

The role of fetuin A as a biomarker of atherosclerosis and its relation to type 2 diabetes

Nermeen Sheriba*, Rania Sayed*, Merhan Samy* and Sara Shelbaya * Magdy Abbas**

*Department of Internal Medicine, ** fellow of chemistry, Ain Shams University Hospital. Cairo, Egypt

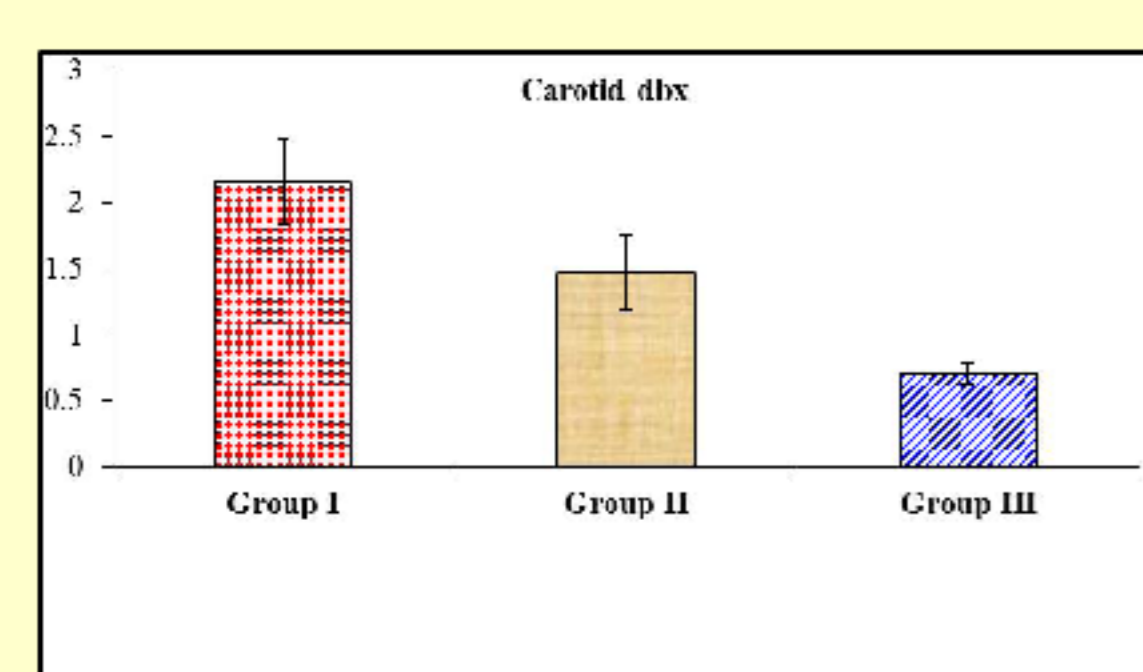
OBJECTIVES

Hyperglycemia produces various changes in the vascular tissue at the cellular level that accelerates the atherosclerosis¹. There is a direct correlation among carotid arterial stiffness and the serum fetuin-A level. It is a calcium regulatory glycoprotein and inhibits vascular calcification, which is related to the inflammation.²

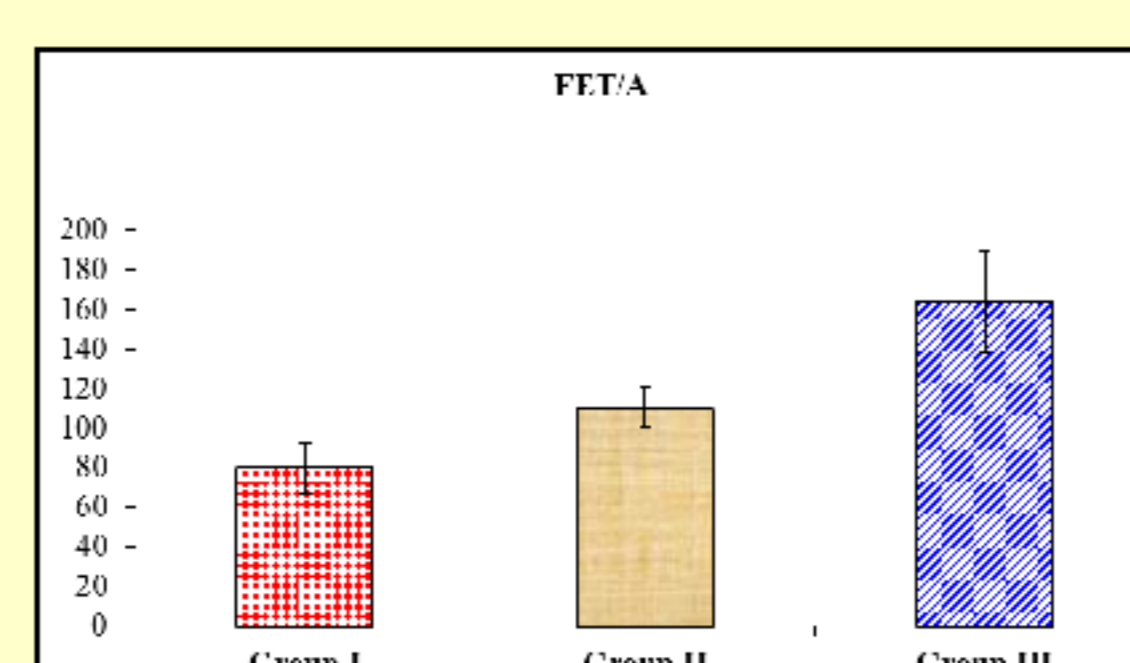
We aimed to study the role of fetuin A in atherosclerosis and its association with type 2 diabetes

