

Abstract

Bisphenol A (BPA) is important in the pathomechanism of the formation of many diseases, such as cancer, reproductive system disorders, diabetes, obesity, and mental illness (especially children).

The aim of this study was to investigate whether there would be changes in the amount and coding in intrahepatic fibers after administration of BPA. Changes in chemical coding of intrahepatic nerves of sympathetic and parasympathetic origin in large animal model after administration of low (E1) and high doses (E2) of bisphenol A were investigated. The chemical coding for sympathetic and parasympathetic intrahepatic nerve fibers has been investigated using double and single immunofluorescence staining techniques using dopamine- β -hydroxylase antibodies (DBH; sympathetic marker), cocaine-and-amphetamine-regulated transcript (CART), substance P (SP), Calcitonin derived gene peptide (CGRP), galanin (GAL), pituitary adenylate cyclase (PACAP) polypeptide, and vesicular acetylcholine carrier (VACHT; parasympathetic marker). Based on the conducted studies, it was found that both groups of experimental animals were observed to change the chemical coding of intrahepatic nerve fibers of sympathetic and parasympathetic origin. After administration of a low and high dose of bisphenol A, a statistically significant increase in the number of intrahepatic sympathetic fibers, $\text{DBH}^+/\text{CART}^+$, $\text{DBH}^+/\text{GAL}^+$ and parasympathetic $\text{VACHT}^+/\text{CART}^+$, $\text{VACHT}^+/\text{GAL}^+$, was observed. In the case of nerve fibers DBH^+/SP^+ and $\text{VACHT}^+/\text{SP}^+$, no significant changes in their number were observed in both groups. In the case of $\text{DBH}^+/\text{CGRP}^+$ fibers, statistically significant changes were observed in the E2 group. The studies have demonstrated for the first time that both low and high doses of bisphenol A affect the chemical coding of intrahepatic fibers, which can lead to changes at the level of the organ's physiology.

Key words: bisphenol A, animal model, chemical coding, liver, parasympathetic and sympathetic innervation,