

POLYCHLORINATED BIPHENYLS AFFECT VOIDING PARAMETERS IN ADULT-EXPOSED MALE MICE

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Introduction

- Bladder dysfunction and lower urinary tract symptoms (LUTS) can affect quality of life
- LUTS are multifactorial – variation in age, progression, severity
- Voiding function can be influenced by environment
- Polychlorinated biphenyls (PCBs) are persistent environmental toxicants, affect human health at varying levels of exposure
- PCB effects on adult male voiding function is unknown

Our aim is to test the hypothesis that PCB exposure affects adult male voiding function.

Methods

DOSING

- 10 wk C57Bl/6J wild type male mice
- Peanut butter and peanut oil vehicle
- MARBLES PCB Mix: 0 mg/kg, 0.1 mg/kg, 1 mg/kg, 6 mg/kg
- Every day for 60 days

VOIDING PHYSIOLOGY TESTS

- Void Spot Assay (VSA)
- Uroflowmetry
- Cystometry
- Prostate & Testes collected after euthanasia

PCB exposure has no effect on the frequency of urine spots

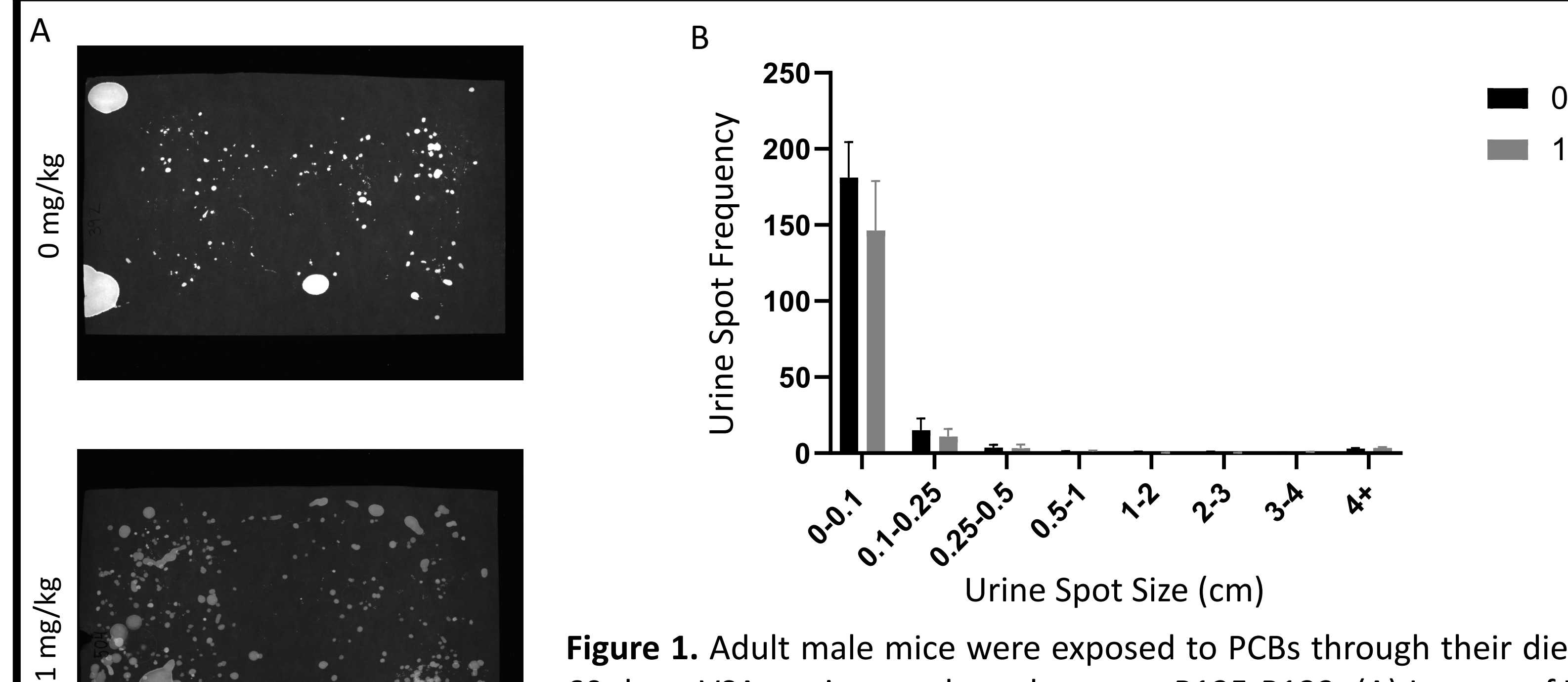


Figure 1. Adult male mice were exposed to PCBs through their diet for 60 days. VSA testing conducted on ages P125-P132. (A) Images of VSA. Parameters examined following the 4 hour testing period include (B) spot size distribution. Results are mean $\pm$ SEM, n=8. P values $\leq$ 0.05 as determined by (B) two-way ANOVA.

