

Effects of growth hormone in the hippocampus and cortex of adult rodents

It is unknown whether different modes of administration of growth hormone (GH) would affect the brain and elicit different responses in previously known targets of GH. In our experiments, we have investigated the effects of GH in the brain of mice and both sexes of rats. In the mice, we have explored if locally produced GH in astrocytes could affect proliferation and GH related transcripts in the hippocampus. Our results show that local GH overexpression may have a relatively small direct effect within the brain. Instead, endocrine or local endogenous GH may exert its effects by activating local insulin like growth factor (IGF-I) in the brain or circulating IGF-I. For the female and male rats our hypothesis was that different types of GH administration, mimicking the sexually dimorphic endogenous GH-secretion, could influence the biological response in the brain. Therefore, we administered GH as two daily injections or continuous infusion. We examined the effect of GH in the hippocampus and parietal cortex. Our main findings show that neuron-haemoglobin and delta-aminolevulinate synthase 2 are robustly regulated by GH administration. Other categories of transcripts were also regulated by GH to a lesser degree but differently comparing hippocampus and cortex and in females and males. This may have consequences for how GH should optimally be administered after injuries.

ISBN 978-91-628-9959-2 (PRINT)
ISBN 978-91-628-9960-8 (PDF)

Printed by Ineko AB, Gothenburg

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