

Neonatal Isoflavone Exposure Interfers with Reproductive System of Female Wistar Rats

Program: Abstracts - Orals, Poster Previews, and Posters

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Basic

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Soy based infant formulas (SBIF) are used in many western countries as one alternative to breast feeding. Recently there is increasing concern about possible adverse effects of such diets. Soy contains high amounts of isoflavones (ISO), which are hormonal active substances. To give SBIF to infants leads to extremely high serum concentrations of ISO in a sensitive phase of child development. Particularly there are concerns that ISO may affect the development and physiological function of reproductive tract later in life.

The aim of our study was to investigate effects of ISO on the development of the reproductive tissues in different exposure scenarios with major focus on neonatal exposure in a Wistar rat model.

In our study we address and simulate four different exposure scenarios. Exposure to two different diets started with parental animals one week prior mating, continued during *in utero* period, maintained through adolescence into adulthood. Animals were exposed to: A, a ISO depleted diet (IDD) and B, same diet enriched with an ISO extract (IRD; 508mg ISO/kg). Pups of each group were randomized into subgroups and fed daily by pipette with ISO-suspension [(32 mg ISO/kg BW) ISO+] and placebo from postnatal day (PND) 1 until PND 23 resulting in concentrations similar to levels reported in infants fed SBIF. Rats were sacrificed at PND 23 and 80.

Body weight and food intake were not affected by ISO+, lifelong IRD diet increased both by tendency. Interestingly, visceral fat mass was significantly reduced in IRD groups.

Vaginal opening (VO), a marker for puberty onset, occurred significantly earlier in animals through ISO+ independently whether the animals were kept on IDD (9.4 days earlier) or IRD (5.5 days earlier). A significant increase of vaginal epithelial height was observed in ISO+ on PND23.

We observed more often irregular estrus cycles in ISO+ rats. This influence on female's reproductive tract later in life was also supported by an increased uterine and vaginal epithelial height, as well as increased circulating FSH levels at PND80.

In summary, our results indicate that ISO intake during weaning period has an estrogenic effect on prepubertal rats indicated by increased vaginal epithelial heights and earlier VO. In addition the exposure of rats during the period of weaning to ISO resulted in estrus cycle irregularities. That indicates that SBIF may result in adverse effects on reproductive tract even later in life.