PCB exposure at the 1 mg/kg level alters flow rate in adult male mice

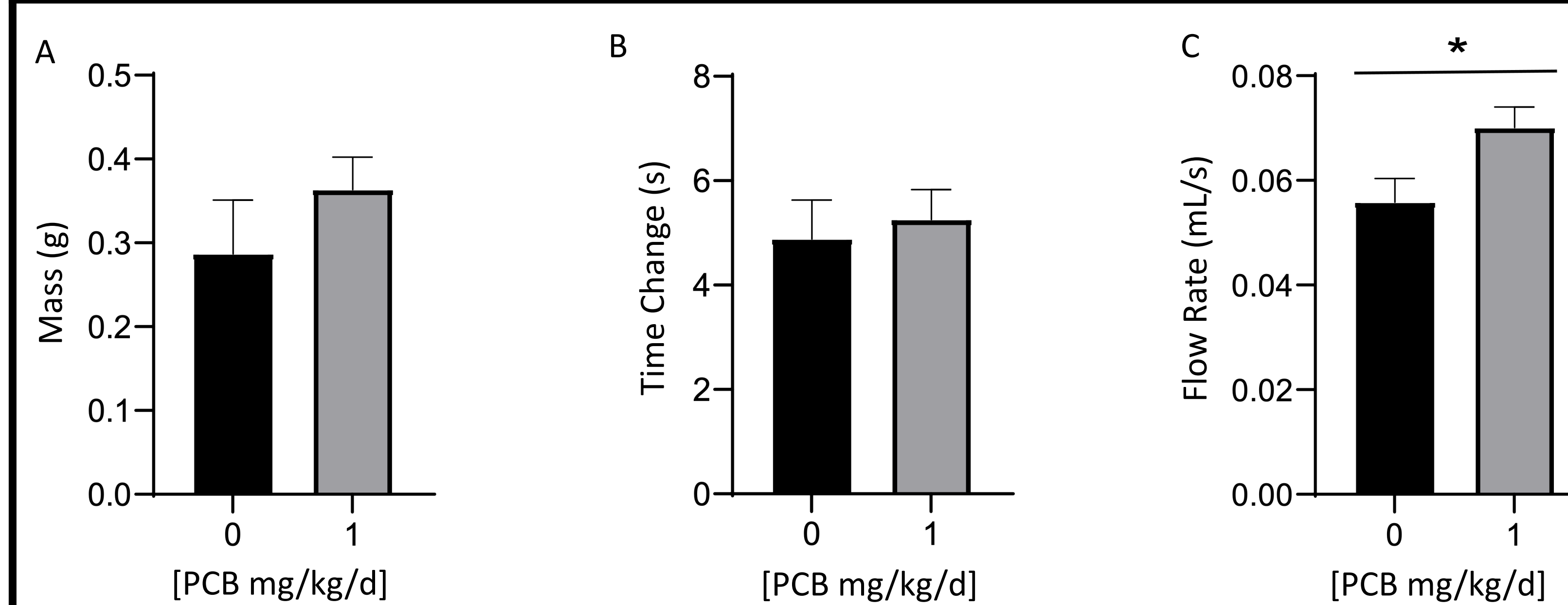


Figure 2. Adult male mice were exposed to PCBs through their diet for 60 days. Uroflowmetry conducted on ages P128-P133. Parameters examined following the 4 hour testing period include (A) mass of void events, (B) time change of void events, and (C) the flow rate of void events. Results are mean $\pm$ SEM, n=6-8. A bar and * indicate significant difference. P values $\leq$ 0.05 as determined by (A-C) unpaired t-test.

