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POSTER COMMUNICATION · PHARMACOLOGY & THERAPEUTICS

Implementation of experimental audiometry and vestibulometry in the preclinical research of medicinal products

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KEY MESSAGES

1. Preclinical experimental audiometry and vestibulometry methods were successfully implemented on laboratory animals to study drug effects.
2. Automated systems like CatWalk XT and Rota Rod improve sensitivity and reduce observer bias in vestibular function tests.
3. These methods enable rapid, non-invasive evaluation of balance and motor coordination, facilitating drug effect validation.

ABSTRACT

Introduction. Vestibular system disorders, manifested by vertigo and imbalance, are frequently underdiagnosed and pharmacotherapeutic options are limited. Sensorineural hearing loss (SNHL) is an important medical issue. Preclinical studies represent a fundamental step in developing innovative therapies to prevent drug-induced ototoxicity. In the drug research and development process, in vivo pharmacological studies on laboratory animals are necessary to obtain predictive data for humans.

Materials and methods. Since 2016, experimental audiometry methods have been developed and implemented on laboratory animals (rats). The research algorithm includes establishing the method to induce SNHL, acoustic otoemissions of TEOAE and Preyer reflex, and morphological examination of the inner ear. Positive opinion of the Institutional Ethics Committee of Research No.7 dated 21.10.2024.

Results. Within the national project "Optimization of preclinical research of medicinal products acting on the auditory and vestibular system" funded by NARD and conducted at the The National Institute for Health and Medical Research (NIHMR) of SUMPh "Nicolae Testemitanu" in 2024-25, audiometric research on laboratory animals (Wistar rats) was optimized by implementing acoustic otoemission recording methods TEOAE and DPOAE without the need for drug-induced sleep (Rat Restraint). For the first time, experimental vestibulometry methods were implemented (open field test, horizontal walking, forced motor activity test to maintain balance). Automated systems CatWalk XT, Rota Rod, Roto Meter increase sensitivity and reduce observer bias, adding useful quantitative parameters for validating vestibulotoxic and vestibuloprotective effects of drugs. These tests allow rapid, non-invasive evaluation of balance and motor coordination, with the possibility of correlation with neurophysiological and morphological data (NIHMR infrastructure).

Conclusion. At the Research Center in Health and Biomedicine of SUMPh "Nicolae Testemitanu," a theoretical and practical basis was developed for an interdisciplinary and systemic conceptual approach to preclinical studies on cochleo-vestibulopathies pharmacotherapy with potential for implementation in national and international research projects.

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POSTER



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