HEMOSTATIC BIOMARKERS IN SELECTED GROUP OF PATIENTS WITH TYPE 1 DIABETES: ARE THEY ASSOCIATED WITH DIFFERENT DEGREES OF DIABETIC RETINOPATHY

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BACKGROUND

- Diabetic retinopathy (DR) is the leading cause of blindness in the world.
- Retinopathy and nephropathy can still progress in diabetics despite optimal metabolic control.
- This suggests that factors other than hyperglycemia, such as abnormal hemostatic parameters, may play a role in the disease pathogenesis. Based on this hypothesis, several markers of hypercoagulation including fibrinogen, plasma activator inhibitor (PAI), and alpha-2-anti plasmin have been identified.
- The aim of the present study was to determine whether different degrees of DR (proliferative or non-proliferative) were associated with abnormally modulated hemostatic parameters in patients with type 1 diabetes mellitus (DM).

MATERIALS AND METHODS

- 52 type 1 diabetic patients and 40 healthy controls were enrolled in the study. Patients were then subdivided into three categories. Group I was defined as those without retinopathy, group II with non-proliferative retinopathy (NPRP), and group III with proliferative retinopathy (PRP).
- We have compared these subgroups with each other and the control group (group IV) according to the serum fibrinogen, plasminogen, α2-anti-plasmin, and PAI.

RESULTS

- We detected that PAI-1 levels were higher in the diabetic groups than control, but this was not statistically significant whereas serum fibrinogen (p=0.224) and plasminogen (p=0.224) were similar between the diabetic and control groups.
- Alpha-2-anti-plasmin in groups I, II, and III was higher compared to the control group (p<0.01, p<0.05, and p<0.001, respectively) and the positive correlation identified between serum α2-anti-plasmin and HbA1c levels (r=0.268, p=0.031).

Table: Biochemical and hemostatic measurements of diabetic patients and healthy controls

Variables	Group I (n:21)	Group II (n:18)	Group III (n:13)	Group IV (n:40)	p-değeri
HbA1c	9,2 (6,6-11,0)[a]	9,2 (6,0-11,0)[b]	8,5 (5,6-12,0)[c]	5,3 (4,4-6,3)[a,b,c]	<0,001
PAI	182,7 (9,4-271,0)	158,0 (7,9-255,2)	162,1 (7,9-246,7)	155,6 (107,2-236,9)	0,209
α2Antiplasmin	245,0 (31,0-650,0)[a]	202,0 (55,0-904,0)[b]	418,0 (42,0-1184,0)[c]	115,5 (23,0-591,0)[a,b,c]	0,004
Plasminogen	90,0 (69,0-152,0)	102,0 (55,0-141,0)	107,0 (57,0-133,0)	87,0 (68,0-121,0)	0,244
Fibrinogen	259,8±72,6	277,3±62,8	307,1±81,3	272,1±42,3	0,224

a:Difference between Grup I and Grup IV is significant (p<0,01), b: Difference between Grup II and Grup IV is significant (p<0,05), c: Difference between Grup II and Grup IV is significant (p<0,001).

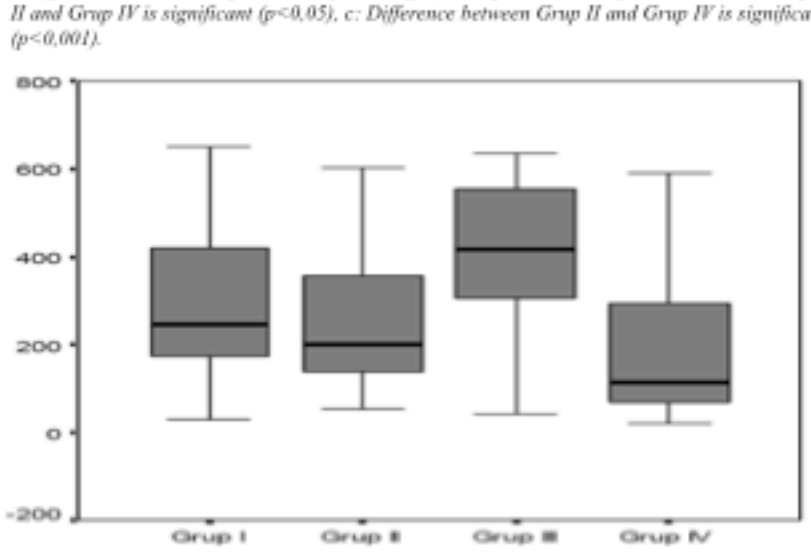

Figure: Expression of α2-antiplasmin in the diabetic and control groups

CONCLUSION:

- To our knowledge there are only a small number of studies measuring α2- antiplasmin levels in type 1 diabetes.
- A positive correlation between α2 anti-plasmin with HbA1c suggests that fibrinolytic markers may improve with disease regulation, and better glycemic control.
- High α2-anti-plasmin level might be a novel risk factor for development of DR. Confirmation of these data would allow a better understanding of the pathogenesis of DR.