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Identification of factors mediating the effect of the brain dopaminergic system on the expression of cytochrome P450 in the liver

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Abstract:
Our earlier study showed that damage to brain dopaminergic pathways causes decreases in CYP2B, CYP2C11 and CYP3A, as well as increases in CYP1A protein levels and activities in the liver. The aim of the present study was to investigate the influence of lesions of brain dopaminergic pathways on hormones and cytokines that are thought to mediate the effect of the dopaminergic system on liver CYP expression.
At 48 h or 7 days after lesion of the tuberoinfundibular pathway, growth hormone level was significantly decreased, while the concentration of triiodothyronine was considerably increased. Fourteen days after lesion of the mesolimbic pathway, triiodothyronine level was significantly elevated, while corticosterone concentration was visibly reduced. The plasma levels of thyroxine, testosterone, interleukin-2, and interleukin-6 were not changed after lesion of the tuberoinfundibular or the mesolimbic pathways.
The present study suggests that liver CYP is regulated by the dopaminergic tuberoinfundibular pathway *via* growth hormone and triiodothyronine, while the mesolimbic pathway influences this enzyme *via* corticosterone and triiodothyronine. Cytokines are not involved in the observed down-regulation of CYP isoforms after lesion of either dopaminergic pathway.

Key words:
brain dopaminergic pathways, selective lesions, plasma hormone and cytokine levels