Exposure to Endocrine Disrupting Compounds from Personal Care Products: Can be Reduced?

Heba Shaaban*

Department of Pharmaceutical Chemistry, College of Clinical Pharmacy, University of Dammam, Saudi Arabia

Editorial

Endocrine disruptors are compounds that can interfere with the body's endocrine system at certain doses causing serious health problems. These exogenous agents interfere with the synthesis, secretion, transport, binding, action, or elimination of natural hormones in the body that are responsible for the maintenance of homeostasis, reproduction, development, and/or behavior [1]. In the last two decades there has been a growing awareness of the potential negative impacts of the exposure to endocrine disruptors, as these compounds may cause developmental malformations, infertility, increased cancer risk, neurological disorders and disturbances in the immune and system function [2-4]. Endocrine disruptors represent a broad class of compounds such as heavy metals, polychlorinated biphenyls, polyfluorinated compounds, bisphenol A, phthalates, benzophenones, parabens and brominated flame retardants [1].

People come into contact with endocrine disrupting compounds by a variety of routes including oral consumption of contaminated food or water, dermal contact of some cosmetics, personal care products, anti-bacterials and sunscreens, inhalation of hairsprays and fragrances, biological transfer from placenta or from mother's milk (if a woman has EDCs in her body) [1,4]. The emergence of a large number of manufactured products in the last century has resulted in an increased exposure of the general population to a wide variety of xenobiotics that can cause adverse health effects. Several analytical methodologies have been developed for the determination of endocrine disruptors in different matrices [5,6]. The detection of endocrine disruptors in serum, fat, urine, blood and other tissues in human at trace levels is also well documented in the literature [7-12].

Recent studies revealed that there is a correlation between the urinary level of parabens, phenols and phthalate metabolites; and the consumption of cosmetics and personal care products e.g. [9,11]. The results of these studies suggest that the use of personal care products is an important source of exposure to endocrine disruptors in adults and children.

It is obvious that complete elimination of exposure to endocrine disruptors is impossible as they can be found in food, water, air and everyday products, however the exposure to such chemicals can be minimized by simply changing our lifestyle. For example, Chung-Yu Chen et al. [11] developed an intervention trial to reduce the potential exposure to phthalates in Taiwanese girls. The intervention strategy involved increasing the hand washing, prevention of using plastic containers or eating food with a plastic bag/plastic-wrap cover, elimination of microwaving food or taking nutrition supplements, and reducing use of cosmetics or personal care products. In this study, urine samples from thirty girls who had been exposed to high levels of phthalates were collected and analysed before and after the intervention (one week). The study concluded that increasing washing frequency and using less shampoo reduced the levels of mono-n-butyl phthalate, however the prevention of drinking from plastic cups reduced the urinary levels of di (2-ethylhexyl) phthalate and mono-n-butyl phthalate levels. Another study showed that the use of parabens and phthalates free personal care products for only three days could result in dramatic decrease of the urinary concentrations of methyl and propyl paraben by 43.9% and 45.4%, respectively. Also, the levels of mono-ethyl phthalate and triclosan were decreased by 27.4%, and 35.7%, respectively [12]. These results indicate that consumer choices can affect exposures to endocrine disruptors.

Further biomonitoring studies on the levels of exposure to endocrine disruptors and on the predictors of exposure in different populations worldwide are highly needed, with special attention to developing countries where exposure to these compounds remains poorly characterized. Also, there is an urgent need for an international harmonization on how the safety of these products and their ingredients should be evaluated.
References


