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85 - Cocktail effects of endocrine disruptors: bisphenols and human ovarian granulosa cells

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Human population is exposed to endocrine disruptors (ED). The ban of BPA, an ED, in France and Canada in food industry, led to the emergence of structural analogs that are not yet regulated. The objectives of this project were to 1) study the effects of bisphenol in vivo exposure in women undergoing assisted reproductive technology (ART) on embryo parameters and gestation rate and 2) to characterize the in vitro effects of 7 bisphenols, individually and in equimolar cocktail, on human granulosa cell (hGC) steroidogenesis.

Bisphenols were detected in 18.8% of 368 women follicular fluid samples, mainly BPS and then BPA. Our linear regression analysis showed that women exposed to bisphenols exhibited a higher number of embryos (either transferred or frozen) and a higher gestation rate which was unexpected. Women with higher BMI increased follicle numbers but decreased birth rate. Older women showed a lower number of mature oocytes.

In vitro, BPAF and BPAP significantly decreased estradiol secretion at 10 µM. All 7 bisphenols (BPS, BPA, BPAF, BPAP, BPE, BPB, BPF) and the equimolar cocktail at 50 µM inhibited progesterone secretion, the same effect being observed at 10 µM except for BPF.

Finally, in vivo exposure to bisphenol seems to affect female reproductive parameters, but further studies with a higher number of women are required to confirm our data. In vitro, all seven bisphenols and their equimolar cocktail alter steroidogenesis in hGC, and exposure to this cocktail showed a cumulative effect, therefore supporting a global regulation of the bisphenol family.

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