

Polychlorinated Biphenyls(PCBs) Show Limited Effects on Voiding Physiology in Adult-Exposed Female Mice

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Background

- Lower Urinary Tract Symptoms (LUTS) likely have complex etiology.
- Whether environmental chemicals contribute is not well understood.
- Polychlorinated biphenyls (PCBs) are known to target the developing brain and bladder of developmentally exposed offspring.
- PCB effects on adult mice are unknown.

Our goal was to test the hypothesis that PCB exposure leads to changes in bladder function in female mice exposed in adulthood.

Methods

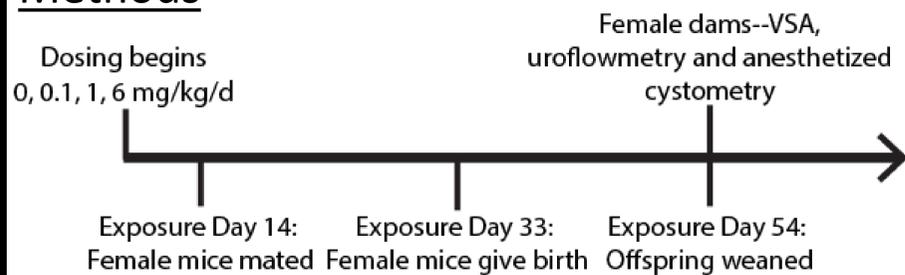


Figure 1: Dosing paradigm for C57Bl/6J wild type female mice with MARBLES PCB mixture.

Reproductive Toxicity—PCB exposure did not alter female reproduction or offspring body mass.

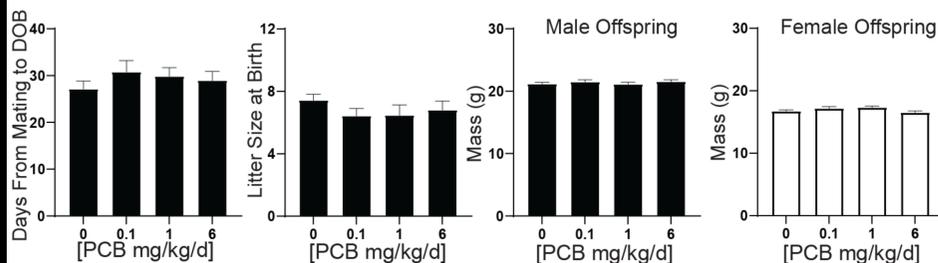


Figure 2: PCBs did not alter the number of days from first mating to date of birth, litter size at birth or mass of resulting offspring. Results are mean \pm SEM. n=13-15 dams; n=10-15 litters; n=29-41 males, n=27-49 females. No significant differences were found as determined by one-way ANOVA, $p \leq 0.05$.

Void Spot Assay—PCB exposure caused a significant increase in medium-sized spots.

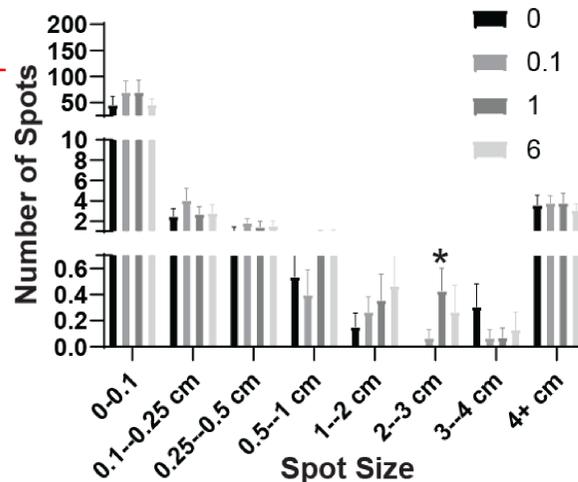
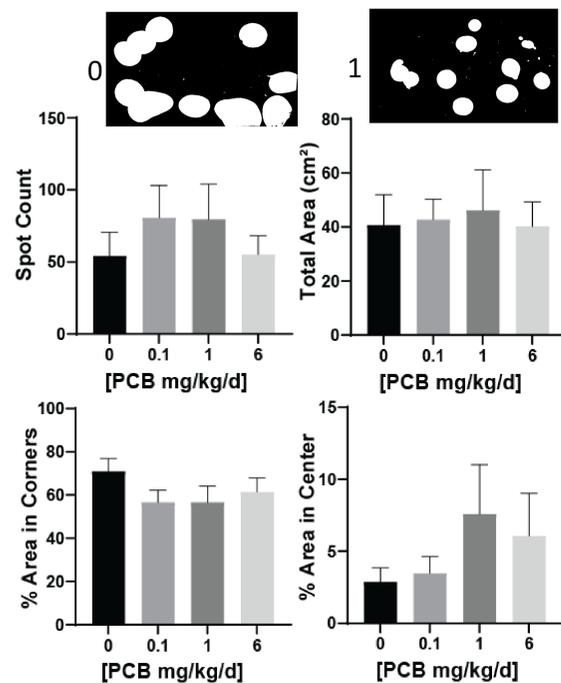


Figure 3: Following 4 hour VSA, spot count, total urine area, percent of voids in corners/center, and size distribution of voids was quantified. * indicates statistically significant result ($P \leq 0.05$) as determined by Kruskal-Wallis test followed by Dunn's multiple comparison test or one-way ANOVA. Data were transformed to restore normality if necessary.

Uroflowmetry—PCB exposure caused no significant differences in void mass, time, flow rate, stream rating, or void interval in adult female mice.

