Research shows link between bisphenol A and disease in adults

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A research team from the Peninsula Medical School, the University of Exeter, the University of Plymouth and the University of Iowa, have found evidence linking Bisphenol A (BPA) to diabetes and heart disease in adults.

Their research paper is to be published in the *Journal of the American Medical Association* on Wednesday 17 September and it is the first time that evidence has emerged of the association between higher BPA levels and disease in adults.

BPA is a controversial chemical commonly used in food and drink containers. It has previously caused concerns over health risks to babies, as it is present in some baby's bottles.

BPA is used in polycarbonate plastic products such as refillable drinks containers, compact disks, some plastic eating utensils and many other products in everyday use. It is one of the world's highest production volume chemicals, with over 2.2 million tonnes (6.4 billion pounds) produced in 2003, with an annual growth in demand of between six and 10 per cent each year.

Many previous studies in laboratory animals have suggested that BPA is safe, but some laboratory studies have raised doubts. Experiments in which mice and rats were exposed to BPA have shown that higher doses of the chemical can lead to liver damage, insulin resistance, diabetes and obesity. The laboratory animal evidence is complicated and

controversial. Some scientists believe that BPA can disrupt the work done by hormones, especially oestrogen, but the full biological effects of BPA in humans is far from clear.

The research team analysed information from the US government's National Health and Nutrition Examination Survey (NHANES) 2003-2004, the only large-scale data available on BPA concentrations excreted in urine. The research team analysed the results for the 1455 adults aged between 18 and 74 years old for whom measures were available. This study group is representative of the general population of the USA.

The analysis found that the 25 per cent of the population with the highest BPA levels were more than twice as likely to have heart disease and/or diabetes, compared to the 25 per cent with the lowest BPA levels. Higher BPA levels were also associated with clinically abnormal liver enzyme concentrations.

While this study has identified a statistical association between BPA and adult diseases for the first time, much more research is needed. Future work needs to exclude the small possibility that the association is due to some other unstudied factor, or that people with these diseases somehow become more exposed to BPA. It is also unclear whether the liver enzyme changes are linked to liver damage.

Professor David Melzer, Professor of Epidemiology and Public Health at the Peninsula Medical School (Exeter, UK), who led the team commented: "Our study has revealed, for the first time, an association between raised BPA loads and two common diseases in adults. At the moment we can't be absolutely sure that BPA is the direct cause of the extra cases of heart disease and diabetes: if it is, some cases of these serious conditions could be prevented by reducing BPA exposure. This is therefore an exciting finding, but it is also just the first step in

understanding the role of BPA."

He emphasised that this new possible link does not detract from the existing health advice to people on how to prevent heart disease and diabetes.
Professor Melzer also praised the NHANES study and the US Division of Environmental Health Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention, who released these data for analysis by researchers.

Tamara Galloway, Professor of eco-toxicology from the School of Biosciences, the University of Exeter, added: "Our results illustrate how important human bio-monitoring programmes such as NHANES are in providing high quality information on the extent of human exposure to common chemicals such as BPA, allowing us to explore the relationship between exposure and health outcomes more fully."

Source: The Peninsula College of Medicine and Dentistry