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Expression of certain cerebrospinal fluid proteins in hydrocephalus and aging. A study on WKY rats

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Background

Cerebrospinal fluid (CSF) is a functional system closely connected with the brain and the changes in the protein composition of CSF could mean an alteration of the brain as an expression of encephalic disorders. The CSF absolute protein concentration is age-dependent; the CSF mean protein concentrations range from 15–45 mg/dl, but this is quite similar in different species. It has been demonstrated that the CSF protein composition is altered in hydrocephalus and alterations in CSF composition characterize many pathological processes of the central nervous system. In the present work we study the interrelationship between hydrocephalus and aging to explore CSF proteins with anti-p73 and anti-Reissner's fibre (AFRU).

Materials and methods

Cerebrospinal fluid from cistern magna of control WKY rats of 6 and 11–12 months of age, and CSF from induced hydrocephalus (I-WKY) and spontaneously hydrocephalic rats (SH-WKY) of 6 and 11–12 months of age were used. AFRU and p-73 were identified in CSF by western blot analysis. Immunocytochemical study with AFRU and anti-p73 of several circumventricular structures was also performed.

Results

Protein bands were found in the CSF of the WKY rats that were scarcely present or almost undetectable in the CSF of the hydrocephalic rats. AFRU bands were identified in the CSF of three rat groups with variations between them. The protein p73 was found in the CSF of the control WKY and hydrocephalic rats. The subcommissural organ was more intensively marked in the WKY than in the hydrocephalic rats with AFRU. The choroid plexus showed p-73 immunoreactive material and no differences were found when the three rat groups were compared.

Conclusion

These results could mean that aging and hydrocephalus are interconnected in this kind of rat, which produce alterations in the secretions of the circumventricular structures and consequently of certain proteins of the CSF.