Endocrine disruptive effect of plastic byproduct Bisphenol A on growth hormone activity

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Bisphenol A (BPA) is a byproduct of polycarbonate plastic widely present in food containers. BPA is an estrogen (E2) agonist. Recent studies have shown that estrogen antagonizes growth hormone (GH) actions. Since BPA has estrogen agonist activity, the effect of BPA exposure on growth hormone activity has not yet been investigated.

Methods:
- Male CD1 mice given BPA (1.75mM) in drinking water from weaning age for three months.
- Body weight, length, tibia length were measured weekly.
- Hepatic GHR, STAT5, SOCS2 were measured by western blotting.
- Plasma GH and IGF-1 measured by ELISA.

Conclusion:
In humans, there is a dramatic decrease in longitudinal bone growth, which begins during intrauterine life and is interrupted briefly at puberty.

Here we found for first time that exposure to BPA, a plastic byproduct, interrupt linear growth with downregulation of growth hormone signaling and mice exposed to BPA exhibit supranormal linear growth phenomenon known as catch-up growth.

Further investigation is needed to study the effect of BPA on the metabolic action of GH specially those related to body fat content and impact on increasing worldwide epidemic of obesity.

Further In-Vitro experiments are conducted to test specific effects of BPA on GH signaling and exclude systemic effects of BPA.

References:


Results:

Figure 1: Percentage changes of body weight in mice given bisphenol A (BPA) in drinking water for three months.

Figure 2: Percentage changes of tibia length in mice given bisphenol A (BPA) in drinking water for three months.

Figure 3: Hepatic expression of STAT5 and SOCS2 in mice given 3 months of BPA in drinking water compared to control group (Water).