Title: Spermine can modulate the abnormal changes of structure and function of fibrinogen at high glucose concentration

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Abstract: Background: Fibrinogen is involved in hemostasis system and its abnormal function in type 2 diabetes is one of the important reasons for diabetic complications. Glycation of fibrinogen alters its structure and function and increases the risk of embolism in cardiovascular system of diabetic patients. L-Lysine as a chemical chaperone inhibits protein glycation and improves the diabetic complications. Therefore we investigated the effect of Lys on fibrinogen glycation.

Methods: Fibrinogen was incubated in the presence or absence of L-Lysine and high glucose concentration (50 to 400 mmol/L). The samples were retained for 4 months. The aliquots were given each two week. Then, they were analyzed by fluorescence spectroscopy, circular dichroism spectroscopy (CD), polyacryl amide gel electrophoresis (PAGE) and sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE). Its activity was also investigated.

Results: Structure and activity of fibrinogen were changed due to the glycation. L-Lysine as a chemical chaperone inhibited this phenomenon and the fluorescence emission, α helix and β sheet content, electrophoretic mobility and function of fibrinogen were closed to the normal values. Conclusions: Our results indicated a decrease in fibrinogen glycation by glucose in the presence of L-Lysine. It implies the usefulness of this amino acid in reduction of diabetes complications.

Fibrinogen; High glucose concentration; L-Lysine; type 2 Diabetes; structure and function.

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