



FETUIN-A AS A MARKER OF CARDIOVASCULAR RISK IN PATIENTS WITH TYPE 2 DIABETES



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INTRODUCTION

It's known that type 2 diabetes increases the risk of cardiovascular disease. FETUIN-A (AHSG; α 2-Heremans Schmid Glycoprotein) is a multifunctional plasma glycoprotein with a molecular weight of 60kDa and a half-life of several days. It was first discovered in 1944 by Kai O. Pedersen in calf serum. Several years later, J.F. Heremans (1960) and K. Schmid with W. Burgi (1961), in the independent studies, isolated it from human serum.

During fetal development FETUIN-A is abundantly synthesized by multiple tissues. In the adults it is secreted predominantly by the liver (>95%).

FETUIN-A is a physiological inhibitor of insulin receptor (it inhibits the autophosphorylation of tyrosine kinase) and thus is associated with: insulin resistance, metabolic syndrome, increased risk for type 2 diabetes.

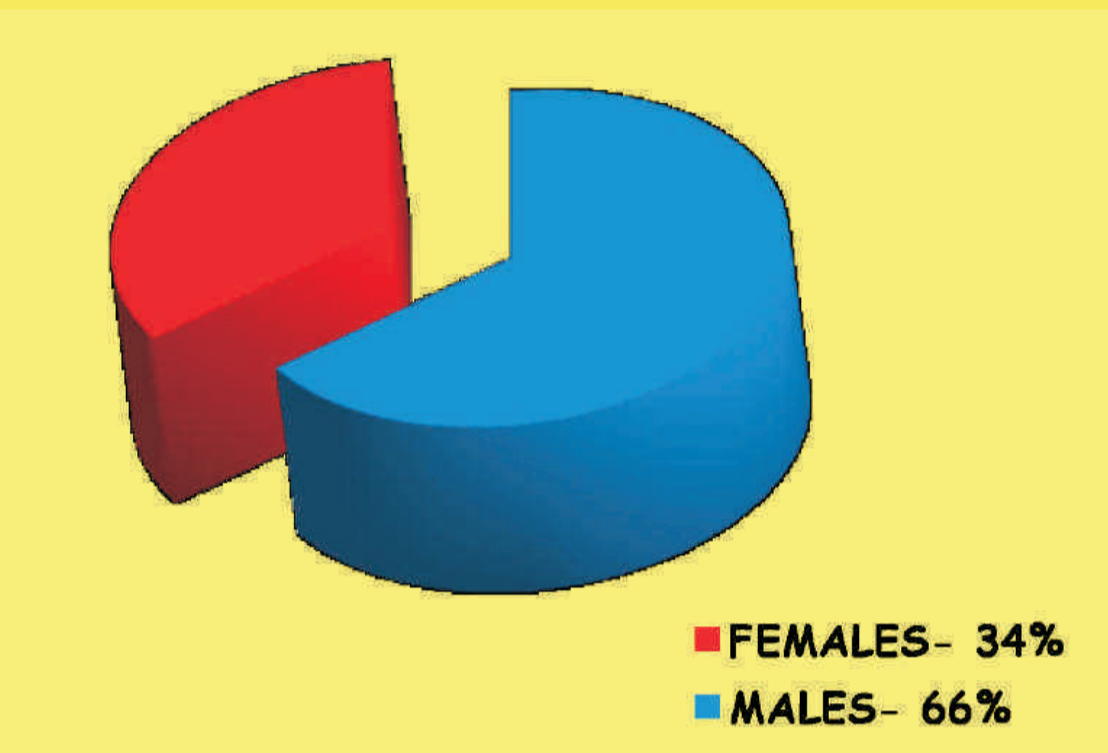
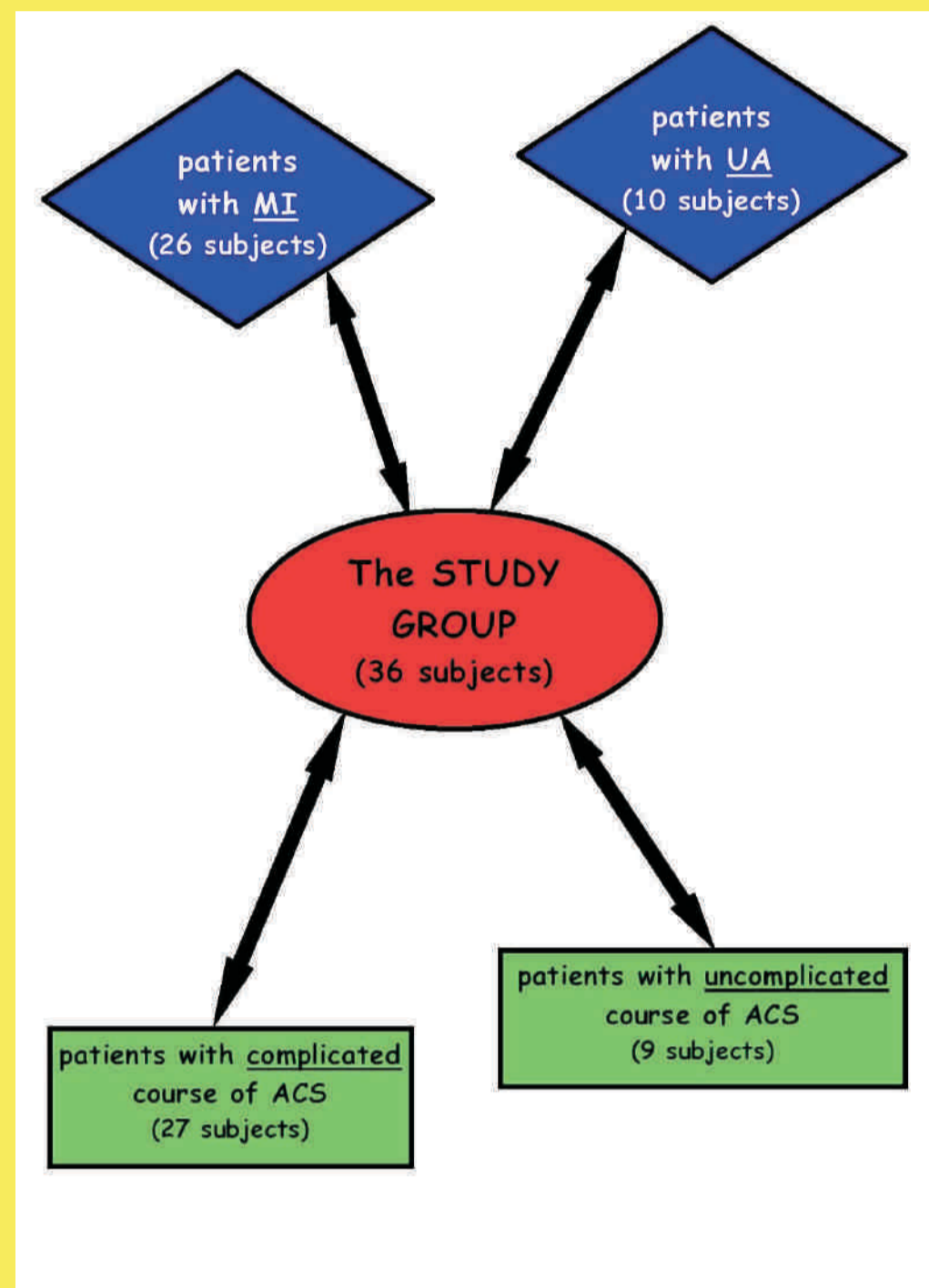
The role of FETUIN-A in the pathogenesis of: type 2 diabetes, atherosclerosis and cardiovascular disease is still discussed.

MATERIAL AND METHODS

THE STUDY was conducted IN 36 PATIENTS (12 females and 24 males) with type 2 diabetes (DM2) and acute coronary syndrome (ACS), treated at the Department of Cardiology in the Independent Public Clinical Hospital No. 4 in Lublin.

