

В цей непростий для нашої країни час, перед системою охорони здоров'я постали нові, сформовані повномасштабним військовим вторгненням, виклики. Особливої уваги заслуговує гармонізація принципів європейських систем охорони здоров'я і особливо їх профілактичної складової, направленої на зміцнення здоров'я людини через його соціальні, економічні, детермінанти, включаючи не лише питання безпеки харчових продуктів, умов праці та способу життя, профілактики інфекційних і неінфекційних хвороб але й задоволення його соціальних, культурних та інформаційних потреб.

Перед науковою спільнотою всього світу, медичної галузі України та, зокрема, Національного медичного університету імені О.О. Богомольця є низка викликів. Суспільство потребує наукової підтримки правових, організаційних, економічних та соціальних засад функціонування систем охорони здоров'я з метою зміцнення здоров'я населення, запобігання хворобам, покращення якості та збільшення тривалості життя, нові рішення нагальних питань щодо впливу бойових дій на здоров'я населення та стан довкілля, розвиток нових технологій лікування та діагностики. Перед нами багато шляхів розвитку, але наше завдання рухатись науковими лабіринтами гідно представляючи бренд НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ імені О.О. Богомольця в світовому науковому та освітянському середовищі.

ENDOCRINE DISTURBERS AN UNDERESTIMATED PUBLIC HEALTH PROBLEM IN THE REPUBLIC OF MOLDOVA

Roman Corețchi

National agency for Public Health Republic of Moldova

University of medicine and pharmacy "Nicolae Testemitanu" Republic of moldova

Introduction

One of the main factors in endocrine damage is attributed to exposure to chemicals that affect the endocrine system. Endocrine disruptors causes adverse effects on morphological conditioning, physiological state, life expectancy, growth, development, reproduction of an organism and its offspring, also contribute to increased susceptibility to other risk factors.

Endocrine disrupting chemicals represent a global public health problem, because humans can be exposed to the impact of these substances through products used every day, including food, cosmetics, agricultural products, pharmaceutical products, medical equipment, implants, medical devices, packaging materials, plastic products, as well as industrial chemicals, persistent organic pollutants, pesticides and fertilizers, flame retardants in various products[2]. At the same time, people may be exposed to endocrine disruptors through ingestion of food and water, inhalation of gases and particles from the air and through the skin. These substances can pass through the placenta from a pregnant woman to the developing fetus or through breast milk to the baby. It should be noted that endocrine disruptors have the same characteristics as natural hormones and can often interfere with all processes controlled by hormones. Additionally, a major risk for public health is the simultaneous exposure to different chemicals with effect on the endocrine system,

such exposure can cause combined effects, known as "cocktail effects". Another characteristic of endocrine disruptors is the delayed effects and transgenerational effects, exposure to a certain substance that may cause disease in the future or predispose the offspring to certain diseases.

Materials and methods

International and national issues and achievements in the field of endocrine disruptors were studied and analyzed, performing an advanced literature search. There were analyzed results of scientific studies, recommendations of international organizations and articles published in specialized journals.

Results and discussion

According to the data published by the World Health Organization (WHO) in collaboration with the United Nations Environment Program (UNEP), there is an worldwide increase in endocrine system diseases, such as the incidence of genital anomalies in boys through cryptorchidism and hypospadias, in several countries record premature births and low birth weight, neurobehavioral disorders associated with thyroid disorders affecting a large number of children, hormone-dependent cancer (breast, ovarian, testicular, thyroid, endometrial and prostate cancer), as well as the prevalence of obesity and type 2 diabetes II, in recent decades [3].

