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论著

氟虫腈及其砜化物在兔体内的毒物代谢动力学

胡国新[1*]，陈晓宇[2]，周红宇[1]，邱相君[3]，陈冰冰[1]，卢中秋[2]

（温州医学院 1. 药理学教研室; 2. 附属第一医院急诊室, 浙江 温州 325027; 3. 河南科技大学医学院药理学教研室, 河南 洛阳 471003）

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摘要 目的 建立兔血浆中氟虫腈及其砜化物的高效液相色谱（HPLC）检测法，并研究其在兔体内的毒物代谢动力学，为氟虫腈中毒的临床诊断与治疗提供依据。方法 氟虫腈3 mg·kg^{-1}兔耳缘静脉注射后不同时间取血，采用高效液相色谱法检测血浆中氟虫腈及其砜化物的浓度，计算毒动学参数。结果 氟虫腈的毒动学参数：k_{10}为（2.08±0.83）h^{-1}，k_{12}为(0.34±0.07)h^{-1}，k_{21}为(0.27±0.05) h^{-1}，c_{max}为(3.48±0.52)mg·L^{-1}；$t_{1/2\alpha}$为(0.31 ±0.11) h；$t_{1/2\beta}$为(3.25±0.59) h；AUC为(4.96±1.22)mg·h·L^{-1}；Cl为(1.49±0.44) L·h^{-1}；V_1为(0.67±0.15)L·kg^{-1}；V为(2.62±0.65)L·kg^{-1}；砜化物的毒动学参数：c_{max}为（1.10 ±0.10）mg·L^{-1}；t_{max}为（6.08±1.94）h；$t_{1/2ke}$为（81.3±4.8）h；AUC为（136±16）mg·h·L^{-1}；Cl为（0.05±0.005）L·h^{-1}；V_d为（2.32±0.11）L·kg^{-1}。结论 氟虫腈静脉给药的毒物代谢动力学符合二室模型；其砜化物的毒物代谢动力学符合一室模型。氟虫腈砜化物的半衰期明显长于氟虫腈。

关键词 氟虫腈 氟虫腈砜化物 色谱法, 高压液相 毒代动力学

分类号 R979.8

Toxicokinetics of fipronil and fipronil sulfone in rabbits

HU Guo-Xin[1*], CHEN Xiao-Yu[2], ZHOU Hong-Yu[1], QIU Xiang-Jun[3],CHEN Bing-Bing[1], LU Zhong-Qiu[2]

（1. Department of Pharmacology; 2. Department of Emergency, the First Affiliated Hospital of Wenzhou Medical college, Wenzhou 325027 China； 3. Department of Pharmacology, Medical College, Henan University of Science and Technology, Luoyang 471003, China）

Abstract

AIM To study the toxicokinetics of fipronil and fipronil sulfone in rabbits and offer evidence for clinical diagnosis and treatment of fiproni intoxication. **METHODS** With diazepam as the internal standard, fipronil and fipronil sulfone were detected by UV detector at 276 nm with the Hypersil-ODS C18 column and acetonitrile-methanol-water（26∶24∶50，*V/V/V*）as the mobile phase at a flow rate of 1.0 mL·min^{-1}. Six male rabbits were involved in the study and injected with fipronil 3 mg·kg^{-1}. The plasma fipronil and fipronil sulfone concentrations were determined by HPLC and calculated by 3P87 pharmacokinetics program. **RESULTS** After intravenous injection of a single dose of 3 mg·kg^{-1} fipronil to rabbits, the toxicokinetical parameters of fipronil were as follows: k_{10}, （2.08±0.83）h^{-1}; k_{12}, （0.34±0.07）h^{-1}, k_{21}, （0.27±0.05）h^{-1}, c_{max}, （3.48±0.52）mg·L^{-1}, $t_{1/2\alpha}$, (0.31±0.11） h, $t_{1/2\beta}$, （3.25±0.59）h, AUC, （4.96±1.22）mg·h·L^{-1}, Cl, （1.49±0.44）L·h^{-1}, V_1, （0.67±0.15）L·kg^{-1}, V, （2.62±0.65）L·kg^{-1}. The toxicokinetical parameters of fipronil sulfone were as follows: c_{max}, （1.10±0.10）mg·L^{-1}; t_{max}, (6.08±1.94) h; $t_{1/2ke}$, （81.3±4.8）h; AUC,（136±16）mg·h·L^{-1}; Cl, (0.05±0.005）L·h^{-1}, V_d,（2.32 ±0.11）L·kg^{-1}. **CONCLUSION** Following intravenous injection administration, the kinetics of fipronil is fitted to two-compartment model and fipronil sulfone is fitted to one-compartment model. The half life of fipronil sulfone is longer than that of fipronil.

Key words fipronil fipronil sulfone chromatography high pressure liquid toxicokinetics

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通讯作者　胡国新 wzhhgx@yahoo.com.cn