THE STUDY GROUP was divided into subgroups:

- 26 subjects with myocardial infarction (MI) and 10 subjects with unstable angina (UA) as well as
- 9 subjects with uncomplicated course of ACS and 27 subjects with complications including cardiac arrhythmias, pulmonary oedema, cardiac arrest



THE CONTROL GROUP was composed of 17 PATIENTS (6 women and 11 men) with type 2 diabetes and without cardiovascular disease.

- The material for the study was the peripheral blood obtained from the ulnar vein (10ml).
- Serum was separated from the collected blood samples by centrifugation for 10 min. at 1000 rpm, aliquoted and stored frozen at -20°C until analysis.
- Serum FETUIN-A concentration was determined with the use of Human Fetuin-A ELISA Kit (an assay sensitivity of 3.5µg/ml).

RESULTS

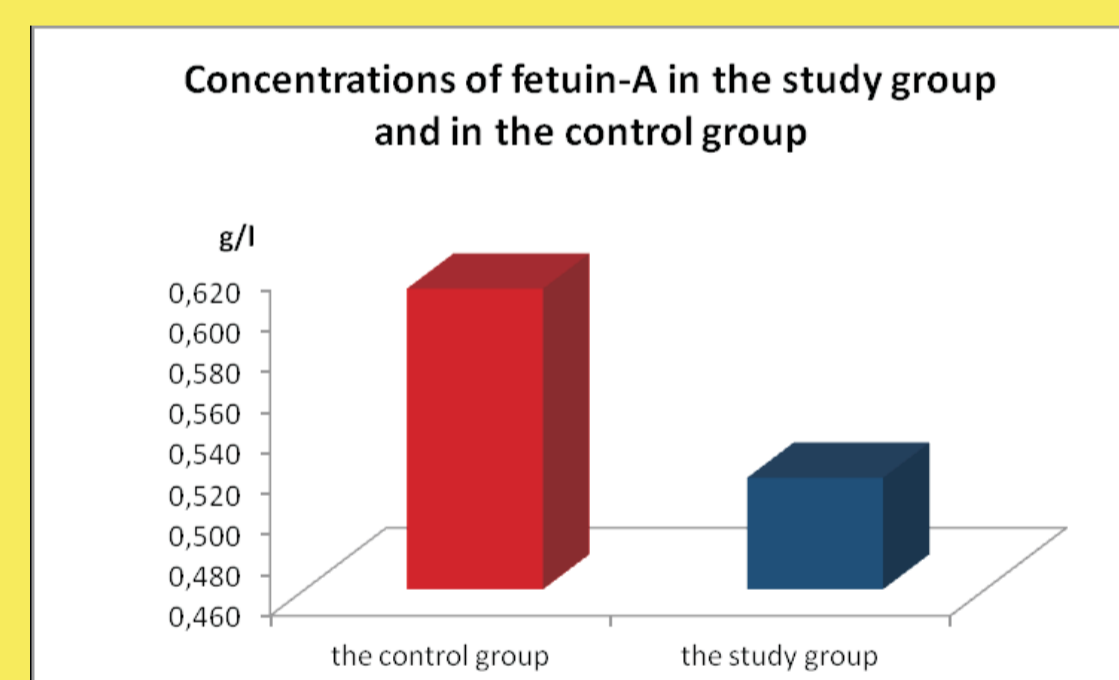
Serum levels of FETUIN-A (g/l) and selected parameters in the study group.

