

Radioreceptor Assay for Somatomedin A

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Several growth hormone dependent factors have been purified from human serum. The factor stimulating sulphate incorporation into chick embryonic cartilage was designated somatomedin A. Human placenta was shown to be rich in binding sites for somatomedin A. This finding was utilized to develop a radioreceptor assay for the determination of somatomedin A in serum.

Methods. Iodination of somatomedin A was performed by the peroxidase method. A particulate plasma membrane fraction from human placenta was prepared by stepwise ultracentrifugation. Membrane, labeled somatomedin and the sample to be tested were incubated in 0.05 M Tris-HCl, pH 7.4 containing 1% albumine at +4°C for 16 hours. Membrane bound and free somatomedin A were separated by centrifugation.

Results. The binding of ^{125}I -somatomedin A to human placental membrane was time and temperature dependent. At 37°C about 40% of the labeled somatomedin A was degraded but this dramatically reduced at +4°C. The bound ^{125}I -somatomedin A was displaced by physiological

amounts of somatomedin A. Both somatomedin C and insulin could interfere with the binding sites but it was necessary to use 1000 times more insulin than somatomedin A. Human serum caused a dose-dependent displacement of ^{125}I -somatomedin A and the curve was parallel with that of somatomedin A. The addition of the somatomedin A preparation to different sera gave the expected recovery. The mean levels of somatomedin A in sera from patients with growth hormone deficiency and those with acromegaly were 0.44 U/ml and 3.02 U/ml respectively. The somatomedin A values in sera from patients with primary hypothyroidism and Turner's syndrome were within the range of normal subjects. The levels of somatomedin A in patients with acromegaly decreased after transphenoidal hypophysectomy.

Conclusion. The radioreceptor assay for somatomedin A proved to be a useful and simple method for establishing the levels of somatomedin A.