CYREX® Laboratories

CLINICAL SPECIFICATIONS

BISPHENOL-A (saliva)

Chemical Found In:

Bisphenol A (BPA) is used to make polycarbonate polymers and epoxy resins, along with other materials used to make plastics, including water bottles and other food and beverage containers. Paper products, most notably thermal receipt paper, have now been shown to also contain significant amounts of BPA.

Associated With:

Loss of oral tolerance

Known Cross-Reactions:

Clinical Significance:

The presence of salivary antibodies to Bisphenol A (BPA) bound to human protein indicates a breakdown in immunological tolerance and induction of chemical intolerance. Generally, the primary source of BPA exposure is thought to be from food or beverages that contain BPA, which has leached from food containers or drinking bottles.[4] Dental procedures have also shown an increase in BPA levels.[5] Once infiltrating the human body, BPA or its metabolites can bind to human tissue proteins and form neo-antigens. These new antigens are comprised of the haptenic chemical plus the tissue antigen. The formation of neo-antigens initiates an immune response which may result in antibody production against the chemical and the human tissue. Continued exposure to the chemical and the subsequent production of antibodies against various tissue antigens, may result in autoimmune reactivity. BPA functions as a xenoestrogen by binding strongly to estrogen-related receptor γ (EER-γ).[2] In adults, BPA is eliminated from the body through a detoxification process in the liver; however, in infants and children, the pathway is not fully developed, which prevents them from clearing BPA from their systems.[1] In a rat study, significant, in vitro, inhibition of BPA detoxification was found with nine drugs including naproxen, salicylic acid, carbamazepine and mefenamic acid.[3] Persons with salivary antibodies to BPA bound to human proteins should avoid exposure to the substance, with special attention taken to clean up the home and work environments.

Suggested Reading:

1. Beronius, et al. Risk to all or none? A comparative analysis of controversies in the health risk assessment of bisphenol A. Reprod Toxicol, 2010; 29(2):132-146.
2. Matsushima, et al. Sturctural evidence for endocrine disruptor bisphenol A binding to human nuclear receptor ERR gamma. Biochem, 2007; 142(4):517-524.
3. Verner, et al. High concentrations of commonly used drugs can inhibit the in vitro glucuronidation of bisphenol A and nonylphenol in rats. Xenobiotica, 2009; 40(2):83-92.
4. Wilson, et al. An observational study of the potential exposures of preschool children to pentachlorophenol, bisphenol-A, and nonylphenol at home and daycare. Environ Res, 2007; 103(1):9-20.
5. Kingman, et al. Bisphenol A and other compounds in human saliva and urine associated with the placement of composite restorations. JADA, 2012; 143(12):1292-1302.