

Editorial

Endocrine Disruptors: A Reproductive Health Concern

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EDITORIAL

Endocrine disrupting chemicals (EDCs) are the compounds which interfere with the normal functions of endocrine system. These are found in variety of products some of which include shaving creams, tooth brushes, nail polishes, deodorant, shampoos, toys, soaps, textiles, fertilizers and plastics [1,2]. Due to the wide spread of EDCs in consumer products, humans are exposed to them every day. The exposure to these compounds occurs through ingestion, inhalation or dermal contact. Although these compounds are metabolized into their downstream metabolites; unfortunately the metabolites may turn to be more dangerous than their parent compounds. The exposure of human body to such compounds starts during in utero life the time when physiological levels of sex hormones are essential in the descendance of gonads. EDCs interfere with the synthesis as well functioning of the androgens which can result in cryptorchidism and hypospadias [3]. In utero exposure of EDCs has also been associated with shorter anogenital distance and reduction in the gestational age [4]. As a result of this high exposure every 1 in 250 new borns shows signs of developmental and functional abnormalities of the gonads [5]. Over the years a decrease in the ratio of male to female offspring has been reported and this decline is shown to have possible linkage with EDCs exposure and their interference with androgens activity [6]. Neonatal exposure to EDCs has also shown a decline in testosterone levels which possibly causes down regulation of the genes responsible for steroid synthesis [7]. Even if an individual is born completely healthy the risk of exposure to EDCs still poses serious health concern. In adult female population the high levels of these compounds have been reported in endometriosis women compared to normal [8]. Similarly a decline in sperm qualitative as well as quantitative parameters has been shown in cases of higher EDCs levels. For example the exposure to pesticides which are common sources of EDCs results in lower semen volume, reduced sperm motility, concentration, and high abnormal morphology [9,10].

In the context of above reports the issue of human exposure to EDCs has become a global challenge. Due to the extensive usage of these compounds in daily consumable products human health particularly reproductive health is at risk. Some EDCs are more dangerous and even carcinogenic in nature than the others. For example bisphenole A (BPA) which is considered the most harmful EDC is extensively used in plastics and food packaging

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Submitted: 27 November 2017

Accepted: 28 November 2017

Published: 29 November 2017

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materials. Although some countries such as European Union has banned the use of BPA; several developed countries and most of the developing countries are still using this in the manufacturing of plastics and food packaging materials. Another family of EDCs called phthalates has extensive utilization in personal care and children products, medical tubing, food packaging and plastics. Dioxins and PCBs are two other common examples which have shown adverse human health effects including cancer, nervous system abnormalities and infertility. Their use has been restricted over the years but still low levels are found in daily usable products which are harmful. The concern of humans to EDCs exposure is a serious matter in developing countries where regulations to control the use of such compounds either do not exist or observe poor implementation.

Caution must be taken when using products in daily life because the complete escape from these compounds has become almost impossible. The right precautions can minimize the exposure to these compounds. Therefore, frequent washing of hands especially before meal should be observed. Soaps with minimal fragrance should be used and pregnant women must minimize utility of deodorants and perfumes. Since pesticides are the potential source of EDCs, organic food is the ideal choice. Canned food should be the last option in the list and fresh organic products must be preferred. When buying feeding bottles for the children always BPA free material should be chosen. Carpets and in house floors should be cleaned more often as several harmful chemicals from electric appliances, sofa, furniture and children products can accumulate in house hold dust. Use of plastic bottles should be avoided and replaced with either glass or stainless steel.

More importantly we should look for the alternatives to EDCs. Unfortunately there are not much alternate options available. Several alternatives to phthalates (ATBC, DINCH, DOTP, ASE, ESBO, TETM) have been introduced but the data about their long term use and the safety of human health is scarce. These alternatives are not chemically bound to the polymer and leach out from the product easily. Taken together, strict policies should be formulated and more research on the alternatives to the EDCs should be conducted before commercializing these compounds.

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Cite this article

Ahmad G (2017) Endocrine Disruptors: A Reproductive Health Concern. *JSM Invitro Fertil* 2(3): 1023.