PARAMETERS	MEAN ± SEM
Fetuin-A (g/l)	0.515 ± 0.149
Age (years)	70.22 ± 7.62
BMI (kg/m ²)	29.43 ± 3.47
HbA1C (%)	7.21 ± 1.17
Duration of DM2 (years)	7.90 ± 6.34

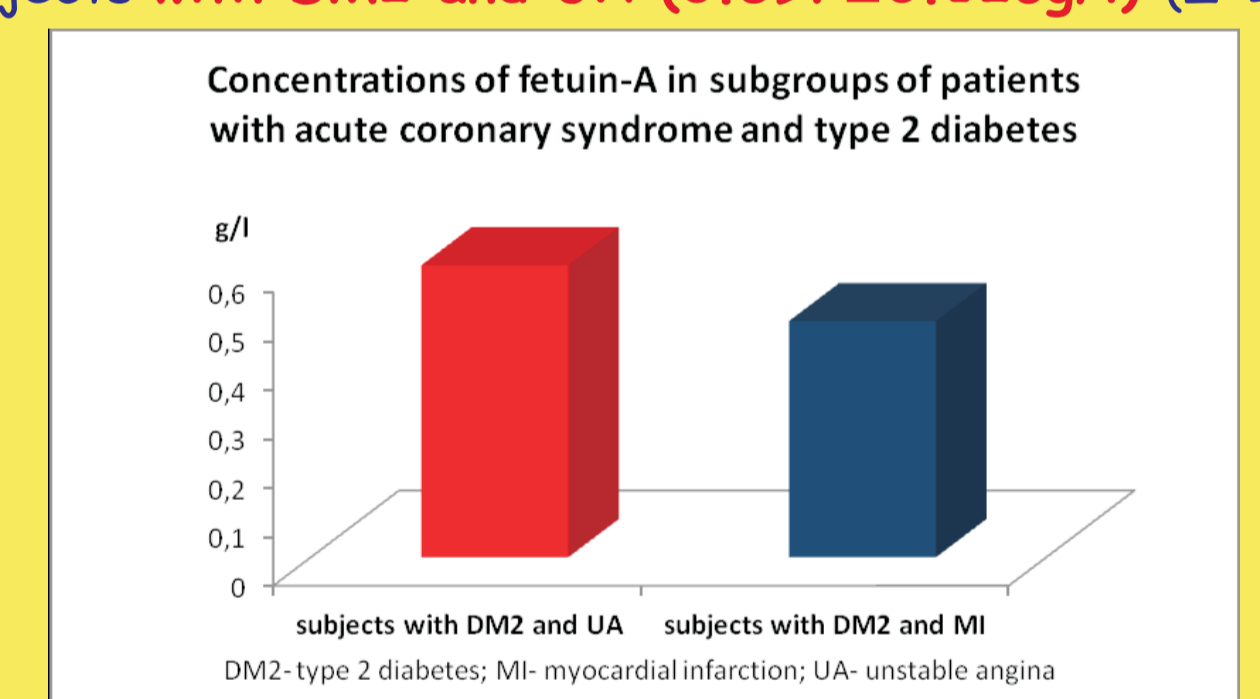
Serum levels of FETUIN-A (g/l) and selected parameters in the control group.

PARAMETERS	MEAN ± SEM
Fetuin-A (g/l)	0.608 ± 0.153
Age (years)	56.06 ± 1.77
BMI (kg/m ²)	34.07 ± 6.25
HbA1C (%)	8.30 ± 2.12
Duration of DM2 (years)	5.33 ± 6.00

Patients with DM2 and ACS had decreased FETUIN-A concentrations compared to subjects in the control group 0.515±0.149g/l vs 0.608±0.153g/l (Z=-1.984; p<0.05)



