

Abstract

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Effect of prolactin on inositol uptake in mouse mammary gland explants.

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OBJECTIVE AND METHODS: Studies were carried out to assess the role of insulin (I), cortisol (H), and prolactin (P or PRL) in regulating myoinositol (inositol) uptake in the mammary gland. Using cultured mammary gland explants from pregnant mice (12-14 days into gestation), insulin and prolactin were found to stimulate inositol uptake, while cortisol impaired inositol uptake.

RESULTS: Optimal inositol uptake was observed when tissues were treated with all three lactogenic hormones (I, H, and PRL). Further studies were designed primarily to characterize the PRL stimulation of inositol transport. Inositol uptake in the mammary explants increased linearly for 4 h, both in IH treated tissues and those treated with IHP; distribution ratios of greater than 14 were achieved at 4 h, suggesting an active inositol transport mechanism. The PRL effect on inositol uptake is sodium-dependent, temperature-dependent, and ouabain sensitive. DIDS and furosemide did not impair inositol uptake or the PRL effect on inositol uptake. PRL stimulated inositol uptake employing PRL concentrations of 10-1000 ng/ml. The PRL effect was manifested at all PRL-treatment times of 12 h or longer, but not at earlier times.

CONCLUSION: PRL thus appears to be an important and essential hormone for the stimulation of inositol accumulation in milk during lactogenesis.

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