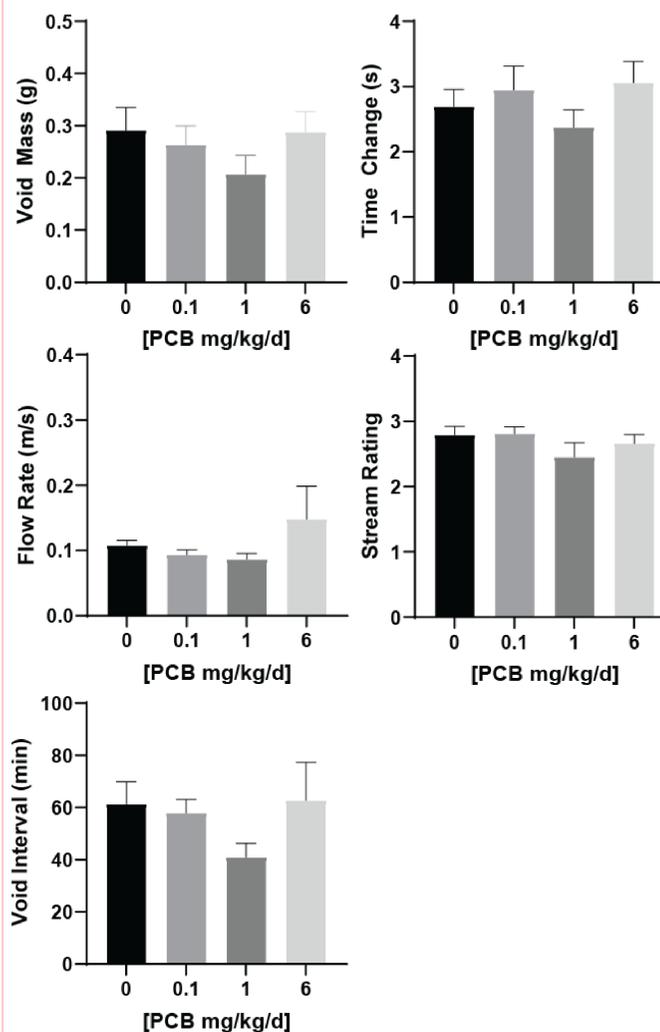


Figure 4: Uroflowmetry conducted on adult female mice exposed to PCBs for 55 days. Parameters examined after uroflowmetry include void mass, time change, flow rate, stream rating, void interval. No significant results ($P \leq 0.05$) as determined by Kruskal-Wallis test or one-way ANOVA.

Anesthetized Cystometry—PCB exposure caused no significant difference in intervoid interval, maximum void pressure, or compliance.

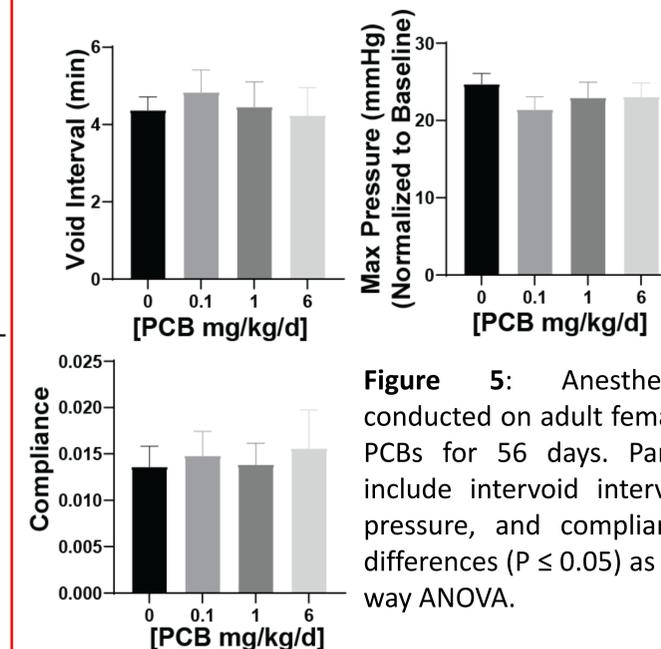


Figure 5: Anesthetized cystometry conducted on adult female mice exposed to PCBs for 56 days. Parameters examined include intervoid interval, maximum void pressure, and compliance. No significant differences ($P \leq 0.05$) as determined by one-way ANOVA.

Bladder Metrics—PCB exposure caused no significant difference in bladder mass or volume.

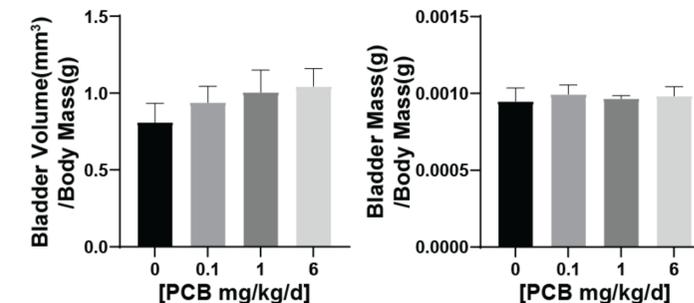


Figure 6: Bladder metric measurements of adult female mice not undergoing anesthetized cystometry. Parameters examined include bladder mass, bladder volume and body mass. No statistically significant result ($P \leq 0.05$) as determined by one-way ANOVA.

Conclusions

- PCB exposure does not alter dam reproductive ability.
- Limited effects of PCB exposure on adult female voiding physiology and bladder metrics when exposed for ~2 months in adulthood.
- Significant increase only between 1 mg/kg dose group and control group in number of 2-3 cm urine spots.