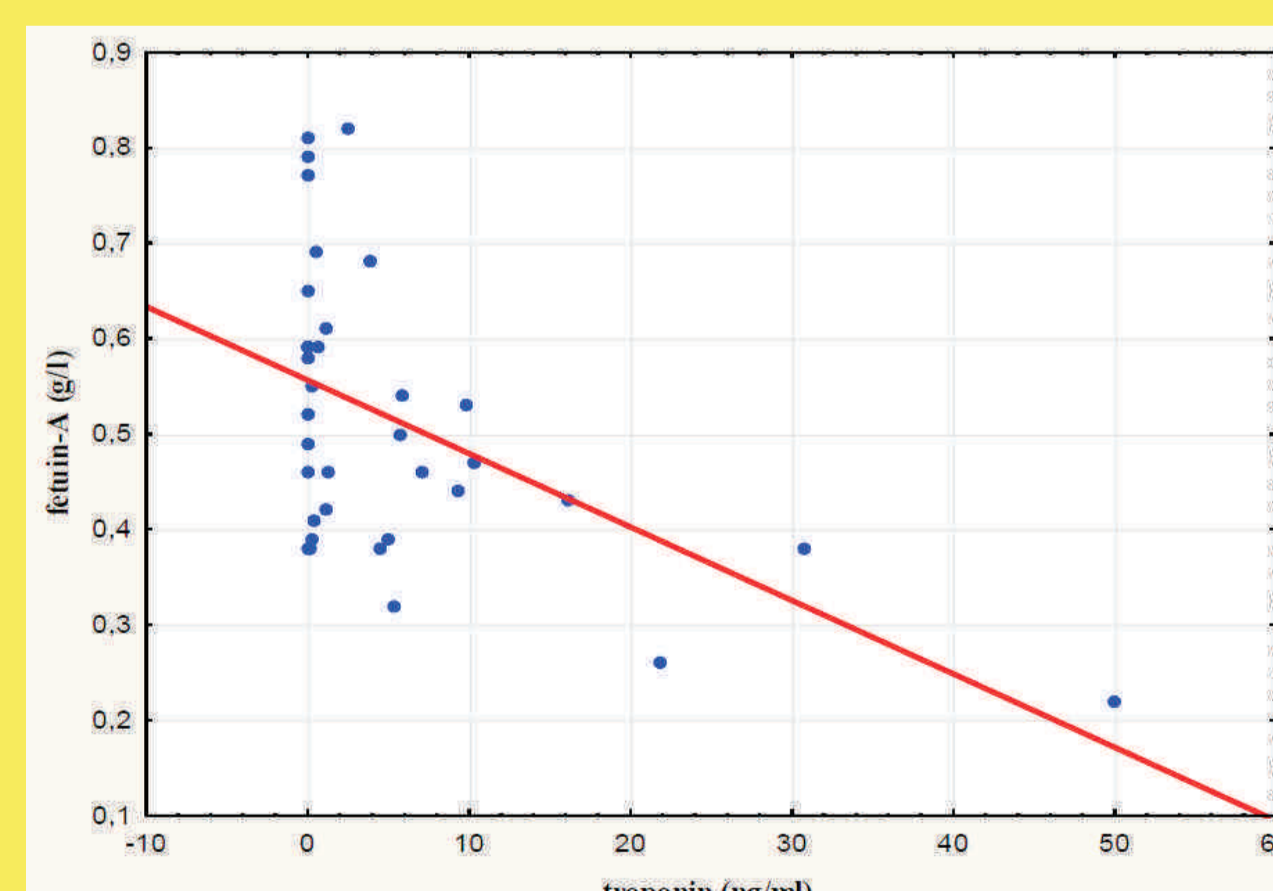
FETUIN-A levels in patients with DM2 and MI were significantly lower (0.483±0.147g/l) than in subjects with DM2 and UA (0.597±0.126g/l) (Z=2.101; p<0.05)



