

Background and aims

Diabetes evolution is influenced both by glucose status and cardiovascular risk, among many factors. The relation between these two components is not always investigated in detail. The study evaluated the relation between cardiometabolic risk factors (CMRF) and glucose parameters evaluated by continuous glucose monitoring (CGM) in persons with type 2 diabetes (T2D).

Material and methods

DEMOGRAPHIC DATA	Mean ± SD	
Study group	30 subjects	
Gender	8 women / 22 men	
Age (years)	56.59 ± 12.19 (39-80)	
METABOLIC ASSESSMENT	Mean ± SD	
Weight (kg)	86.91 ± 11.01	
BMI (kg/m ²)	30.10 ± 4.00	
Waist circumference (cm)	107.17 ± 10.44	
SBP (mmHg)	139.17 ± 16.63	
DBP (mmHg)	82.92 ± 8.65	
Total chol (mg/dl)	206.62 ± 91.73	
HDLc (mg/dl)	43.66 ± 18.30	
LDLc (mg/dl)	107.33 ± 52.55	
Triglycerides (mg/dl)	218.28 ± 174.38	
MetS diagnosis	2005 IDF Criteria	
CMRF ASSESSMENT		
Physical activity (%)	Low / moderate / intense 53,8 / 46,2 / 0	
Smoking (%)	Nonsmoker / ex-smoker / smoker 53,8 / 38,5 / 7,7	
Alcohol intake (%)	Not at all/occasional/weekly/daily 34,9 / 61,5 / 3,8 / 0	
Personal history of CVD (%)	Yes/No 50 / 50	
Family history of Diabetes (%)	Yes/No 48,3 / 51,7	
DIABETES AND GLUCOSE STATUS	Mean ± SD (min-max)	
Diabetes duration (years)	11.43 ± 6.63 (0-30)	
Diabetes treatment	IT - 14, OT - 16	
Insulin therapy duration (years)	5.71 ± 5.45 (0-16)	
A1C (%)	8.27 ± 1.64 (6.1-12.0)	
Glucose variability (mg/dl)	37.94 ± 15.89 (15.84-88.93)	
MAGE (mg/dl)	89.59 ± 34.61 (42.54-150.40)	
Glucose parameters on glucose ranges (CGM)		
< 70 mg/dl	70-180 mg/dl	- Number of glucose values
> 180 mg/dl	90-130 mg/dl	- Area under the curve
		- Mean glucose values

References: Monnier L, Colette C. Diabetes Care 2008, vol 31, suppl 2, S150-S154. Bolli GB. Diabetes Care 2006, 29(7), 1707-9. Hirsch IB. J Diabetes Complications 2005, 19(3),178-81. Brownlee M. JAMA 2006, 295(14), 1707-8. Buse JB. Diabetes Care 2007, 30(1), 162-72. Bode BW. Diabetes Care 2005, 28(10), 2361-6. Monnier L. JAMA 2006, 295(14), 1681-7.

