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### The Interrelationship of Bisphenols-A and -S, Lipid Profiles, and Their Effect on Glucose Uptake

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Bisphenol-A (BPA), a chemical used in food packaging, and its replacement, bisphenol-S (BPS), are established obesogens and have been closely associated with a risk of insulin resistance, dyslipidemia, and furthermore T2D. Physical exercise has been shown to attenuate these conditions. **PURPOSE:** To investigate the relationship between lipid profiles, levels of urinary BPA and BPS, and their influence on glucose uptake induced by insulin and aerobic exercise. **METHODS:** Eighteen healthy subjects (ages  $23.28 \pm 2.61$  yrs; BMI  $29.41 \pm 8.28$  kg/m<sup>2</sup>) participated in two, separate testing days. Participants fasted (only water) for 3-hours prior to each session. Before testing began, a urine sample was collected, and basal blood glucose, lipid profile, and body fat were also assessed. Participants then consumed a mixture of 8 ounces of water and 50 g of Maltodextrin. In the following 30-, 60-, and 75-minutes, the subjects' blood glucose was measured. On the "Exercise" testing day, subjects ran for 30-minutes on a treadmill, while on the "Rest" testing day, they remained seated. Urinary BPA and BPS were measured by an assay kit. **RESULTS:** The "Exercise" condition produced a significant decrease in blood glucose measures from 30- to 60-minutes ( $132.9 \pm 17.1$  vs  $80.9 \pm 19.5$  mg/dL;  $p = 00000000018$ ), returning to basal measures ( $81.8 \pm 8.9$  vs  $80.9 \pm 19.5$  mg/dL;  $p = 0.83$ ). The results of the correlation analyses yielded a significance between levels of BPS and triglycerides (TG) ( $r = 0.49$ ) and correspondingly TG/HDL ( $r = 0.50$ ). Correlation analyses also yielded a significance between body fat % and the glucose uptake measures in the "Exercise" ( $r = -0.51$ ) and "Rest" ( $r = -0.52$ ) protocols. There were no correlations between levels of BPA or any of the parameters assessed. **CONCLUSION:** The hypotheses that BPA would correlate with glucose uptake, lipid profile, BMI and percentage of fat were rejected. BPS was correlated with increased levels of triglycerides (TG) and the correspondingly the TG/HDL ratio, potentially lending support that BPS promotes obesogenic effects via a different pathway than BPA. This study produced strong evidence of a positive exercise effect on a hyperglycemic state as well as demonstrating that body fat % plays an essential role in influencing health risk.

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