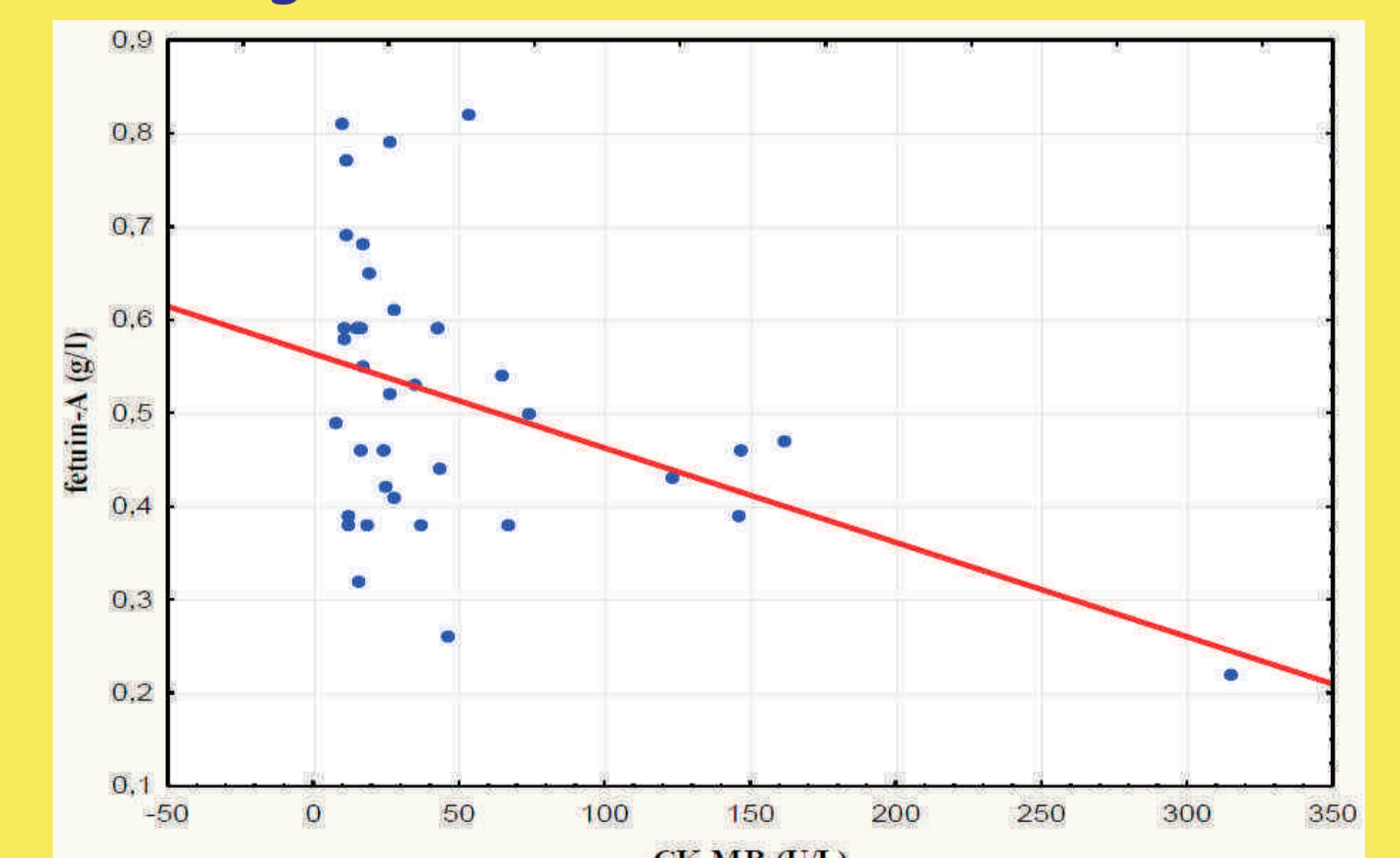
The inverse correlations between FETUIN-A serum level and troponin, CK-MB, myoglobin levels, measured few hours after MI, were observed.

VARIABLES	R		
	Spearman	t (N-2)	p
Troponin	-0.476	-3.158	0.003
CK-MB	-0.341	-2.117	0.042
Myoglobin	-0.345	-2.143	0.039

FETUIN-A serum concentration was negative correlated with troponin level (p=0.003), measured few hours after MI. Patients with higher troponin levels had lower FETUIN-A levels.