METHODS

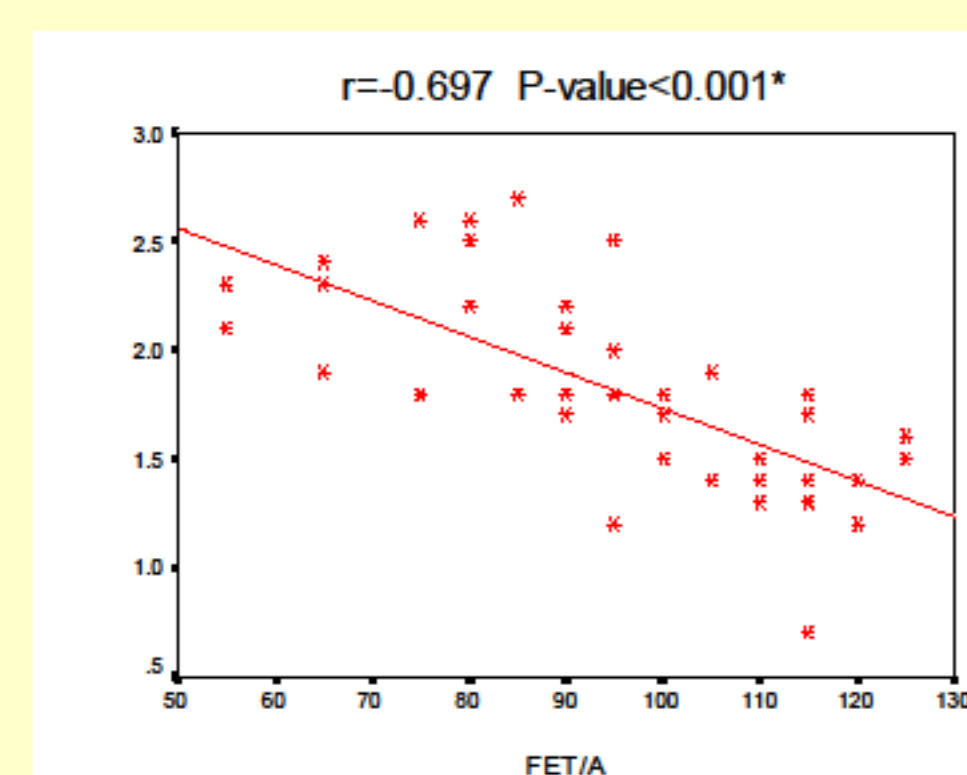
This cross sectional study was conducted on 50 subjects aged from 40 to 60 years old divided into Group I: 20 T2DM patients having atherosclerosis . Group II: 20 non diabetic patients having atherosclerosis . Group III: 10 healthy subjects as control group They were subjected to full clinical history, thorough clinical examination, laboratory investigations including fasting and 2-hour postprandial blood glucose level, HbA1c, lipid profile , measurement of plasma fetuin-A level using ELISA and measurement of carotid intimal thickness using duplex ultrasound.



