



The transgenerational impact of benzo(a)pyrene on murine male fertility.

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Abstract:

Abstract BACKGROUND: Benzo(a)pyrene (BaP) is an endocrine toxicant that is widely distributed in the environment. The adverse effects of BaP on fertility are well documented, however its effects on fertility in the subsequent generations are not known. We aimed to investigate the transgenerational effects of BaP on male fertility in mice. **METHODS:** Six-week-old male mice (F0) were orally administered BaP (1 or 10 mg/kg body weight) or corn oil, daily for 6 weeks. The male mice were mated with untreated female mice to produce F1 offspring. The F2 and F3 progeny were produced in a similar manner. Testes and spermatozoa were collected from 14-week-old F0, F1, F2 and F3 males in order to assess male fertility parameters, namely testis histology, sperm count, sperm motility and sperm penetration (sperm penetration assay). **RESULTS:** Oral administration of a high dose of BaP induced testicular malformation and decreased numbers of seminiferous tubules with elongated spermatids for three generations studied (i.e. F0 to F2) with significant decreases in F0 and F2. It also significantly decreased sperm motility in F0. BaP significantly decreased sperm count in the group treated with a high dose of BaP in all generations except the F3 generation. The sperm fertility index (SFI) also decreased significantly for two generations. Of the fertility parameters measured, sperm count and SFI were the more sensitive parameters in our study. **CONCLUSIONS:** Exposure to BaP decreases the fertilization potential of exposed males and has an adverse impact on sperm function and fertility in subsequent generations. The BaP effect on fertility can be described as a transgenerational effect for F2 generation.

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