论文

呋喃苯胺酸在人体内的药动—药效学研究

朱家璧

南京药学院药剂学教研室

摘要：

本文研究了利尿药呋喃苯胺酸(速尿) 在人体内的药动—药效学。4名健康受试者分别口服了5,10,20及40 mg剂量的呋喃苯胺酸,测定了各时间的尿药数据,利尿量以及钠与钾离子排泄的增量。实验数据用电子计算机作了非线性最小二乘法模型嵌合处理,表明该药在体内符合双室开放模型。3 h内的总利尿量、总$Na^+ + K^+$的排泄增量与给药剂量的对数之间呈现良好的线性关系。给药后各时间的累积尿药量与累积药效之间符合Hill方程式。还推出了该药的排泄速度与利尿速度之间的一个关系式,与实验数据十分吻合。

关键词： 呋喃苯胺酸　药动—药效学　Hill方程式

STUDIES ON PHARMACOKINETICS AND PHARMACODYNAMICS OF FUROSEMIDE IN MAN

ZHU Jia-Bi

Abstract:

The pharmacokinetics and pharmacodynamics of furosemide were studied. Four healthy male volunteers between ages of 30 to 45 years were selected for the studies. Each subject received 5,10,20 and 40 mg of furosemide by oral adminitration. The urinary excretion data were analyzed by PDP-11 computer with a nonlinear least square model-fitting program designed by the author. Disposition of the drug in man can be described by two compartment open model. The pharmacokinetic parameters were as follows: $k_a = 2.5115$ h^{-1}, $k_{12} = 0.6441$ h^{-1}, $k_{21} = 0.7096$ h^{-1}, $k_{el} = 1.6018$ h^{-1}, $t = 0.2053$ h. Total increments of urine volume and urinary $Na^+ + K^+$ in 3 h after the drug administrations Were linearly related with the logarithm of corresponding doses. Quantitative relationship of pharmacokinetics and pharmacodynamics of furosemide can be characterized by Hill equation. Another equation relating the drug excretion rates and diuretic actions was inducted and by this equation the clockwise hysteresis of furosemide action can be simulated.

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