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EFFECTS OF TRANSPLACENTAL AND TRANSLACTATIONAL EXPOSURE TO TEMBOTRIONE ON SEX HORMONE LEVELS IN RAT OFFSPRING UNTIL PUBERTY

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Tembotrione, a triketone herbicide used for post-emergence weed control in corn, as a potential endocrine disrupting chemical can disrupt reproductive and sexual development by affecting sex hormones. This could be especially detrimental during early development with adverse effects until adulthood. We evaluated the effects of tembotrione exposure during gestation and/or lactation on estradiol and testosterone levels in female and male offspring 24 hours after birth (newborns), at weaning (21-day-old pups) and at the beginning of puberty. Wistar rats were exposed orally to tembotrione doses relevant to real human exposure: 0.0004, 0.0007 and 4.0 mg/kg bw/day and ethinylestradiol as positive control (PC) during the entire gestation and/or lactation period. Hormone levels were measured in offspring serum by enzyme-linked immunosorbent assay. Oestradiol decreased at 4.0 mg/kg bw/day compared to negative control (NC) and PC, 0.0004 and 0.0007 mg/kg bw/day in newborns and increased at 4.0 mg/kg bw/day compared to 0.0004, 0.0007 mg/kg bw/day and PC in 21-day-old pups exposed only during lactation. Exposure during gestation and lactation increased oestradiol at 0.0007 mg/kg bw/day compared to PC and 0.0004 mg/kg bw/day in 21-day-old pups. In pubertal female offspring, oestradiol decreased at 0.0004 mg/kg bw/day compared to PC. Testosterone increased in newborns at 0.0004 mg/kg bw/day compared to NC, PC and 0.0007 mg/kg bw/day and in 21-day-old pups exposed only during lactation compared to PC and 0.0007 mg/kg bw/day. In 21-day-old pups exposed during gestation and lactation, testosterone decreased at 0.0007 mg/kg bw/day compared to PC and 4.0 mg/kg bw/day. Testosterone in pubertal male offspring decreased at 0.0004 mg/kg bw/day compared to NC and 0.0007 mg/kg bw/day. Our results suggest that exposure to tembotrione during gestation and lactation periods disturb sexual hormone levels both in female and male rat offspring.

Biography

Anja Mikolic has graduated at the Faculty of Food Technology and Biotechnology, University of Zagreb in 2005. She acquired PhD in Biomedicine and Health Sciences at the Faculty of Pharmacy and Biochemistry, University of Zagreb in 2015. She is employed at Institute for Medical Research and Occupational Health, Zagreb, Croatia since 2007. She has published as Co-author of 10 original scientific papers in the international peer-reviewed journals, participated on national and international scientific conferences and training courses and she is a member of few scientific associations.

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