Title	Carcinogenicity of N-alkyl-N-(1-hydroperoxyalkyl) nitrosamines after intravenous injections in F344 rats
Sub Title	
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Publisher	共立薬科大学
Publication year	1986
Jtitle	共立薬科大学研究年報 (The annual report of the Kyoritsu College of Pharmacy). No.31 (1986.) ,p.72- 72
JaLC DOI	
Abstract	
Notes	抄録
Genre	Technical Report
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN00062898-00000031-0072

Carcinogenicity of *N*-alkyl-*N*-(1-hydroperoxyalkyl)nitrosamines after intravenous injections in F344 rats*

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As model compounds of α-hydroxy *N*-nitrosamines, four α-hydroperoxy *N*-nitrosamines were tested for their carcinogenic potential in F 344 rats by i.v. injections. Correlation between chemical structure and carcinogenic potencies with respect to target organs was examined. Compounds used in this study were *N*-methyl-*N*-(hydroperoxymethyl)-nitrosamine (MHPMN), *N*-ethyl-*N*-(1-hydroperoxyethyl)nitrosamine (EHPEN), *N*-propyl-*N*-(1-hydroperoxypropyl)nitrosamine (PHPPN) and *N*-butyl-*N*-(1-hydroperoxybutyl)nitrosamine (BHPBN). All chemicals were dissolved in distilled water and rats received 10×1 weekly i.v. injections of these chemicals (10×1 weekly injection of 5 mg/kg of MHPMN or equimolar amounts of other chemicals). Lung tumors were detected in all groups of both sexes and the incidences were 100% in each group. Thyroid tumors were also observed with relatively high incidences in treated groups except BHPBN. In the control group, tumors were observed mainly in the testis or uterus, and only two lung tumors and one thyroid tumor were observed in females. Histologically, all lung tumors in the MHPMN group were adenocarcinomas, squamous cell carcinomas or a mixture of both types. In the EHPEN, PHPPN and BHPBN groups, especially in females, incidences of carcinomas decreased as the length of the alkyl chain of the compounds, and most of lung tumors in females of the PHPPN and BHPBN groups were adenomas. Many of the thyroid tumors observed in the treated groups were follicular adenomas/carcinomas, whereas C-cell adenomas were the most common type of spontaneous thyroid tumors in this strain of rats. These target organs were similar to those of α-acetoxy *N*-nitrosamines reported previously. The results indicate that the carcinogenic activities of these chemicals depend on the length of the alkyl chain and that organ specificity of these chemicals may differ from those of their mother compounds.

* 本報告は *Carcinogenesis*, 7, 1313—1316 (1986) に発表
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