Bisphenol A Concentrates Preferentially in Human Uterine Leiomyoma and Induces Proliferation in Rat Myometrium

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Abstract:

To measure tissue levels of bisphenol A (BPA) in uterine leiomyoma (ULM), adjacent myometrium (Myo-F), and normal myometrium (Myo-N). Also, we tested the effect of BPA treatment on rat myometrium. Methods: Uterine leiomyomas and Myo-F tissues were isolated from hysterectomy specimens done to treat symptomatic ULMs (N = 30). Normal myometrium is isolated from hysterectomies done on ULM-free uteri for other benign indications (N = 25). Bisphenol A was measured in 1 g of tissue using solid-phase extraction and high-performance liquid chromatography, with fluorescence detectors. Experimentally, adult female rats were fed BPA orally at a dose of 50 mg/kg/d for 90 days. Animals were killed, and their myometrial thickness and proliferating cell nuclear antigen (PCNA) immunostaining were evaluated. Results: Tissue concentration of BPA in each of ULM (12.3 ± 2.8 mg/g) and Myo-F (10.1 ± 0.2 mg/g) was significantly higher than that of Myo-N (0.58 ± 0.2 mg/g). There was no statistically significant difference in BPA level between ULM and Myo-F within submucous or interstitial/subserous fibroid groups. Compared to control rats, BPA-treated animals showed significantly higher myometrial thickness (168.67 ± 5.7 mm and 281.6 ± 20.32 mm, respectively, P = .003) and increased myometrial PCNA immunoscores (1.5 ± 0.37 and 10.38 ± 0.67, respectively, P < .001). Conclusion: Bisphenol A concentrates in human ULM tissue and its adjacent Myo-F compared to Myo-N. No significant difference is detected in BPA content of ULM tissue of different subtypes. Bisphenol A increases thickness and induces cellular proliferation in rat myometrium. Taken together, our results support a role of BPA in ULM development/growth.

Keywords:

uterine leiomyoma, bisphenol A, myometrium

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