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# PROCEDURE OF PRACTICAL EXERCISE WITH STUDENTS ON THE THEME "PATHOGENIC EFFECT OF ACCELERATIONS ON THE ORGANISM"

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Translation of "K Metodike prakticheskogo zanyatiya so studentami po teme "patogennoye deystviye uskoreniy na organizm", Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No. 4 (July-August), 1978 pp 81-82



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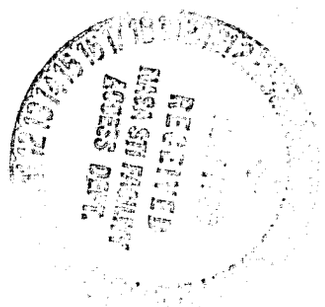

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16. Abstract

Effects of acceleration alone and coupled with administration of either aminazine (chlorpromazine--a sedative) or caffeine (a stimulant) on the development of kinetoses in mice are studied. The problem is presented as a method to teach students, explaining the effects of motion sickness and sedative or stimulant drugs, and to demonstrate the role of the nervous factor in the development of kinetosis.



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# PROCEDURE OF PRACTICAL EXERCISE WITH STUDENTS ON THE THEME "PATHOGENIC EFFECT OF ACCELERATIONS ON THE ORGANISM"

By

I. M. Tyrtyshnkov and L. M. Tarasenko*

In practical exercises with students on the theme "Pathogenic Effect of Accelerations on the Organism" as an illustration the experiment with reproduction in mice of kinetoses was cited [1]. According to published data, accelerations alter the functional state of the nervous system not only due to the disruption of afferent pulsation, but also as a consequence of the direct effect of inertial forces on the brain [2,3,4]. /81**

EFFECT OF FUNCTIONAL STATE OF CENTRAL NERVOUS SYSTEM ON DEVELOPMENT OF KINETOSES IN MICE

| Nature of effect | Time of effect, s | Clinical manifestations |
|---|---|---|
| Radial acceleration | 25 | Ataxia, dyspnea, exophthalmos |
| Radial acceleration | 60 | "Circus movements," dyspnea, hemorrhage in eyeballs, slower restoration of disrupted functions, death of individual animals |
| Caffeine + radial acceleration | 60 | "Circus movements," dyspnea, death of considerable number of experimental animals |
| Aminazine + radial acceleration | 60 | Depressed state, slight dyspnea |

In the proposed experiment in the beginning the mice were exposed to the action of radial acceleration for 25 s and the pronounced nature of the phenomena

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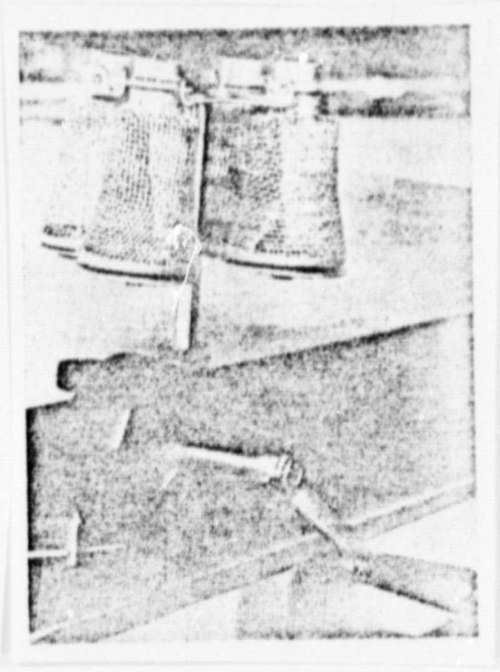
**Numbers in margin indicate pagination in original foreign text.



Instrument with Wire-Mesh Enclosures for Reproducing Kinetoses in Mice

characteristic for kinetoses are considered: "circus movements," ataxia, dyspnea, exophthalmos, as well as the rate of restoration of the disrupted functions. Then the duration of the effect of accelerations was increased. The students were convinced that the severity of the kinetoses increased here.

In order to study the role of the nervous factor in the mechanism of kinetosis development some mice were given a subcutaneous dose of a 0.25% solution of aminazine (1.0 ml per 100 g, others--10% solution of caffeine (1.0 ml per 100 g). At the end of 10-15 min, the mice simultaneously with the intact were exposed to the effect of radial acceleration for 60 s. The degree of disruption in the functions of the experimental mice was not the same (see table). On the background of caffeine pathological phenomena were pronounced especially clearly, often a fatal outcome occurred in the mice. A less pronounced degree of disruption in the functions and their earlier restoration were observed in animals with preliminary administration of aminazine. The experiments with preliminary administration of substances that /82
alter the functional state of the central nervous system convinced the students of the important role of the nervous factor in the mechanism of development of kinetoses.

To set up the experiment it is expedient to use wire-mesh enclosures (see figure) instead of cellophane bags with ties. This excludes the effect of cessation of air access and permits observation of their condition even before removal of the animals from the enclosures.

Calculation of the magnitude of the employed acceleration was made according to the formula suggested by P. D. Gorizontov and N. N. Sirotinin [3]: $a=R.(P.n)^2$, where a--acceleration, R--radius of rotation (in m); P--coefficient equal to

3.14; n--number of revolutions per second.

We consider it possible to recommend this demonstrative experiment with the use of mesh enclosures for mice for the practical exercises with students.

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