ON MEDICAL WORKERS INTERNATIONAL SYSTEM OF EXAMINATION

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Research relevance: nowadays, when a specialist wants to work in the USA or other foreign country it is necessary to verify his/her medical diploma. This system of verification is inconvenient and requires additional time and financial expenses. Here we would like to introduce one of the possible ways to solve the problem.

Objectives: the objectives are to analyze and create a comfortable scheme of examinations filled with questions, clinical situations, and other exercises, which results can be accepted in most parts of the world.

Materials and methods: materials of American (USMLE) and Russian (Accreditation of Specialists) medical exams are used in this investigation. To receive a perfectly balanced clear system for participants from different countries it is necessary to take into account the experience of different countries.

Results: a friendly and comfortable system of international examination, we propose, may be accepted in most parts of the world. The project includes various questions according to the field of application, clinical situations and other exercises. Having analyzed materials and the whole scheme of the exam, we may create not only the system but also a bank of questions for each topic. The bank of questions can be automatically upgraded afterwards. We use English language, when doing this project, because it is the most popular means of communication in our planet. It means that all non-native speakers of English are in the similar conditions. So we combine all types of exams in one, i.e. checking and verifying the level of medical knowledge and English. To sum up, the system is very fair and non-discriminative for non-speakers.

Conclusion: this project has not only unique theoretical value, but also practical. It can be used in different spheres of medical education as well as language learning. All the participants of the exam will benefit. Students and young doctors can achieve a lot of different opportunities such as to study abroad, do clinical and scientific work according to their professional interests. The employee would have more well-qualified specialists to choose who, in their turn, give rise to new ideas.

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STUDY OF THE EMBRYOTOXICITY OF TITANIUM DIOXIDE NANOPARTICLES

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Research relevance: currently, research in the field of nanotechnology and assessment of its risk to human health and the environment are recognized as the highest priority worldwide. The study

of titanium dioxide (TiO2) reproductive toxicity — the effect of nanoparticles on generative function, the development of the fetus and offspring — is an indispensable part of the preclinical study of their safety. Today it is known that nanomaterials can have an embryotoxic effect, having a direct toxic effect on the fetus after penetrating the placental barrier or affecting the placenta or the maternal organism.

Objectives: identification of possible embryotoxic properties of nanodispersed titanium dioxide (TiO2) upon oral intake.

Materials and methods: 20 animals were selected and taken into the experiment. Embryonic toxicity studies were conducted on 10 female Wag / Rij white rats and 10 Wistar female rats weighing 170–210 g. All animals were kept in the same conditions of the vivarium on a standard balanced diet. For two estrous cycles vaginal smears were examined. The proestrus, estrus, diestrus and metaestrus stages were noted. In the evening the males were placed at the rate of 2 males per 3 females. Detection of spermatozoa in vaginal smears was considered the first day of pregnancy.

All rats were divided into an experimental group and a control group. Animals of the experimental group were orally administered the study drug daily from the 1st to the 19th day of pregnancy. Daily, the females of the experimental group of rats were weighed and the required dose of titanium dioxide (TiO2) was calculated from the obtained animal mass (100 mg of drug per 1 kg of animal mass). On the 20th day of pregnancy animals were euthanized and there followed a post-mortem examination.

Results: to determine the preimplantation mortality the difference between the number of corpus luteum and the number of implantation sites was found, and it was calculated that percentage of this number was the number of corpus luteum. To determine the postimplantation mortality the difference between the number of implantation sites and the number of live fetuses was calculated, and it was calculated that percentage of this number was the number of implantations. To calculate the total embryonic mortality the difference between the number of yellow bodies of pregnancy and the number of live fetuses was found and it was determined that percentage of this figure was the number of yellow bodies of pregnancy. At the time of the autopsy all the bodies in all groups were alive. The duration of pregnancy, the number of live fetuses, their body weight and size, the number of yellow bodies, implantation sites, with daily oral administration of nano-dispersed (TiO2) did not differ from the corresponding indicators in animals of the control group. The body weight of the pregnant rats themselves showed no strong abnormalities. At the opening of the females, it was found that all the bodies were developed according to the duration of pregnancy. The number of yellow bodies, implantation sites, the average number of embryos per female in the experimental groups, the average mass of the fetus did not differ from the control group. However, the main indicators — the preimplantation death of zygotes in the experimental groups, the total embryonic mortality were higher in the experimental group compared to the control group. Moreover, more significant changes were noted in the group of rats of the Wag / Rij line. The total preimplantation mortality in the Wag / Rij group increased by 7.47%, while in the Wistar group by 3.82%, fetal mortality by 6% and 4%, respectively. Anatomical examination of embryos revealed that hemorrhages and hematomas were found exclusively among embryos of the experimental groups. Titanium nanodioxide may have an embryotoxic effect.

Conclusion: daily oral administration of titanium dioxide nanoparticles to pregnant rats causes an increase in pre-implantation and total embryonic mortality rates. An assessment of the morphometric parameters of embryos did not reveal significant differences in this parameter in Wistar and Wag / Rij rats compared with the control groups of rats. Anatomical study of embryos revealed cases of multiple hemorrhages and hematomas in embryos of rats of both animals in case of daily oral intake of titanium dioxide nanoparticles to rats from the 1st to the 19th day of pregnancy.

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