



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.2677992>
Available online at: <http://www.iajps.com>

Research Article

PATHOGENETIC MECHANISMS AND PREVENTION OF RADIATION DAMAGE TO ORGANS AND TISSUES OF THE ORAL CAVITY

¹Mironov S.N., ²Al' Huri S.F., ¹Kuznetsov I.I., ¹Yablokova N.V.¹I.M. Sechenov First Moscow State Medical University (Sechenov University)²Family Dentistry "Good crocodile"

Article Received: March 2019

Accepted: April 2019

Published: May 2019

Abstract:

Today it has been proven that the basis of the damaging effects of radionuclides entering the body is the transfer of energy to target tissues. Such lesions, in contrast to radiation sickness resulting from external gamma irradiation, are characterized by a weak severity of the primary reaction, the early appearance of dysfunction of critical organs, a slow course of recovery processes, a more pronounced long-term pathology.

The issues of rehabilitation of children exposed to radiation in Russia began to deal with almost immediately after the Chernobyl accident. The system of special medical and preventive events which included was developed and approved: elimination of radionuclides from the child's organism, decrease of the activity of free radical processes, immunocorrective therapy, the differentiated methods of prevention of progressing of a disease and the three-level system of medical examination.

Key words: *Radiation Damage, Dental Status, Oral Cavity.*

Corresponding author:**Sergey Mironov,**

Department of Propedeutics of Dental Diseases in Sechenov University.

Email: snmironov@mail.ru

QR code



Please cite this article in press Sergey Mironov et al., *Pathogenetic Mechanisms And Prevention Of Radiation Damage To Organs And Tissues Of The Oral Cavity.*, Indo Am. J. P. Sci, 2019; 06(05).

INTRODUCTION:

Today it has been proven that the basis of the damaging effects of radionuclides entering the body is the transfer of energy to target tissues. Such lesions, in contrast to radiation sickness resulting from external gamma irradiation, are characterized by a weak severity of the primary reaction, the early appearance of dysfunction of critical organs, a slow course of recovery processes, a more pronounced long-term pathology [1]. This work was done at Sechenov University with supported by the "Russian Academic Excellence Project 5-100".

Embryos of mammals and humans are especially sensitive to the effects of radiation. The experiment shows the effect of low doses of ionizing radiation on odontogenesis in animals, when the proliferative activity of the tooth germ cells is significantly inhibited, the mitotic index decreases, the area of the enamel organ changes as much as possible [2].

Works on studying of a condition of micro ecological wellbeing of a mucous membrane, bacteriological and virologic researches of oral liquid at the children who are in conditions of radiative effects were not carried out. At the same time, at similar researches of smears from a pharynx at children certificates on prevalence of fungal flora and contamination by a herpes simplex virus at living in radiation the polluted areas are received.

One of the main ways of realization of the damaging action of radiation is the intensification of free radical processes which course can have long stage of latency. In literature results of researches of antioxidant activity of saliva at chronic recurrent aphthous stomatitis, a system hypoplasia of enamel of teeth, a chronic generalized periodontal disease appeared [3]. At the same time, the problem of free radical processes and antioxidant protection in saliva at radiative effects remains poorly studied.

In works of a number of authors importance of assessment of factors of individual radio sensitivity at a research of indicators of somatic incidence of the population of the regions which underwent radiation pollution as a result of accident on the CNPP is emphasized. For characteristic of hypersensitivity to influence of small doses of radiation groups of the markers determining depth and expressiveness of defeat are allocated. Identification of vegetative mutations and aberration chromosomes allows to establish dose load of the acting agent. Studies have proven the constant high sensitivity of the genetic material of blood lymphocytes in children, especially

those who have undergone intrauterine irradiation and in the prepubertal and pubertal periods.

The use of markers of hypersensitivity of the body to radiation exposure at preclinical stages for diagnostic purposes allows us to identify a group of children at increased risk of developing radiation ecopathology. Thus, when analyzing the dental incidence of the population of the regions of the Chernobyl zone, it was found that it is necessary to take into account not only the degree of soil contamination with radionuclides, but also the factors of individual radio sensitivity [4].

The issues of rehabilitation of children exposed to radiation in our country began to deal with almost immediately after the Chernobyl accident. The system of special medical and preventive events which included was developed and approved: elimination of radionuclides from the child's organism, decrease of the activity of free radical processes, immunocorrective therapy, the differentiated methods of prevention of progressing of a disease and the three-level system of medical examination [5].

