

EVALUATION OF GROWTH AND DEVELOPMENT OF RAT PUPS, PRENATALLY EXPOSED TO XENOBIOTIC

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The presence of surfactants and their biodegradation products in different environmental compartments can invoke a negative effect on the biota. Studies show that biological action of non-ionic surfactants are characterized by numerous structural metabolic disorders, as well as possibility to condition remote consequences, such as acceleration of immune deficiency, mutagenesis, adverse reproductive effects.

The goal of the present study was to assess the impact of Laprol-604 on the development of rat pups prenatally exposed to this surfactant.

Laprol-604 was provided from Science and Production Joint Stock Company "Sintez PAV" (Shebekino, Russian). Laprol-604 was reported to be 96% pure by the supplier. For all the studies, Laprol-604 was diluted in deionized water and prepared fresh daily. One hundred pregnant Wistar rats (body weight, 210 ± 30 g at the beginning of the study) bred within a 4-h period in the afternoon and overnight. Those animals with spermatozoa in vaginal smear were considered to be at gestation day (GD) 0. They were randomly divided into four groups (25 animals in each group). Laprol-604 was administered to pregnant dams once daily by gavage at doses of 0.125; 1.25 and 12.5 mg/kg, respectively in the 1st; 2nd and 3rd group from GD 2 until GD 21. The 4th group (controls) consisted of 25 intact animals without Laprol-604 administration. All the procedures were performed according to Ukrainian and International guidelines for the use of animals in research.

Laprol-604 administration decreased statistically significant litter size in the 3rd group (5.48 ± 0.21), 2nd (7.07 ± 0.15) and 1st (8.20 ± 0.12) groups compared with controls (9.31 ± 0.23) ($p < 0.01$). Body weight of pups in the 12.5 mg/kg dosage in the 3rd group significantly stunted behind control pups. In addition, all of them were pallid, inactive, became moribund and died within the first 48 hours after birth. Approximately 50% of the pups born from mothers (2nd group) who were daily administered 1.25 mg/kg died during the first 10 days after birth. Other 50% of these animals survived and reached puberty. However, survived offspring showed delays in growth and opening of the eyes. The pups opened their eyes on the 14th postnatal day. Prenatal exposure of rats to Laprol-604 resulted in delayed release and erection of the pinna. Normal epithelial detachment of the pinna occurred in controls 48-72 hours after birth followed by gradual attainment of upright pinna the next day. Prenatal Laprol exposure of pups showed retarded release of the epithelial edge and 48-hours delay in unfolding and erection of the pinna. By postnatal day 8, sculpting

of the external ear was noticeably poorer in animals of the 2nd group compared to the 1st group or controls. In addition, other distinguishing features were present such as accelerated formation of the oral vestibule, malformation of the vibrissae, and impending eruption of the lower incisors. On the other hand, the lower administered dose of Laprol-604 led to a blunted response relatively similar in appearance to controls. Subsequent observation revealed that in rat pups of the 2nd group the mean time of the external auditory canal opening was delayed by 72 hours

This finding indicated that Laprol-604 could retard some developmental signs: reduced litter size, resulted in low birth weight of progeny and deceleration of body weight gain in rat pups. In rodents, the present findings demonstrate that Laprol-604 administration markedly retard external ear canal opening, the time of eyelid opening and incisor eruption. The study showed dosage dependency of Laprol-604 on developmental toxicity effect on progeny of female rats exposed to Laprol-604 during gestational period.

ОБГРУНТУВАННЯ РАЦІОНУ ЛІКУВАЛЬНО-ПРОФІЛАКТИЧНОГО ХАРЧУВАННЯ ОСІБ, ЯКІ КОНТАКТУЮТЬ ІЗ СПОЛУКАМИ РЬ, В ТОМУ ЧИСЛІ ЙОГО НАНОЧАСТКАМИ

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Актуальність. Використання наночастинок (НЧ) свинцю у різних галузях народного господарства обумовлює потрапляння їх в об'єкти довкілля, що може становити потенційну небезпеку для працівників різних підприємств і населення в цілому. Вищевказане формує завдання щодо розробки ефективних заходів профілактики негативної дії даного токсиканта на організм людини. Одним із дієвих засобів захисту організму від впливу шкідливих чинників виробничого середовища є лікувально-профілактичне харчування, яке спрямоване на активацію неспецифічних та специфічних захисних механізмів.

Мета – наукове обґрунтування шляхів патогенетичної аліментарної профілактики негативного впливу наночастинок свинцю на організм.

Матеріали та методи. В експерименті на тваринах було вивчено вплив НЧ РЬ різного розміру (10, 30 нм) у порівнянні з іонною формою нітрату РЬ розміром часток 400 нм на показники білкового, жирового, вуглеводного обмінів, функціональний та морфологічний стан гепатобіліарної системи, загальний стан організму щурів лінії Вістар. Проведений аналіз детоксикаційних, гепатопротекторних, імуномодулюючих властивостей харчових продуктів.