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Anti-Reissner's fibre and anti-p73 co-expression in the subcommissural organ of the mice and rats with spontaneous hydrocephalus

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Background

Reissner's fibre (RF) is formed by the polymerisation of the glycoprotein secreted by the subcommissural organ (SCO). The SCO also secretes soluble glycoprotein into the cerebrospinal fluid (CSF), variations in the RF and SCO have been reported in hydrocephalus. The protein p73 belongs to the tumor suppressor factor family, which also includes p53 and p63. The p73 has several isoforms: the transactivating (TA) isoform that induces apoptosis through p53 target genes and the N-terminal truncated (ΔN) isoform whose levels are dramatically decreased when there is sympathetic neuron apoptosis. Thereafter, p73 isoform equilibrium is involved in neuronal survival and death. In the present work, we analyze the variations of RF and p73 co-expression in the CSF and SCO of the spontaneously hydrocephalus mouse and rat.

Materials and methods

Brains from mice and rats with spontaneous hydrocephalus of 5 and 12 months of age respectively were used. Control mice and control rats (CoR) of the same ages were also used. The paraffin section containing the SCO was immunohistochemically processed with anti-TAp73, anti-ΔNp73 anti-Reissner fibre (AFRU). p73 and AFRU band were also detected in the CSF by western blot.

Results

The different parts of the subcommissural organ ependymal and hypendymal cells showed AFRU immunoreactive material (ir) which was altered in the mice and rats with spontaneous hydrocephalus. The anti-TAp73 was present in the apical part of the SCO ependymal cells, while the hypendymal cell did not show Tap73-ir, the hydrocephalic animals also showed Tap73-ir but with an important variation in its expression when compared with the control. However, the ΔNp73 was expressed in the cellular nucleus but was scarcely present in the SCO of both rat and mouse groups. The choroideus plexus and other brain structures showed both the isoforms of p73 immunoreactive material with some differences when the mouse and rat groups were compared. This result could mean that the glycoprotein of Reissner's fibre and the Tap73 are interconnected in the functions of the SCO in this kind of animal, which produce alterations in the subcommissural organ secretions. Protein bands were found in the CSF of the hydrocephalic rats that were scarcely

present or almost undetectable in the CSF of the control rats.

Conclusion

Hydrocephalus produces alterations in the secretions of the SCO of the mouse and rat and Tap73 protein could play a role in the normal function of the SCO, since TAp73 is interconnected with glycoprotein secreted by the SCO. The alteration of this interconnection produces changes in the secretions of the circumventricular structures and consequently variations of some of the proteins in the CSF.