

Neuropathological events in an animal model resembling human fetal post-hemorrhagic hydrocephalus

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Introduction

In premature newborns, intraventricular hemorrhages (IVH) probably trigger the disruption of the neurogenic ventricular zone. Most of the cases with severe IVH develop post-hemorrhagic hydrocephalus (PHH). A mouse model with IVH has been developed to research into the common neuropathological events present in PHH and into possible therapies.

Methods

In two-day-old mice, the blood serum from littermates was injected into the ganglionic eminence of one hemisphere or both hemispheres. Fourteen days later, a histopathological analysis was carried out. In the case of injection in one hemisphere, the effects were compared with the contralateral non-injected hemisphere.

Results

Mice with IVH developed the following neuropathological effects. The ependyma was found denuded and replaced by reactive astrocytes. A reaction of astrocytes over-expressing aquaporin-4 and of NG2 cells was also found developed in the white matter. Alterations in the neurogenesis were also common in the ventricular zone and in the white matter.

Conclusions

The animal model of IVH developed shows similar neuropathological events to other forms of congenital hydrocephalus and can be used to research into therapies for PHH.

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