In order to remove radionuclides from the body of a child, foods were included in the diet that promote the binding and removal of radioactive substances through the urinary system and the gastrointestinal tract. These products (bran, seaweed, apples, carrots, red rowan, jam, marmalade, marshmallow, marshmallows, jelly, etc.) contained a large amount of pectin and fiber [6].

In some cases, sorbents (activated carbon, smect, algisorb) and probiotics (lysozyme, hilak forte) were used. In addition, applied natural dietary supplement to food Mipro-Vit which connects and accelerates removal from an organism of radionuclides, salts of heavy metals, autotoxin [4].

To reduce the activity of free radical processes, preparations with antioxidant properties (AP) are used: vitamin E, succinic acid, xyphon, mipro-vit [1]. When conducting immunocorrective therapy, it is especially important to increase the activity of the phagocytic system and normalize the local immunity of the mucous membranes. [5].

Among not fermental AP companies the vitamin E differing in high antioxidant properties and a hypotoxicity is most widespread. Its clinical use at small acute oxidative damages at the person was effective when initial levels - tocopherol were low. A pronounced antioxidant effect of rutin (vitamin P), which prevented free-radical processes caused by asbestos dust, was found. Ionol (dibunol) is the most

studied synthetic phenolic AP, which forms stable, practically inactive radicals, has a high activity exceeding that of tocopherol by 3-6 times. [2].

To compensate for the leading mechanisms of development of pathological process and a decongestant, antioxidant, immunocorrecting coagulatory and sanogenetic effects used drugs from the group of chelators. In this regard, the pathogenetic validity of the use of **xydiphone** has been proved [3].

The literature data indicate the effectiveness of the spa treatment of children of the Chernobyl zone. A set of models and algorithms for rationalizing tactics of treatment and rehabilitation activities in sanatorium conditions for children permanently residing in the Chernobyl wake zone has been developed, taking into account the dynamics and interrelation of the analyzed indicators included in the monitoring program [7].

CONCLUSIONS:

Clinical observation is carried out in accordance with the three-level clinical examination system developed at the Children's Scientific-Practical Center for Radiation Protection of the Ministry of Health of the Russian Federation, including a specific set of examination methods and diagnostic manipulations at each level: regional (first), regional (second), federal (third).

P.S. Thus, the revealed pathogenetic mechanisms of damage at constant action of small doses of radiation allowed to prove scientifically the special system of actions for treatment and rehabilitation of the patients with dental diseases living in the radiation polluted territories.

REFERENCES:

1. Kuznetsova M.Yu., Mitin N.E., Kozhemov S.I., Sevbitova M.A., Timoshina M.D., Simagina E.S. Etiological factors of acquired defects and deformations of maxillofacial area. *Indo American Journal of Pharmaceutical Sciences*. 2019; 6(3): 6414-6417.
2. Sevbitov A.V., Dorofeev A.E., Davidyants A.A., Ershov K.A., Timoshin A.V. Assessment of pain perception of elderly patients with different levels of dentophobia during surgical dental appointment. *Asian Journal of Pharmaceutics*. 2018; 12(S3): 1012-1016.
3. Platonova V.V., Nevdakh A.S., Kuznetsova M.Yu., Sevbitov A.V., Mironov S.N., Borisov V.V., Danshina S.D. Frequency of traumatic complications of orthodontic treatment depending on type of braces which are used. *Indo American Journal of Pharmaceutical Sciences*. 2018; 5(1): 141-143.
4. Timoshin A.V., Sevbitov A.V., Ergesheva E.V., Boichuk A.V., Sevbitova M.A. Experience of treatment of aphthous lesions of oral mucosa by preparations on the basis of collagen and digestase. *Asian Journal of Pharmaceutics*. 2018; 12(S1): 284-287.
5. Sevbitov A.V., Mitin N.E., Kuznetsova M.Yu., Tikhonov V.E., Kamenskov P.E., Kuznetsov I.I. Determination of the psychoemotional status of the patients depending on the anomalies of teeth position and bite. *Indo American Journal of Pharmaceutical Sciences*. 2019; 6(3): 5710-5713.
6. Timoshin A.V., Dorofeev A.E., Davidyants A.A., Ershov K.A., Pustokhina I.G., Danshina S.D. Features of the dental status of patients taking narcotic smoking mixtures. *Indo American Journal of Pharmaceutical Sciences*. 2018; 5(9): 9114-9117.
7. Voloshina I.M., Borisov V.V., Sevbitov A.V., Davidyants A.A., Mironov S.N., Kuznetsova M.Yu., Ergesheva E.V. Distinctive features of microcrystallization of mixed saliva in children with different levels of activity of carious process. *Asian Journal of Pharmaceutics*. 2018; 12(S3): 1017-1020.