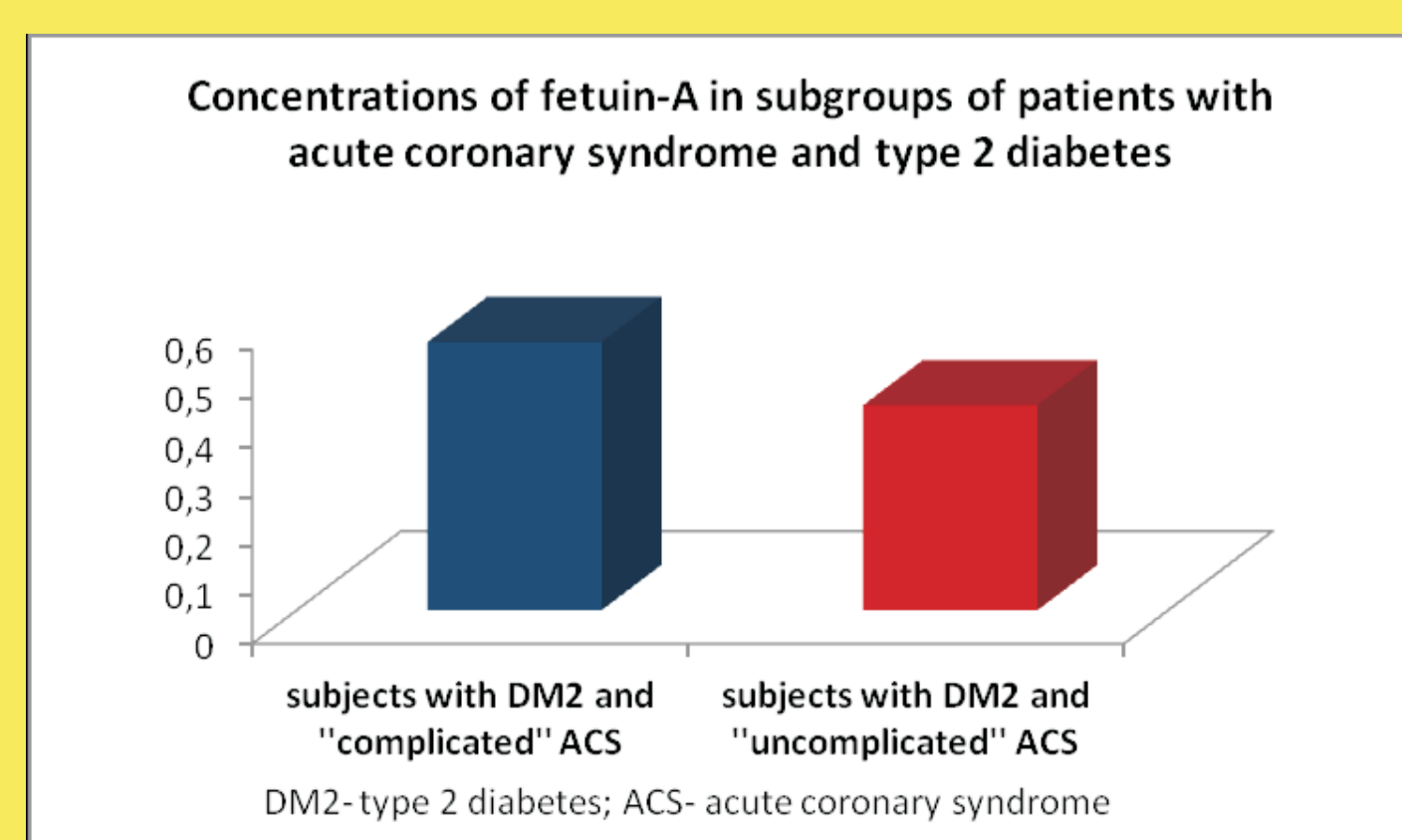
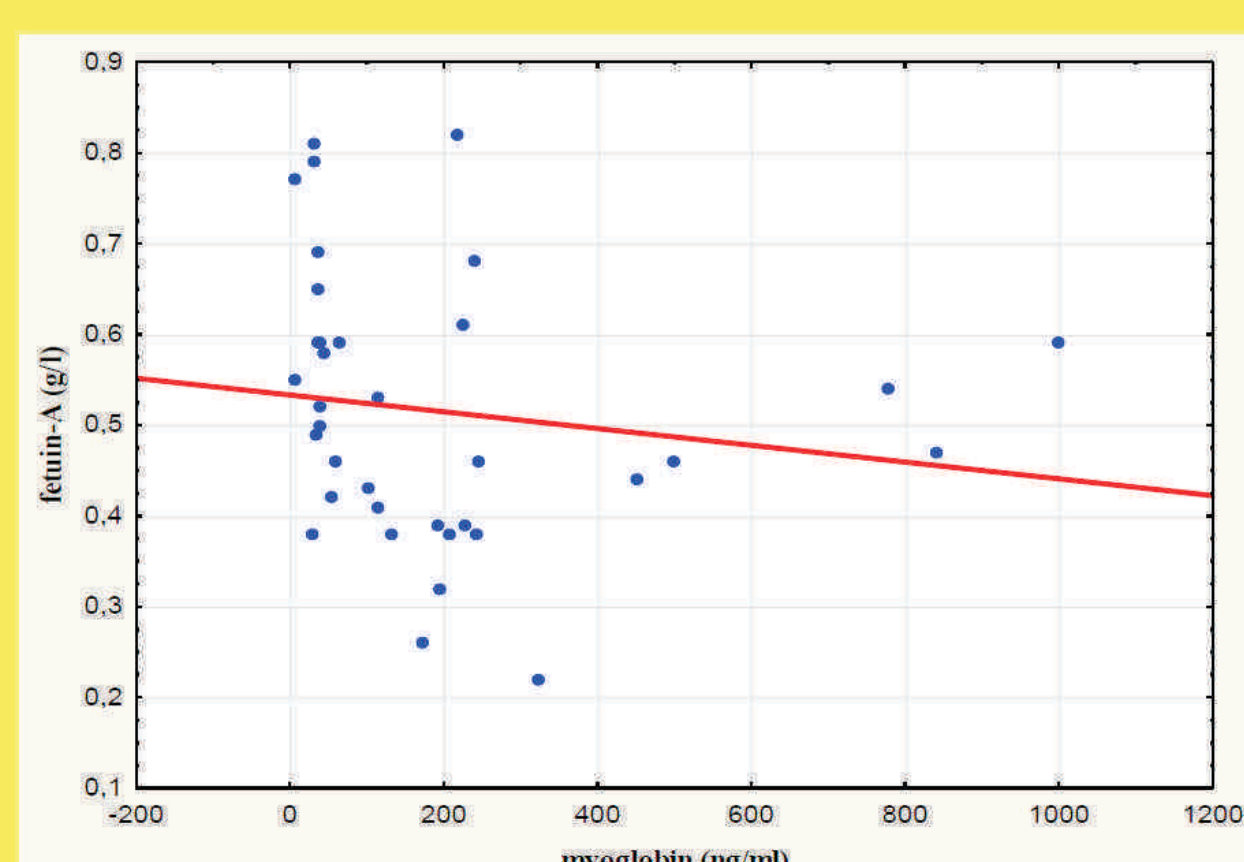


A negative correlation between FETUIN-A serum level and CK-MB concentration (p=0.042), measured few hours after MI, has been observed. Patients with higher CK-MB levels had lower FETUIN-A levels.



FETUIN-A serum concentration was negative correlated with myoglobin level (p=0.039), measured few hours after MI. FETUIN-A levels were lower in patients with higher myoglobin levels.

Higher FETUIN-A levels have been noted in subjects with DM2 and complications in the course of ACS compared to patients without complications 0.547±0.143g/l vs 0.418±0.129g/l (Z=2.155; p<0.05)



CONCLUSIONS

Serum FETUIN-A:

- 1) is decreased in patients with type 2 diabetes and acute coronary syndrome
- 2) correlates negative with severity of myocardial ischaemia
- 3) deficiency may be a predictor of cardiovascular risk and marker of ischaemia's severity in patients with type 2 diabetes