



白香丹胶囊对PMS大鼠皮层神经元细胞相对活力及GABA_AR介导氯离子通道的影响

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中文摘要:目的: 探讨白香丹胶囊(BXD)治疗经前期综合征(premenstrual syndrome, PMS)肝气逆证大鼠的中枢作用机制。方法: 筛选合适大鼠, 随机分为正常对照组、BXD给药组, 采用旷场实验进行大鼠行为学评价, 采用MTT法和全细胞膜片钳技术测定大鼠含药血清对离体皮层神经元细胞相对活力和γ-氨基丁酸受体(GABA_AR)介导氯离子通道的影响。结果: 旷场实验中, 与正常模型组相比, BXD给药组大鼠水平得分、垂直得分及旷场实验总分均明显减少($P < 0.05$); MTT实验中, 与正常模型组相比, 给药24、48 h后, BXD给药组神经元MTT值显著增加($P < 0.05$); 电生理实验中, 离体大鼠皮层神经元细胞经正常模型组大鼠血清和BXD给药组大鼠血清处理后, 曲线拟合参数 EC_{50} 和 n_H 分别为 $(63.5 \pm 8.2) \mu\text{mol} \cdot \text{L}^{-1}$ 、 1.04 ± 0.10 和 $(29.0 \pm 4.4) \mu\text{mol} \cdot \text{L}^{-1}$ 、 1.07 ± 0.16 ; 其中 EC_{50} (正常) $> EC_{50}$ (BXD), 差异有统计学意义($P < 0.01$), 而 n_H (BXD) $> n_H$ (正常组), 差异无统计学意义。结论: BXD可明显减少大鼠旷场实验得分, 可有效提高大鼠皮层神经元细胞活力和GABA_AR活性; paeonimetabolins I、paeonol可能就是BXD治疗PMS有效物质成分, 而paeonol很可能通过作用于GABA_AR这一靶点来发挥药效作用。

中文关键词: 经前期综合征 肝气逆证 白香丹胶囊 芍药苷 香附酮 丹皮酚 γ-氨基丁酸 γ-氨基丁酸受体 MTT 膜片钳

Treatment of premenstrual syndrome with Chinese medicine formula, Baixiangdan capsule: implications for neuron viability and GABA_A receptor modulation in rat cortex

Abstract: Objective: To explore the effects of Baixiangdan capsule (BXD), a Chinese medicinal formula, on the premenstrual syndrome (PMS) rats with Liver-qi invasion and the possible underlying micro-mechanisms. Method: Wistar rats were randomly assigned to two groups, normal group and BXD group. After evaluated by macro-behavior observation and open-field test, MTT assay and the whole-cell patch clamp recording were performed respectively to evaluate the effects of serum from BXD capsule-treated rats on the viability and GABA_AR-induced currents of cortical neurons *in vitro*. Result: In the open-field test, the crossing score, rearing score and total score of BXD rats decreased significantly ($P < 0.05$), compared by the normal rats. Compared with cells exposed to serum of normal rats, the viability values of those incubated with serum of BXD group for 24 h and 48 h significantly increased ($P < 0.05$), measured by MTT assay. The results of whole-cell patch clamp recording showed that concentration-response relationship curves revealed an EC_{50} value of $(29.0 \pm 4.4) \mu\text{mol} \cdot \text{L}^{-1}$ and a Hill coefficient of 1.07 for normal-exposed cultures, $(63.5 \pm 8.2) \mu\text{mol} \cdot \text{L}^{-1}$, 1.04 for BXD-exposed cultures after incubation for 24 h. Furthermore, the difference in EC_{50} values was statistically significant ($P < 0.01$), that in the Hill coefficient was not obvious. Conclusion: BXD capsule could significantly decrease crossing score and total score of open-field test and effectively enhance the neuron viability and GABA_A receptor activity in rat cortex. Paeonimetabolins I and paeonol may play a significant role in treating PMS model rats with Liver-qi invasion by BXD capsule, and paeonol may target at GABA_A receptor, especially.

keywords: premenstrual syndrome liver-qi invasion Baixiangdan capsule paeoniflorin cyperone paeonol GABA GABA_A receptor MTT patch clamp

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