

FACTORS CONTRIBUTING TO THERAPEUTIC POTENTIAL OF ORAL GALACTOSE IN A RAT MODEL OF SPORADIC ALZHEIMER'S DISEASE

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Objectives:

Galactose demonstrates insulin-independent entry into the cell and intracellular metabolism to glucose suggesting possible therapeutic potential for brain insulin resistance and glucose hypometabolism in sporadic Alzheimer's disease (sAD). Our previously reported that chronic oral galactose administration prevents/improves cognitive deficit in streptozotocin-intracerebroventricularly (STZ-icv) treated rat model of sAD(1). We aimed to explore galactose levels in blood/cerebrospinal fluid (CSF) of healthy and STZ-icv rats following different galactose doses and routes of administration.

Materials:

Healthy Wistar rats were given galactose intraperitoneally (10 mg; 200 mg, ip) or orally (200 mg; 1000 mg, po). Another group was treated STZ-icv (3 mg/kg), and subjected to ip/po 200 mg galactose dose after 1 month and euthanized 15 min afterwards.

Methods:

Blood/CSF galactose was measured by ELISA, cognition by Passive avoidance test, and data analysed by Kruskal-Wallis ANOVA/Mann-Whitney U- test, $p < 0.05$.

Results:

Doses of 200 mg resulted in blood galactose increment regardless route of administration ($p < 0.05$) in healthy and STZ-icv rats. Increment in CSF was seen only in healthy rats after 1000 mg po (136%) and 200 mg ip (114%) dose ($p > 0.05$). 200 mg dose induced larger blood galactose increment following ip than po administration (220% vs 121%, $p < 0.05$), with CSF galactose increment detected only after ip administration, both seen in healthy rats. STZ-icv-induced cognitive deficits remained unaffected by single galactose dose.

Discussion:

Oral vs parenteral galactose elicits significantly milder rise in its blood/CSF levels.

Conclusion:

Lower blood/CSF galactose levels might account for cognitive improvement seen after chronic oral vs parenteral galactose treatment.

Supported by HRZZ-IP-2014-09-4639.

Topic:

neurobiology

References:

Salkovic-Petrisic M, Osmanovic-Barilar J, Knezovic A, Hoyer S, Mosetter K, Reutter W. Long-term oral galactose treatment prevents cognitive deficits in male Wistar rats treated intracerebroventricularly with streptozotocin. *Neuropharmacology*. 2014 ;77:68-80.

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Tipo presentazione: POSTER
Progetto giovani: NO