

Abstract submitted for presentation to the 6th International Congress of the International Association for the Scientific Study of Mental Deficiency, August 22-26, 1982, Toronto, Canada.

Growth Factors and Fibroblast Growth Factor Receptors in
Cerebral Gigantism

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Cerebral gigantism is an unusual affliction marked by macrosomia, macrocephaly and almost universally mental retardation. In order to elucidate possible causes for the abnormal growth in these individuals, a number of serum and plasma derived growth factors from two children with cerebral gigantism were assayed using novel methodologies. In addition, growth factor receptors and growth kinetics were studied in skin biopsy derived fibroblast tissue cultures from one child.

Routine laboratory parameters were unremarkable in both children. Serum thyroid functions, growth hormone, somatomedin C (SC), nerve growth factor (bioassay) and epidermal growth factor (EGF, radioreceptor assay) levels were also unremarkable. Skin biopsy derived fibroblasts from one child, when grown in confluent monolayer culture, demonstrated EGF and SC receptor concentrations which did not differ from adult and age matched controls. Qualitative growth kinetics of these fibroblasts were also unremarkable.

Serum and plasma protein dialysate from one child (17 m. old), in the concentration range of 10 to 100 $\mu\text{g/ml}$, significantly stimulated the growth of AKR-2B mouse fibroblasts in tissue culture when compared to adult and age matched controls. This effect was reproducible. Similar assays from a 7 m. old child produced results which did not differ from controls. Stimulation of NRK rat fibroblasts in tissue culture resulted in irreproducible results.

These results indicate that currently assayable growth factors and fibroblast receptors for EGF and SC are unremarkable in cerebral gigantism. The serum and plasma protein stimulation of AKR-2B mouse fibroblast growth in one child may be a demonstration of a novel growth factor in this condition, worthy of further investigation.