

大量投与時におけるフェンタニールおよび その代謝物の尿中排泄

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Urinary Excretion of Fentanyl and its Metabolites at High Dose Infusion

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ABSTRACT: We examined the urinary excretion of fentanyl and its four metabolites in surgical patients at high dose fentanyl anesthesia. Fentanyl, despropionyl-fentanyl (Nor-FT), p-hydroxy-fentanyl (p-OH-FT), (ω -1)-hydroxy-fentanyl (FT-(ω -1)-OH) and despropionyl-(ω -1)-hydroxy-fentanyl (Nor-(ω -1)-OH) were determined quantitatively in the urine by gas chromatography-mass spectrometry using each deuterated compound as an internal standard. Excretion of fentanyl, Nor-FT, p-OH-FT, FT-(ω -1)-OH and Nor-(ω -1)-OH during 24 hrs after continuous infusion of fentanyl (2.1 to 3.0 mg/body) accounted for 0.65 to 3.63, 8.24 to 25.18, 2.89 to 5.61, 0.00 to 0.05 and 0.04 to 0.53 as the percentage of the dose, respectively.

In comparison with the urinary excretion after one shot injection of fentanyl (0.5 mg/body), the excretion of main metabolite, Nor-FT at high dose infusion was decreased significantly ($p < 0.05$), and the rate of elimination of fentanyl which was calculated by the sigma-minus plot of the excretion of unchanged fentanyl, was slower than that of the low dose bolus injection.

It is suggested that these differences of the metabolic rate are mainly due the difference of physiological conditions of the patients.

抄録 大量投与時のフェンタニールの代謝・排泄について、フェンタニール及びその4種の代謝物の尿中排泄より検討した。持続注入開始後24時間尿中に、未変化体は投与量の1~4%、主代謝物である脱フェネチル体は8~25%、さらにフェンタニールのP位の水酸化体は3~6%が排泄され、他の2種の代謝物の排泄は1%未満であった。排泄量に個人差が認め

られるものの、少量1回静注時に比べて主代謝物の排泄は有意に少なく、また未変化体の排泄速度より求めたフェンタニールの消失も遅く、フェンタニールの代謝・排泄は生理的状态の影響を強く受けることが示唆された。

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