

论著

## 四逆散冻干粉改善睡眠作用的药效物质基础

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**摘要** 目的 探讨四逆散改善睡眠作用的药效物质基础, 为阐明其改善睡眠的作用机制提供依据。方法 Wistar大鼠随机分为正常对照、四逆散冻干粉 $12\text{ g}\cdot\text{kg}^{-1}$ 、芍药苷 $87\text{ mg}\cdot\text{kg}^{-1}$ 、甘草次酸 $39\text{ mg}\cdot\text{kg}^{-1}$ 、昔奈福林 $38\text{ mg}\cdot\text{kg}^{-1}$ 、柴胡皂苷C  $42\text{ mg}\cdot\text{kg}^{-1}$ 、血清移行成分配伍(昔奈福林:芍药苷:柴胡皂苷C:甘草次酸=8.5:1:1.5:6.5) $206\text{ mg}\cdot\text{kg}^{-1}$ 组, 给药组ig给药, 每天1次, 连续7 d, 于末次给药后5 h制备血清或抽取脑脊液, 用HPLC测定血清和脑脊液中四逆散移行成分; 或者连续ig给药7 d后, ip给予戊巴比妥钠 $50\text{ mg}\cdot\text{kg}^{-1}$ , 用翻正反射法测定小鼠睡眠时间。结果 ① 四逆散冻干粉连续给药7 d后血清样品中有14种移行成分, 经来源认定研究认为, 其中2号成分为昔奈福林, 4号成分为芍药苷, 12号成分为柴胡皂苷C, 14号成分为甘草次酸。② 四逆散冻干粉、芍药苷、甘草次酸、昔奈福林和柴胡皂苷C均可以使脑脊液中内源性物质峰面积增加, 其中四逆散冻干粉组是正常脑脊液峰面积的12.5倍; 血清移行成分配伍组脑脊液中内源性物质峰面积高于四逆散冻干粉组, 是四逆散冻干粉组的3.2倍。③ 昔奈福林、芍药苷、柴胡皂苷C和甘草次酸单用对戊巴比妥钠所致小鼠睡眠时间无明显影响, 四逆散冻干粉和血清移行成分配伍均延长小鼠睡眠时间( $P<0.01$ ), 且血清移行成分配伍组优于四逆散冻干粉组( $P<0.01$ )。结论 芍药苷、甘草次酸、昔奈福林和柴胡皂苷C是四逆散冻干粉给药后血清主要移行成分, 可能是四逆散改善睡眠作用的物质基础。

**关键词** [四逆散](#) [血清](#) [脑脊液](#) [睡眠](#) [有效成分](#)

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## Pharmacodynamic material basis of *Sini* powder for improving sleep

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### Abstract

**OBJECTIVE** To explore effective constituents in *Sini* powder (SP) that are sedative-hypnotic.

**METHODS** Wistar rats were randomly divided into normal control, freeze-dried SP  $12\text{ g}\cdot\text{kg}^{-1}$ , paeoniflorin  $87\text{ mg}\cdot\text{kg}^{-1}$ , glycyrrhetic acid  $39\text{ mg}\cdot\text{kg}^{-1}$ , synephrine  $38\text{ mg}\cdot\text{kg}^{-1}$ , saikosaponin C  $42\text{ mg}\cdot\text{kg}^{-1}$  and prescription of SP serum transitional ingredients (PSTI)

(synephrine:paeoniflorin:saikosaponin C:glycyrrhetic acid=8.5:1:1.5:6.5)  $206\text{ mg}\cdot\text{kg}^{-1}$  groups. The rats were ig given the corresponding drug once a day for seven consecutive days. The serum was prepared or cerebrospinal fluid was extracted 5 h after the last drug administration. Transitional ingredients of SP in blood and cerebrospinal fluid were analyzed by using HPLC method. In addition, the mice were ig given the corresponding drug once a day for seven days, and the sleep time induced by pentobarbital sodium was measured using righting reflex test. **RESULTS** ① After the rats were ig given

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SP for seven days, there were 14 kinds of transitional ingredients in the serum. The 2nd ingredient was synephrine, the 4th one was paeoniflorin, the 12th one was saikosaponin C and the 14th one was glycyrrhetic acid. ② SP, paeoniflorin, glycyrrhetic acid, synephrine and saikosaponin C could make the peak area of the endogenous substance in cerebrospinal fluid larger than that in normal cerebrospinal fluid. SP group was 12.5 times the peak area of normal group. In addition, the peak area of the endogenous substance in cerebrospinal fluid of PSTI group was 3.2 times that of SP group. ③