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论文

毒死蜱对大鼠脑组织RAGE介导Gq-PKC信号转导途径影响

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摘要：

目的 探讨48%毒死蜱(CPF)对大鼠胆碱酯酶活力及晚期糖基化终末产物受体(RAGE)介导的Gq-蛋白激酶C(PKC)信号转导途径影响。方法 将大鼠随机分为CPF低(1/40LD_{50})、中(1/20LD_{50})、高(1/10LD_{50})3个剂量组和生理盐水对照组,经口染毒28 d后,用三氯化铁比色法检测大鼠全血胆碱酯酶活力;荧光免疫组化法检测脑组织RAGE、PKC的表达,蛋白质印迹法(western blot)检测脑组织中Gq蛋白的表达。结果 全血胆碱酯酶活力随染毒剂量的增加而降低,对照组和CPF低、中、高剂量组三氯化铁比色法测定值分别为(33.75±5.03)、(29.70±4.01)、(10.40±1.95)、(5.25±0.05);RAGE、Gq蛋白、PKC的表达均随染毒剂量的增加而增高,对照组和CPF低、中、高剂量组RAGE免疫反应平均光密度值分别为(0.32±0.01)、(2.01±0.09)、(5.03±0.05)、(8.02±0.04),Gq蛋白的相对含量分别为(0.84±0.01)、(0.90±0.01)、(1.10±0.02)、(1.59±0.01),PKC免疫反应平均光密度值分别为(0.12±0.01)、(2.01±0.03)、(3.52±0.02)、(5.01±0.08)。结论 CPF主要通过抑制胆碱脂酶的活力对机体造成损伤,RAGE、Gq蛋白、PKC的高表达可能参与了CPF中毒神经系统病理性信号转导。

关键词： 48%毒死蜱(CPF) 胆碱酯酶 晚期糖基化终末产物受体(RAGE) 信号转导

Effect of chlorpyrifos on RAGE-Gq-PKC signal transduction of brain tissue in rats

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Abstract:

Objective To investigate the effect of 48% chlorpyrifos on cholinesterase activity and signal transduction pathway in rats.Methods Thirty-two rats were randomly divided into low-dose(1/40 median lathal dose [LD_{50}]),moderate-dose(1/20 LD_{50}),high-dose(1/10 LD_{50})groups,and saline control group.The rats were treated by oral gavage for 28 days.The activity of whole blood cholinesterase was detected with ferric chloride colorimetric method; the expression of the receptor of advanced glycation end-products(RAGE)and protein kinase C(PKC)in brain tissue were detected with the immunohistochemistry;the expression of Gq protein in brain tissue were detected with western blot.Results The activity of whole blood cholinesterase decreased with the increase of exposure,with the value of 33.75 ±5.03,29.70±4.01,10.40±1.95,and 5.25±0.05 for control group,low-,moderate-,and high-dose groups.The expressions of RAGE,Gq protein,and PKC increased with the increase of exposure,with the RAGE expression of 0.32± 0.01,2.01±0.09,5.03±0.05,8.02±0.04,Gq protein expression of 0.84±0.01,0.90±0.01,1.10±0.02,1.59± 0.01,and PKC expression of 0.12±0.01,2.01±0.03,3.52±0.02,5.01±0.08 for control group,low-,moderate-,and high-dose group,respectively.Conclusion Chlorpyrifos shows toxicity to rats by inhibiting the activity of cholinesterase.The high expression of RAGE,Gq protein and PKC might be involved nervous system pathological signal transduction in chlorpyrifos poisoning.

Keywords: 48%chlorpyrifos cholinesterase RAGE signal transduction

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