

论著

应用基于 $[^1\text{H}]$ NMR的代谢组学评价逍遥散的抗抑郁有效组分

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摘要 目的 以基于 $[^1\text{H}]$ 核磁共振 (NMR) 的代谢组学技术对慢性温和不可预知应激模型 (CUMS) 及逍遥散5个不同极性组分干预后的大鼠血浆进行代谢组学研究, 分析干预后大鼠血浆中小分子代谢物的变化以确定逍遥散抗抑郁作用的有效组分。方法 42只SD成年雄性健康大鼠, 分别ig给予石油醚萃取组分 (XY-A)、30%乙醇提取组分 (XY-B)、60%乙醇提取组分 (XY-C)、95%乙醇提取组分 (XY-D) 和药渣水提组分 (XY-E), 每天1次, 连续21 d, 每天ig给药30 min后用夹尾等刺激建立慢性温和不可预知应激模型, 每日1种, 持续21 d。造模21 d后于大鼠麻醉后于股动脉取血, 用NMR波谱仪检测小分子代谢物代谢轮廓, 对所得到的图进行分段积分并归一化, 然后用SIMCA-P软件进行分析。结果 正常对照组与模型组沿第一主成分能够明显分开, 与其它组分相比, XY-A组与模型组能够明显分开, 且离正常对照组最近。与正常对照组相比, 模型组亮氨酸/异亮氨酸、缬氨酸和3-羟基丁酸等含量明显下降; 丙氨酸、胆碱、糖类明显上升。与模型组相比, XY-A组亮氨酸、缬氨酸和3-羟基丁酸等有不同程度的回调。结合载荷图, 发现10种引起正常对照组与模型组分开的差异代谢物。与模型组相比, 这些代谢物在XY-A组大部分有不同程度的回调。结论 经过基于 ^1H NMR的代谢组学技术研究表明, 石油醚组分是逍遥散起抗抑郁作用的有效组分。

关键词 [核磁共振](#) [代谢组学](#) [逍遥散](#) [抗抑郁药](#)

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Antidepressant like active fraction of Xiaoyaosan by metabonomics based $[^1\text{H}]$ NMR spectroscopy

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Abstract

OBJECTIVE To identify the active fraction of Xiaoyaosan in producing antidepressant effect by applying $[^1\text{H}]$ NMR spectroscopy based metabonomic approach. **METHODS** Forty-two SD rats were ig given petroleum ether fraction (XY-A), 30% ethanol fraction (XY-B), 60% ethanol fraction (XY-C), 95% ethanol fraction (XY-D) or water fraction (XY-E), once daily, for 21 d. At 30 min after every administration, rats were simulated by kinds of factors, for 21 d, to set up chronic unpredictable mild stress model. Rats were anesthetized and blood samples were collected from the femoral artery after 21 d. The small molecular metabolic profiles were investigated using $[^1\text{H}]$ nuclear magnetic resonance spectroscopy (NMR). $[^1\text{H}]$ NMR spectra were integrated in segments of 0.01, normalized and then analyzed using SIMCA-P software. **RESULTS** The metabonomic results indicated that a clear separation of the model group and control group, while XY-A group was much closer to the control group than other fractions in the score plot. Compared with control group, leucine/isoleucine, valine, β -HB decreased, alanine, choline, glucose increased in model group. Compared with model group, XY-A regulated the leucine/isoleucine, valine and β -HB. Ten endogenous metabolites contributing to the separation of the model group and control group were detected, while XY-A group regulated the most perturbed metabolites showing a tendency of recovering to control group more or less. **CONCLUSION** Petroleum ether fraction is the most effective fraction for antidepressant.

Key words [nuclear magnetic resonance](#) [metabonomics](#) [Xiaoyao powders](#) [antidepressive agents](#)

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