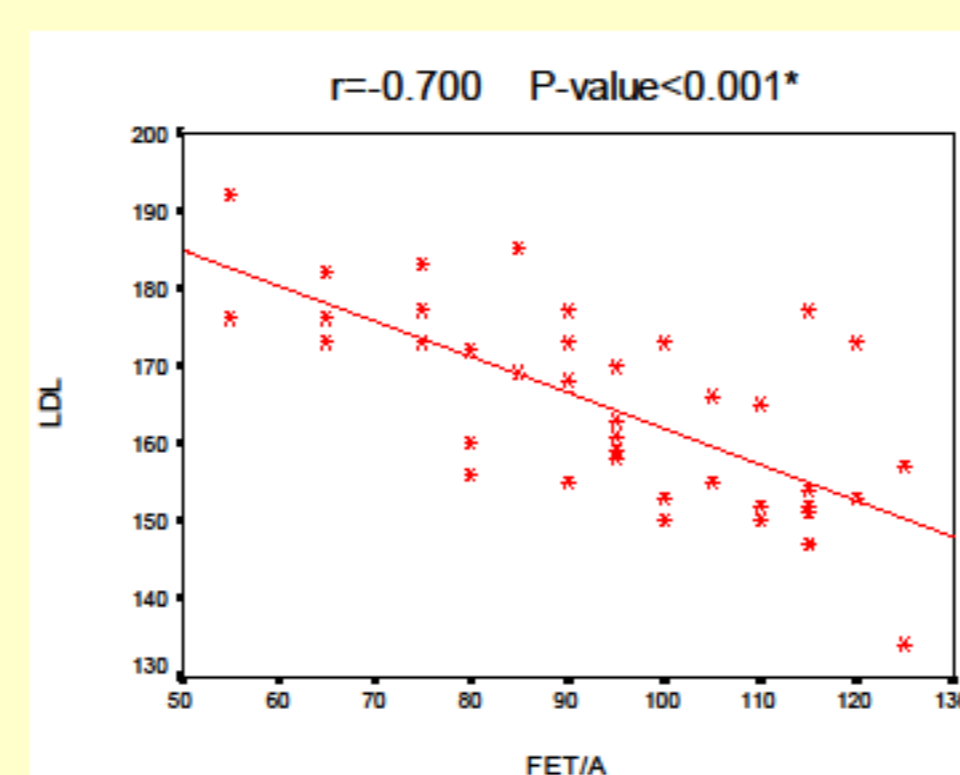
Comparison between 3 groups regarding the Carotid intimal thickness



Comparison between 3 groups regarding the FET/A.



Correlation between fetuin A and carotid intimal thickness



Correlation between fetuin A and LDL-c.

Items	Groups		Tests	
	Group(1) (n=20)	Group(2) (n=20)	F or χ^2	P-value
Sex n(%)				
Female	9(45%)	9(45%)	0.080	0.961
Male	11(55%)	11(55%)		
Mean Age (years)	51.9 ± 7.454	54.6 ± 6.684	4.306	0.415
Smoking	6(30%)	4(20%)	0.649	0.723
SBP	164.0 ± 9.899	149.75 ± 12.191	35.53	<math>< 0.001^*</math>
DBP	105.7 ± 25.64	95.9 ± 6.017	6.919	0.169
Mean BMI (Kg/m ²)	32.2 ± 4.287	33.35 ± 5.143	5.804	0.682
FBG (mg/dl)	204.65 ± 52.034	90.1 ± 7.47	39.322	0.010*
PBG (mg/dl)	293.05 ± 75.163	132.4 ± 28.173	47.24	0.031
Total cholesterol (mg%)	274.35 ± 52.225	239.75 ± 37.408	17.59	<math>< 0.001^*</math>
TGD(mg%)	283.9 ± 91.183	233.85 ± 44.935	12.01	<math>< 0.001^*</math>
LDL-c	172.85 ± 9.005	155.5 ± 9.556	148.178	<math>< 0.001^*</math>
HDL-c	31.15 ± 4.705	35.100 ± 5.964	10.897	0.059
HbA1c (%)	9.16 ± 0.975	5.425 ± 0.48	127.264	0.006*
Fet-A (ng/ml)	79.75 ± 13.424	110.0 ± 10.0	97.119	<math>< 0.001^*</math>
Carotid intimal thickness	2.155 ± 0.322	1.47 ± 0.279	96.781	<math>< 0.001^*</math>

comparison between Group (1) and Group (2) regarding their demographic data and different parameters using ANOVA.

RESULTS

There was a highly significant difference between the 3 groups as regard SBP, DBP, FBG, PBG , HbA1c, TG, HDL-c , LDL-c , carotid intimal thickness and Fetuin A level ($P < 0.001$) and on comparing the diabetics with atherosclerosis (Group I) with non diabetics with atherosclerosis (Group II) we found a highly statistical significant decrease in plasma Fetuin-A level ($P < 0.001$) being lower in group (I) and a highly significant increase in carotid intimal thickness , SBP and LDL-c ($P < 0.001$) in group (I). We also found a highly significant negative correlation between fetuin-A and SBP, LDL-c and carotid intimal thickness ($P < 0.001$). A significant positive correlation was also found between carotid intimal thickness and SBP, HbA1c and LDL-c ($P < 0.05$) .We found that the cutoff point of Fetuin A level using the ROC curve is 125ug/ml with 100% sensitivity,90% specificity, 97.1% accuracy and a positive predictive value of 97.6%.

CONCLUSIONS

Our results postulate that there is an association between lower plasma fetuin-A level and the development of atherosclerosis especially in those having type 2 diabetes.

References

- 1.Aronson D and Rayfield EJ. How hyper- glycemia promotes atherosclerosis: molecular mechanismms. Cardiovasc Diabetol 2002;1:1.
- 2.Stenvinkel P et al. Low fetuin-A levels are associated with cardiovascular death: impact of variations in the gene encoding fetuin. Kidney Int 2005; 67: 2383–2392.

