Environmental estrogens and sperm function

Dear Sir,

In January 2003, our paper entitled ‘17β-Estradiol and environmental estrogens significantly affect mammalian sperm function’ was published in Human Reproduction (Adeoya-Osiguwa et al., 2003). On behalf of our colleagues, we would like to register our concern regarding misrepresentation of our results in the recently published paper by Aquila et al. (2003).

Aquila and colleagues evaluated the effects of estradiol (E2) and aromatizable steroids on various human sperm parameters including motility, protein tyrosine phosphorylation and acrosome reactions. In most of the protocols, they used unsupplemented Earle’s balanced salt solution; the authors do not define the composition of this medium but they term it ‘non-capacitating’. However, in one protocol they used a ‘capacitating’ medium, defined as Earle’s balanced salt solution supplemented with CaCl2, BSA, sodium pyruvate, sodium lactate and sodium bicarbonate; we therefore assume that none of these constituents was present in the ‘non-capacitating’ medium. The rationale for using such a medium to evaluate sperm parameters such as hyperactivated motility and acrosome reactions that are only expressed under capacitating conditions is perplexing. It has been known for decades that human sperm will neither hyperactivate nor undergo the acrosome reaction in the absence of Ca2+, HCO3− and a macromolecule such as BSA. The only physiologically sound approach would have been to use a capacitating medium for all investigations and look for steroid-induced acceleration of capacitation-dependent parameters. The failure to use such a medium for most of the experiments carried out on steroid-treated sperm suspensions means that the data cannot be interpreted.

Our particular concern is that the authors state that ‘further support for [their interpretation of their own results] is raised by the recent findings that estradiol stimulates capacitation in non-capacitating medium (Adeoya-Osiguwa et al., 2003)’. This is a clear misrepresentation of our study. We used a medium that supports capacitation and fertilization in vitro to show that E2 and three environmental estrogens significantly accelerated both capacitation and the acrosome reaction, with the environmental compounds being much more potent than E2. We would not expect to have obtained those responses if we had used a non-capacitating medium.
References


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