notizie dagli USA: antiandrogeni e sostanze antifertilità maschile

An updated review of environmental estrogen and androgen mimics and antagonists.

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For the last 40 y, substantial evidence has surfaced on the hormone-like effects of environmental chemicals such as pesticides and industrial chemicals in wildlife and humans. The endocrine and reproductive effects of these chemicals are believed to be due to their ability to: (1) mimic the effect of endogenous hormones, (2) antagonize the effect of endogenous hormones, (3) disrupt the synthesis and metabolism of endogenous hormones, and (4) disrupt the synthesis and metabolism of hormone receptors. The discovery of hormone-like activity of these chemicals occurred long after they were released into the environment. Aviation crop dusters handling DDT were found to have reduced sperm counts, and workers at a plant producing the insecticide kepone were reported to have lost their libido, became impotent and had low sperm counts. Subsequently, experiments conducted in lab animals demonstrated unambiguously the estrogenic activity of these pesticides. Man-made compounds used in the manufacture of plastics were accidentally found to be estrogenic because they fouled experiments conducted in laboratories studying natural estrogens. For example, polystyrene tubes released nonylphenol, and polycarbonate flasks released bisphenol-A.

Alkylphenols are used in the synthesis of detergents (alkylphenol polyethoxylates) and as antioxidants. These detergents are not estrogenic; however, upon degradation during sewage treatment they may release estrogenic alkylphenols. The surfactant nonoxynol is used as intravaginal spermicide and condom lubricant. When administered to lab animals it is metabolized to free nonylphenol. Bisphenol-A was found to contaminate the contents of canned foods; these tin cans are lined with lacquers such as polycarbonate. Bisphenol-A is also used in dental sealants and composites. We found that this estrogen leaches from the treated teeth into saliva; up to 950 microg of bisphenol-A were retrieved from saliva collected during the first hour after polymerization. Other xenoestrogens recently identified among chemicals used in large volumes are the plastizicers benzylbutylphthalate, dibutylphthalate, the antioxidant butylhydroxyanisole, the rubber additive p-phenylphenol and the disinfectant o-phenylphenol. These compounds act cumulatively. In fact, feminized male fish were found near sewage outlets in several rivers in the U.K.; a mixture of chemicals including alkyl phenols resulting from degradation of detergents during sewage treatment seemed to be the causal agent. Estrogen mimics are just a class of endocrine disruptors. Recent studies identified antiandrogenic activity in environmental chemicals such as vinclozolin, a fungicide, and DDE, and insecticide. Moreover, a single chemical may produce neurotoxic, estrogenic and antiandrogenic effects. It has been hypothesized that endocrine disruptors may play a role in the decrease in the quantity and quality of human semen during the last 50 y, as well as in the increased incidence of testicular cancer and cryptorchidism in males and breast cancer incidence in both females and males in the industrialized word. To explore this hypothesis it is necessary to identify putative causal agents by the systematic screening of environmental chemicals and chemicals present in human foods to assess their ability to disrupt the endocrine system. In addition, it will be necessary to develop methods to measure cumulative exposure to

(a) estrogen mimics, (b) antiandrogens, and (c) other disruptors.