Exposure to PCBs has no effect on cystometry parameters

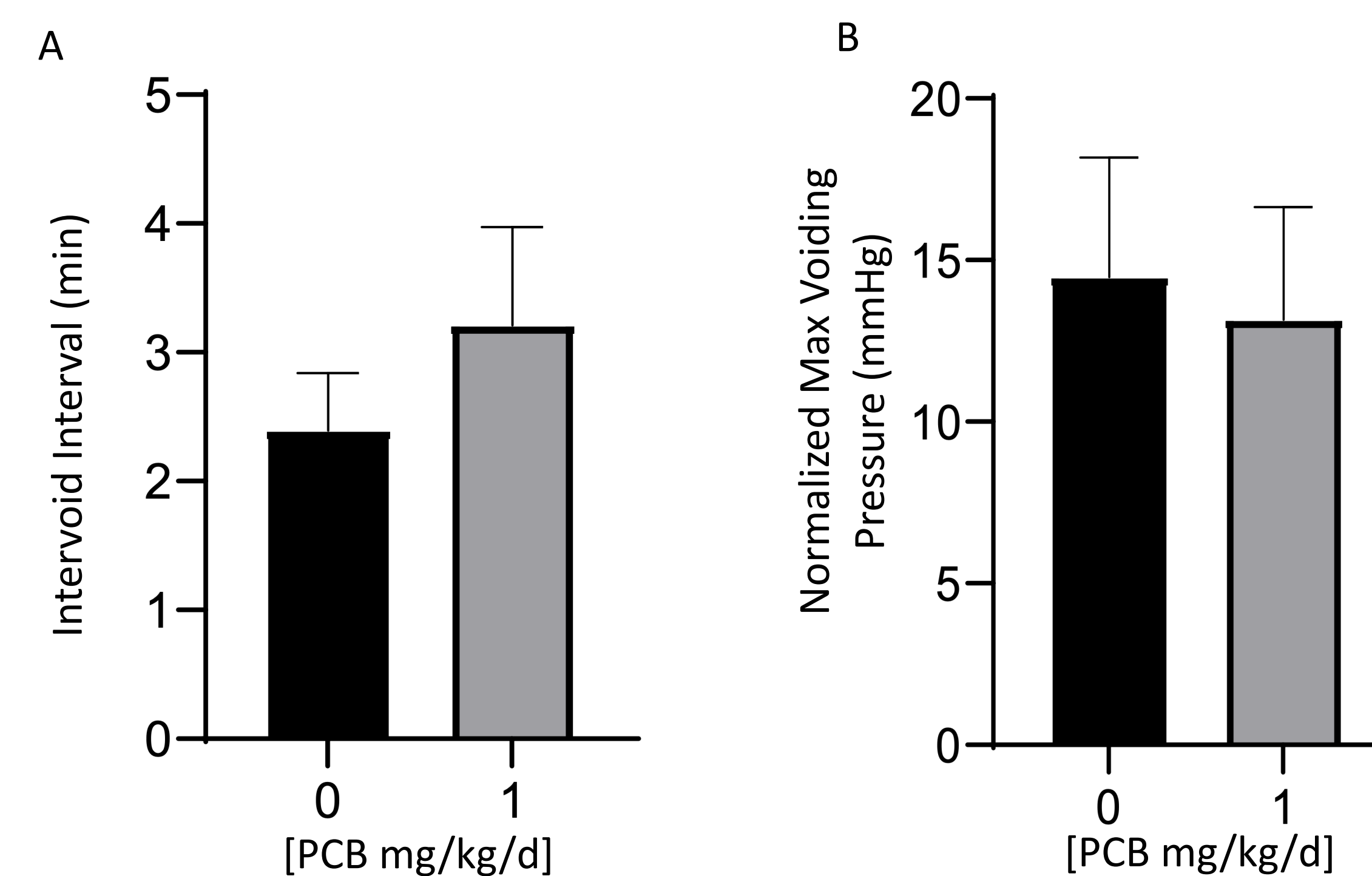


Figure 3. Adult male mice were exposed to PCBs through their diet for 60 days. Cystometry was conducted on adult male mice ages P130-P137. Parameters examined following the test period include (A) intervoid interval and (B) normalized max voiding pressure (maximum subtracted from baseline pressure). Results are mean $\pm$ SEM, n=6-7. P values $\leq$ 0.05 as determined by (A-B) unpaired t-test.

