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O-MSC-01 - IMPAIRED NORADRENERGIC DESCENDING PAIN MODULATION IN A KAOLIN-INDUCED HYDROCEPHALUS RAT MODEL

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Resumen

Objectives: Pain transmission at the spinal cord is modulated by descending actions that arise from supraspinal areas which collectively form the endogenous pain control system. Two key areas involved in the endogenous pain control system have a circunventricular location, namely the periaqueductal grey (PAG) and the locus coeruleus (LC). We used an experimental model of hydrocephalus (rat injected in the cisterna magna with kaolin) to study descending modulation of pain, focusing on these two circumventricular regions.

Material and methods: In order to evaluate the effects of kaolin injection, we measured the degree of ventricular dilatation in sections encompassing the PAG by standard cytoarquitectonic stannings. For the LC, immunodetection of the noradrenaline-synthetizing enzyme tyrosine hydroxylase (TH) was performed, due to the noradrenergic nature of the LC neurons. The following pain-related parameters were measured: pain behavioural responses in a validated pain inflammatory test (the formalin test) and the nociceptive activation of spinal cord neurons.

Results: In general, rats with hydrocephalus presented a higher dilatation of the 4th ventricle, along with a higher area of the PAG. Increases in the levels of TH in the LC, were detected in hydrocephalic animals. A decrease in behavioral responses was detected in these rats, namely in the second phase of the test (inflammatory phase).

Conclusions: Collectively, the results of the behavioral studies indicate that rats with hydrocephalus exhibit hypoalgesia. Since the LC has higher levels of TH in these rats, it is possible that an increase in the release of noradrenaline at the spinal cord accounts for pain inhibition.