The main evidence suggesting that exposure to environmental chemicals can disrupt endocrine functions comes from observed changes of wild species. Numerous studies report endocrine disruption in molluscs, crustaceans, fish, reptiles, birds and mammals from different parts of the world. There is also evidence of adverse endocrine effects in humans due to intentional or accidental exposure to certain chemicals. According to the US National Institute of Environmental Health Sciences (NIEHS), the distinct example of endocrine disruption in humans was caused by diethylstilbestrol (DES), a synthetic estrogen prescribed in the 1950s and 1960s to five million women US to prevent miscarriage. It was found that some of the children exposed in the womb to DES had developmental abnormalities. Some of girls developed an unusual form of vaginal cancer when they reached puberty. Consequently, DES was banned in the 1970s [1]. In 1980, male alligators living in the lake were observed to have smaller genitalia, abnormal gonad structure, and levels of reduced serum testosterone following the accidental spill of large amounts of dichlorodiphenyltrichloroethane (DDT) and dicofol from a chemical company into Lake Apopka in Florida [5]. The effects of DDT and dichlorodiphenylethane (DDE) on pubertal development have been investigated in several studies, through which effects on estrogen imbalance have been demonstrated [4]. As a result, DDT and its metabolites, previously widely used as pesticides in agriculture, have been banned in many countries, including the Republic of Moldova. Increasing epidemiological evidence suggests that exposure to endocrine disruptors may contribute to the development of type 2 diabetes. Studies report an increased risk after exposure to arsenic, some flame retardants as well as persistent organic pollutants (POPs), including polychlorinated biphenyls (PCBs), DDE, dioxin, organochlorine pesticides and hexachlorobenzene [6]. Another study records in Switzerland over two decades suggests an increased risk for cancer among children whose parents were exposed to

pesticides [8]. In terms of health economics, the burden of these substances in the USA and Europe alone is estimated to exceed \$550 billion annually [7].

Currently, this group of substances is little studied and in frequent cases underestimated in the Republic of Moldova. It is a fact that endocrine disruptors cause a major increase of morbidity in population. The prevalence of cases of endocrine, nutrition and metabolism diseases is constantly increasing, from 2011 to 2021. The prevalence indicator increased from 40 to 108.4 cases registered per 1000 inhabitants. This group of diseases has a major socioeconomic impact, conditioned by big expenses for the maintenance and treatment of the sick.

Based on the above, this is why we must remain vigilant and strengthen capacities to reduce the risk caused by endocrine disruptors to the population, by developing national strategies on endocrine disruptors based on international best practices, which will include 4 fundamental objectives:

1. Research, development and monitoring;
2. Substance expertise;
3. Regulation and replacement of endocrine disruptors;
4. Training specialists and informing the population.

Conclusions

1. Endocrine-disrupting chemicals are a global public health problem, because humans can be exposed to the impacts of these substances through everyday products.

2. Exposure to endocrine disruptors causes a wide range of health problems, including reproductive, fetal developmental, neurological, immunological, metabolic and cancer disorders.

3. Scientific communities, authorities and experts of developed countries, international organizations and specialized agencies, in recent decades, have been putting a lot of effort into research, identification, monitoring, expertise, regulation and development of strategies to prevent adverse effects on public health caused by endocrine disruptors.

4. There is an urgent need to develop national strategies on endocrine disruptors based on international best practices.

Bibliography

1. National Institute of Environmental Health Sciences. Endocrine Disruptors. <https://www.niehs.nih.gov/health/topics/agents/endocrine/index.cfm> (10 October 2022, data last accessed)

2. Sandeep Kumar Dhiman, Harish Duration. Significance of and Challenges in Regulating Endocrine Disruptors – How Regulators and Industry Can Conquer? Endocrine, Metabolic & Immune Disorders - Drug Targets. Volume 20, Issue 10, 2020: 1664-1681. doi: 10.2174/1871530320666200606225104

3. Nations report Environment Programme: "State of the Science of Endocrine Disrupting Chemicals – 2012" <https://wedocs.unep.org> (10 October 2022, last date accessed)

4. Reddy BS, Rozati R., BVR Reddy BVR, Raman NVVSS Association of phthalates esters with endometriosis in Indian women," BJOG: An International Journal of Obstetrics & Gynecology, vol. 113, no. 5, pp. 515–520, 2006. doi: 10.1111/j.1471-0528.2006.00925.x