Ventral prostate mass increased after PCB exposure

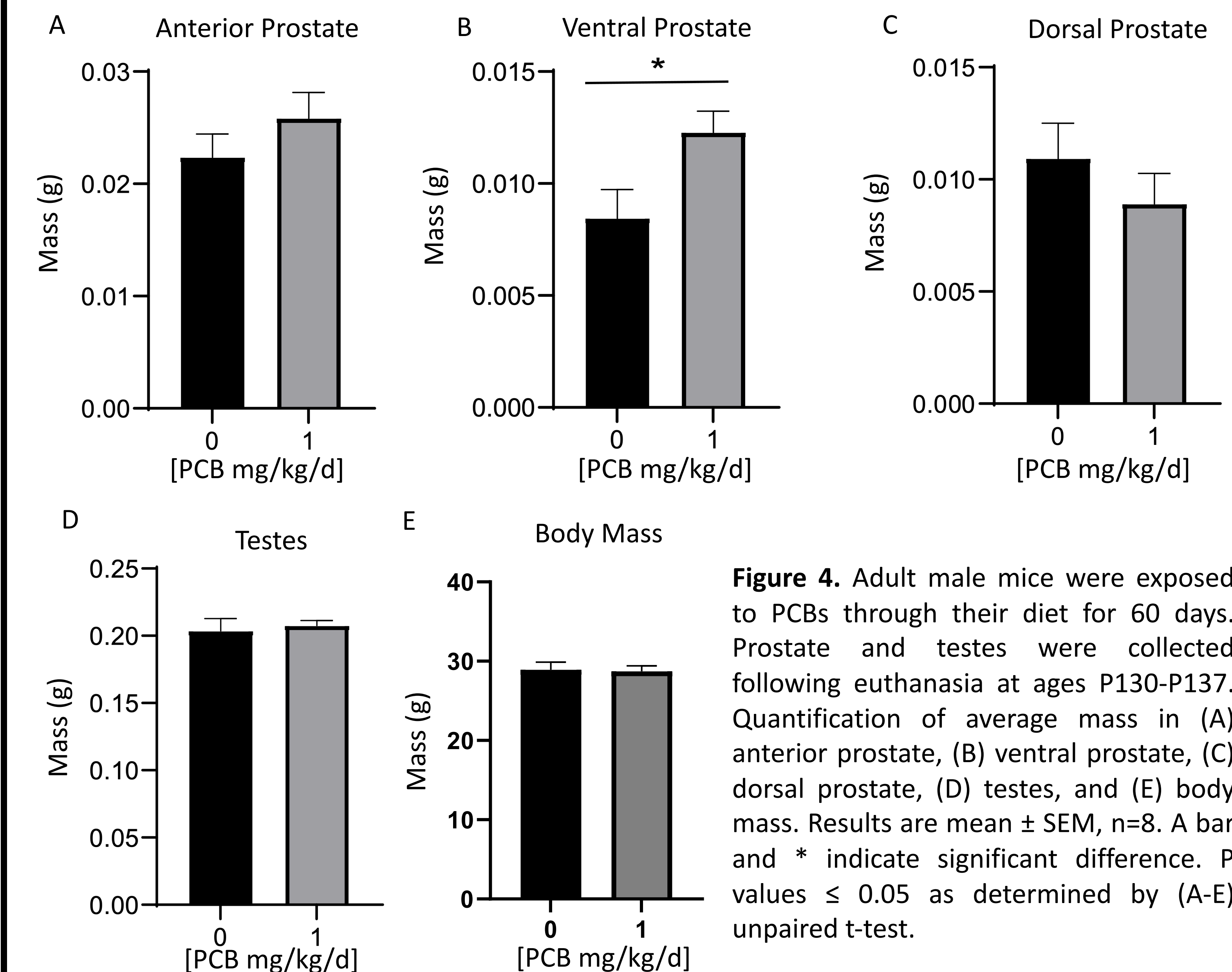


Figure 4. Adult male mice were exposed to PCBs through their diet for 60 days. Prostate and testes were collected following euthanasia at ages P130-P137. Quantification of average mass in (A) anterior prostate, (B) ventral prostate, (C) dorsal prostate, (D) testes, and (E) body mass. Results are mean $\pm$ SEM, n=8. A bar and * indicate significant difference. P values $\leq$ 0.05 as determined by (A-E) unpaired t-test.

Conclusions

- Increased flow rate could mean altered contractile properties – further confirm with bladder & urethra bath contractility assays
- Whether ventral prostate contributes to changes in flow rate is unclear
- Further study on the ventral prostate to determine what is driving the increase in mass is necessary
- Mice dosed at lower and higher dosage concentrations had no significant changes
 - Nonmonotonic dose response is commonly observed with PCBs, the mechanism driving this is not understood
- Overall, our study in adult male voiding phenotypes may be relevant into understanding LUTS in adult males, and this warrants future studies into PCBs as risk factors.
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