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STUDY OF GLYCOSYLATION OF HUMAN LENS PROTEINS IN RELATION TO THE DEVELOPMENT OF CATERACT

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Although the aggregation of human lens proteins and the formation of disulphide cross linkages are supposed to be the causes of the cateractogenesis, recently it has been demonstrated that a high glucose environment increases the glycosylation of α-crystalline lens proteins in vivo and vitro with subsequent opacification of the protein matrix resembling that seen in diabetic cateracts.

This paper deals with the study of the carbohydrate content in normal and cateractous lenses. Both cateractous and normal lenses were homogenised in Tris HCl buffer (7.6) and the soluble and insoluble proteins were obtained. The carbohydrate content in each of the fractions was determined by the colorimetric method for determination of sugars and glycoproteins etc. described by Dubois. It was found that the total carbohydrate content/mg of protein varied from 0.6—1% for normal lenses and 0.5—1% for cateractous lenses, but the carbohydrate content (0.05%) in soluble protein fraction of cateractous lenses is much less than that of insoluble protein fraction (0.2%) whereas the carbohydrate content of insoluble proteins of normal lenses (0.12%) is less than that of soluble proteins (0.15%)

An attempt was made to analyse the carbohydrate moiety by chemical hydrolysis followed by paper chromatography. This was not successful. It may be attributed to the low carbohydrate percentage and the use of small quantities of lens proteins.

At present, enzymic methods for hydrolysis and gas liquid chromatographic analysis are being tried out.

References :

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