

Association of Urinary Bisphenol A Concentration With Medical Disorders and Laboratory Abnormalities in Adults

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Background

Objective associations between urinary BPA concentrations and adult health status.

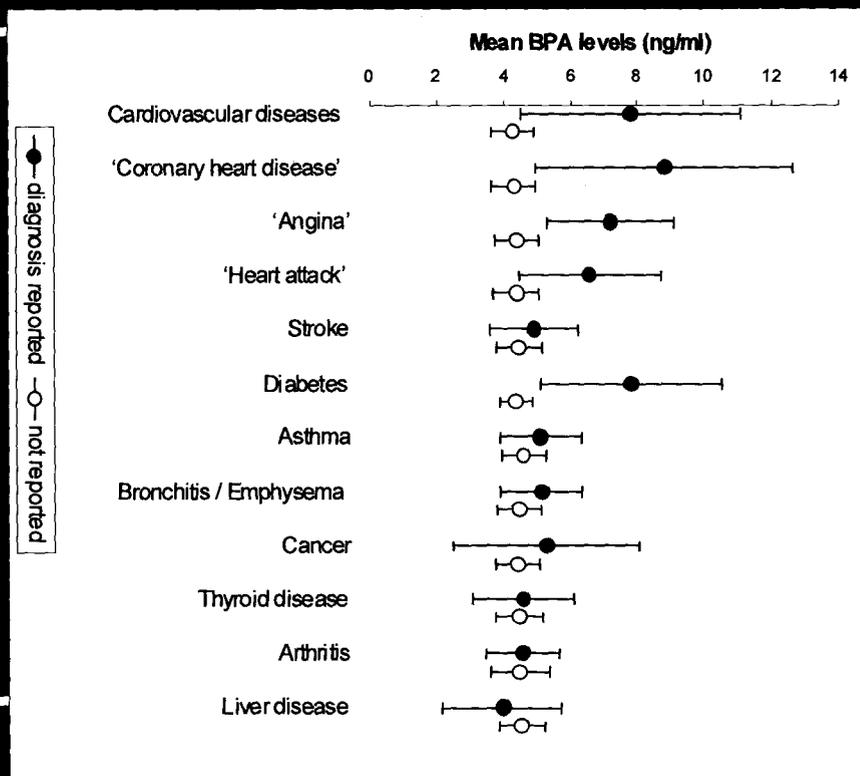
Design Cross-sectional analysis of the National Health and Nutrition Examination Survey (NHANES) 2003-04.

- *Setting* General adult population of the United States

Participants 1455 adults aged 18-74 yrs

- urinary BPA measured by CDC Atlanta

Figure 1. Estimated mean Bisphenol A levels in relation to reported conditions, adjusted for age and sex, with 95% confidence intervals



Fully adjusted models OR per 1-SD increase in BPA concentration

adjusted for:

- age, sex, race/ethnicity, education, income
- smoking, BMI & waist circumference,
- and urinary creatinine concentration

Cardiovascular disease n=79/1272

Odds Ratio = 1.39 (95% CI 1.18-1.53) p=0.001

Diabetes n=136/1455

Odds Ratio = 1.39 (95% CI 1.21-1.60) p < .001

No associations with other diseases

Associations with raised liver enzymes

Gamma-glutamyltransferase $p=0.001$)

Alkaline phosphatase ($p=0.01$)

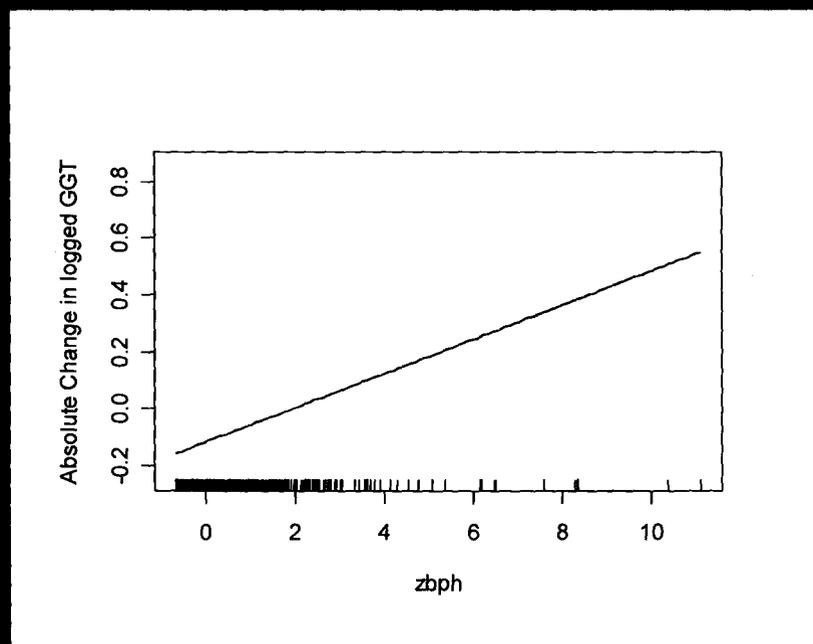
Lactate dehydrogenase ($p=0.04$)

- Associated with clinically abnormal levels of first two

Liver Enzymes

BPA levels – linear relationship with logged levels

spline point regression models of standardized BPA levels (zbph) against logged α -Glutamyl Transferase



Sensitivity analyses

Robust to:

Alternative weighting

removal of outliers

BPA/creatinine ratio, adjustment for urinary protein (albumin)

Liver enzyme changes still present after removing people with CVD/diabetes, adjustment for alcohol intake

Other phenols (4-tert-octyl phenol, triclosan)



Conclusions

In the NHANES 2003/4 sample of the US adult population,

higher urinary BPA concentrations are associated with:

- Two common diseases
- Clinically abnormal Liver enzyme levels

Need to:

Replicate – e.g. 2005/6 NHANES

Show that BPA predicts onsets of disease

Understand the mechanisms of effect



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