

# An endocrine disrupting chemical, bisphenol A: Could it be associated with sex differentiation in brain regarding to transexuality?

Banu Sarer Yurekli, Nilufer Ozdemir Kutbay, Fusun Saygili

Ege University, Department of Endocrinology, Izmir, Turkey

## HYPOTHESIS

Transsexuality is characterized by a belief of having been born in a wrong body. Sexual differentiation of genitals take place in the first two months of pregnancy. Sexual differentiation of brain takes place in the second half of pregnancy. It is found that there is structural sex differences in the central nucleus of the bed nucleus of the stria terminalis (BSTc). Structural differences were found to be reversed in transsexual people. In humans main mechanism appears to involve a direct effect of testosterone on the developing brain. Direct effect of testosterone on developing brain in boys and lack of this effect in girls are crucial factors in the development of male and female gender identity.

The origin of transsexuality is based on the fact that the differentiation of sexual organs takes place before the sexual differentiation of the brain. It was found a reversal in BSTc. In men this area is twice the size of that in women. In male-to-female transsexuals they found female BSTc. They had shown that sex reversal of the differences in the BSTc were independent of changing hormone levels in adulthood. The size of BSTc and the number of neurons match the gender that transsexuals feel they belong to, not the sex of their sexual organs. An endocrine disrupting chemical (EDC), bisphenol A (BPA), acts as estrogen mimic compound. BPA may affect sexual differentiation of brain and cause reversal of differentiation in male to female transsexual as female brain. Brain expresses the estrogen receptors and other hormone receptors making it a potential target for EDC.

## CONCLUSION

Transsexuality presume a combination of a genetic background and an early effect on interaction of sex hormones with developing brain during critical fetal period. We hypothesize that exposure to BPA may be a cause for transsexualism