-chromatography / tandem-mass spectrometry (LC/MS/MS). We examined rhesus monkey, chimpanzee and Japanese monkey.

Result and discussion: We detected isoflavones such as genistein, daidzein and equal in maternal blood and cord blood. Coumesterol was not detected in maternal blood or cord blood. Concentration of each isoflavone was higher in cord blood than maternal blood. Our study showed that phytoestrogen isoflavones were transferred to fetus from maternal blood. The reason that the concentrations of these isoflavones were higher in cord serum than maternal serum is unclear. These isoflavones may be concentrated through blood-placental barrier.

In conclusion, we confirmed fetal exposure to phytoestrogens via placenta in monkeys.