



ORAL PRESENTATION

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# Association between inflammatory extension and the ventricular size in adult chronic communicating hydrocephalus: An experimental model of adult hydrocephalus

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## Introduction

The pathogenesis of normal pressure hydrocephalus (NPH) is not fully understood and the relationship between inflammatory reaction extension and the ventricular enlargement is unknown.

## Methods

Bilateral subarachnoidal injection of kaolin was administered in the cranial convexities of 20 adult rats. MRI was obtained using a Bruker Biospec 11.7 T MRI scanner at 14, 60, 90 and 120 days post kaolin injection. Radiological kaolin extension was defined by the number of kaolin locations showed in the MRI studies. At the end of the experiment, the heads of the rats were decalcified and sliced along with the skull in order to preserve the meninges and bone. A blinded neuropathologist studied the anatomical preparations and analyzed kaolin extension and the inflammatory and fibrotic response.

## Results

Radiological ventricular size showed progressive growth over time at all times ( $p < 0.0001$ ). The fastest ventricular enlargement happened within the first 2 months. Pathological specimens revealed kaolin location at the subarachnoidal space. The extension of the kaolin migration was heterogeneous among rats. Inflammatory and fibrotic

response was present at the cranial convexities in all rats, adjacent to superior sagittal sinus in 94% rats, at the inter-hemispheric fissure in 56% rats, at the Olfactory Bulb in 61% rats, at the anterior basal cisterns in 72% rats, supracerebellar in 56% rats, at the quadrigeminal cisterns in 61% rats, at the lateral midbrain cisterns in 50% rats and within the Virchow-Robin spaces in 61% rats. The extension of the inflammatory response in the subarachnoidal space was associated with ventricular size ( $p = 0.02$ ), and the rate of ventricular enlargement ( $p = 0.03$ ).

## Conclusions

The extension of the inflammatory response to kaolin injected in the subarachnoidal space is associated with ventricular size and the rate of ventricular enlargement in adult rats.

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