Maternal exposure to glyphosate-Roundup leads to oxidative stress in testicular cells from male offspring

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Pesticides are chemical compounds widely used in rural activities in order to raise agricultural productivity and some of them are considered partially safe for human health. Currently, the planting of transgenic soybeans resistant to Roundup has intensified the consumption of the pesticide glyphosate-Roundup. The objective of this study was to investigate the effects of Roundup in some parameters of the antioxidant defense system in prepubertal rat testes. The animals were exposed to 1% Roundup in the drinking water from gestation day 5 until the male pups reaching 30 day-old. On the day of the experiment, the testes were removed, weighed and homogenized in 20 mM phosphate buffer containing 0.1% Triton X-100 1:20 (P: V) to determine the activity of the enzymes glutathione reductase (GR), glutathione peroxidase (GPx), glutathione-S-transferase (GST), and catalase (CAT). To evaluate the activity of gamma-glutamyl transferase (GGT) or glucose-6-phosphate dehydrogenase (G6PD) the testes were homogenized in Tris-HCl pH 8.5 or pH 7.4, respectively. We also determined the levels of GSH and protein carbonyl (PC). The results showed depletion of GSH associated with increased PC, suggesting that exposure to pesticide induces oxidative stress. The activities of enzymes GST, CAT and GGT were induced, while the activity of G6PD, GPx and GR were inhibited by chronic exposure to Roundup. Altogether, results demonstrated that the endocrine disruptor Roundup altered antioxidant defense system in prepubertal rat testis and these events may be associated with reproductive disorders commonly observed in chronically exposed farmers.

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