

论著

砷对大鼠胚胎神经系统发育和HSP70mRNA 表达的影响

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摘要 应用显微解剖、原位杂交组织化学、扫描电镜等技术深入研究了三氧化二砷对大鼠胚胎的发育毒性和神经毒性及HSP70mRNA 表达与胚胎神经系统发育的关系。结果表明反映胚胎神经系统发育的头长,神经管未闭、体位异常和脑部形态异常发生率均与染砷剂量和作用时间呈正比关系($P < 0.05$)。扫描电镜观察发现大鼠胚胎脑部表皮细胞的微绒毛数量减少,回缩变短,细胞膜表面出现许多小的空洞性病理改变。原位杂交结果表明砷能激发大鼠胚胎产生应激反应,10mg/kg 砷诱导的神经管未闭发生率(35.17%)和HSP70mRNA原位表达强度均明显高于4mg/kg 砷的作用,证明热休克反应具有双重作用,揭示了砷的发育毒性与其剂量和作用时间是否大于细胞内HSP70 合成量的自我调控水平有关,同时亦与损害时间发生于胚胎器官形成期的那一时段密切相关。

关键词 [砷](#) [热休克蛋白70mRNA](#) [原位杂交](#) [胚胎](#) [神经毒性](#)

EFFECTS OF ARSNIC ON DEVELOPING NERVOUS SYSTEM AND HSP70mRNA EXPRESSION DURING RAT NEURULATION PERIOD

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Abstract In situ hybridization histochemistry (ISHH), scanning electron microscope (SEM) and microdissection were used to determine neurotoxicity and developmental toxicity and expression of HSP70mRNA during rat neurulation period in vivo. Following an increase in dose or active time of arsenic all indexes correlated with embryonic nervous system development and morphological differentiation were changed, which had an apparent dose-effect relationship ($P < 0.05$). Atrophied and decreased microvilli, and cavernous damages of epidermic cells on embryonic brain were seen under SEM. The result of ISHH showed that arsenic could induce stress response of rat embryos. The incidence of open neural tube (35.7%) and gene overexpression of HSP70mRNA induced by 10mg/kg arsenic were higher than that action of 4mg/kg arsenic. It was the reason that HSP70 could have double action. Developmental and neural toxicity of different dose of arsenic was related to level of self-control and synthesis of HSP70 in embryonic cells and which specific phase of embryonic developmental processes.

Keywords [arsenic](#) [HSP70mRNA](#) [in situ hybridization](#) [embryo](#) [neurotoxicity](#)

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