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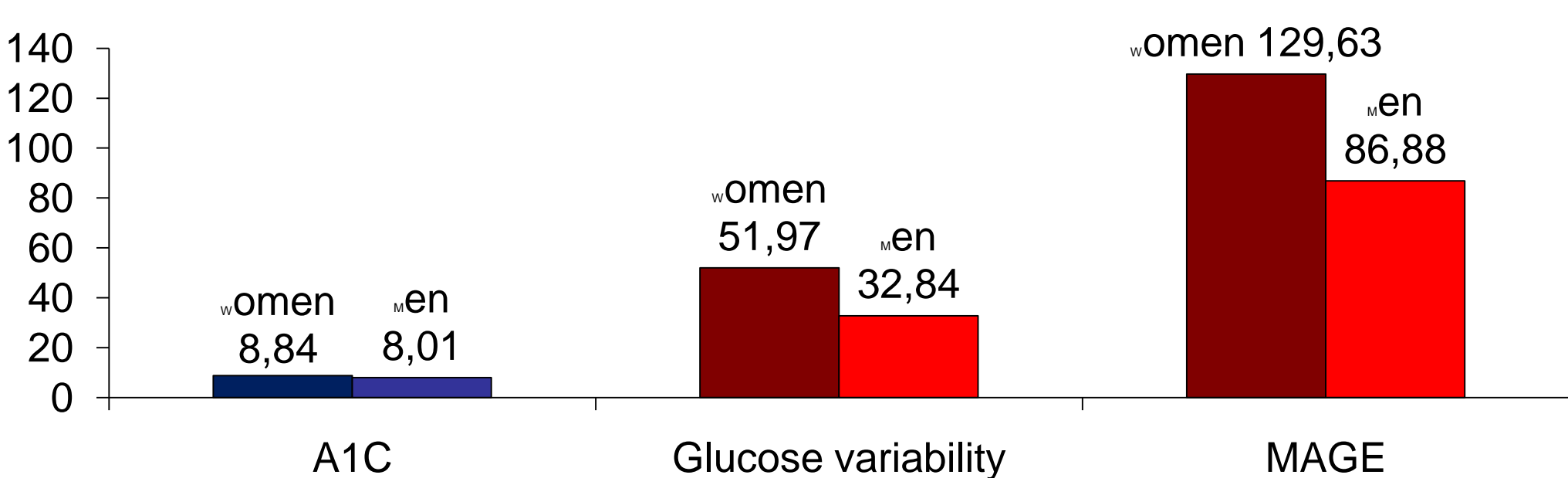
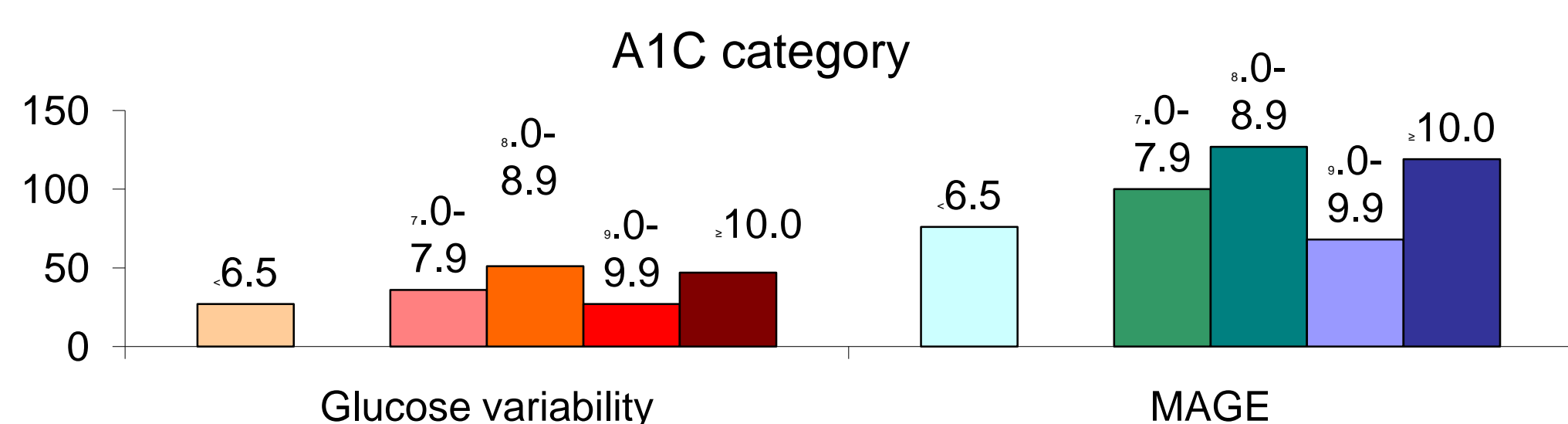
Abbreviations: BMI-body mass index, BP - blood pressure, SBP- systolic BP, DBP- diastolic BP, HBP- high blood pressure, NBP- normal blood pressure, AHT- arterial hypertension, CVD- cardiovascular disease, CMRF- cardiometabolic risk factors, chol-cholesterol, TGL-triglycerides, HDLc- high density lipoprotein cholesterol, LDLc- low density lipoprotein cholesterol, MetS-metabolic syndrome, GV- glucose variability, MAGE- mean amplitude of glucose excursions, A1C- glycated haemoglobin, AUC- area under the curve (for continuous glucose values), NGV-number of glucose values, MGV-mean glucose value, SD-standard deviation, ns-nonsignificant, IDF-International Diabetes Federation.

Results

GLUCOSE VARIABILITY, MAGE, A1C

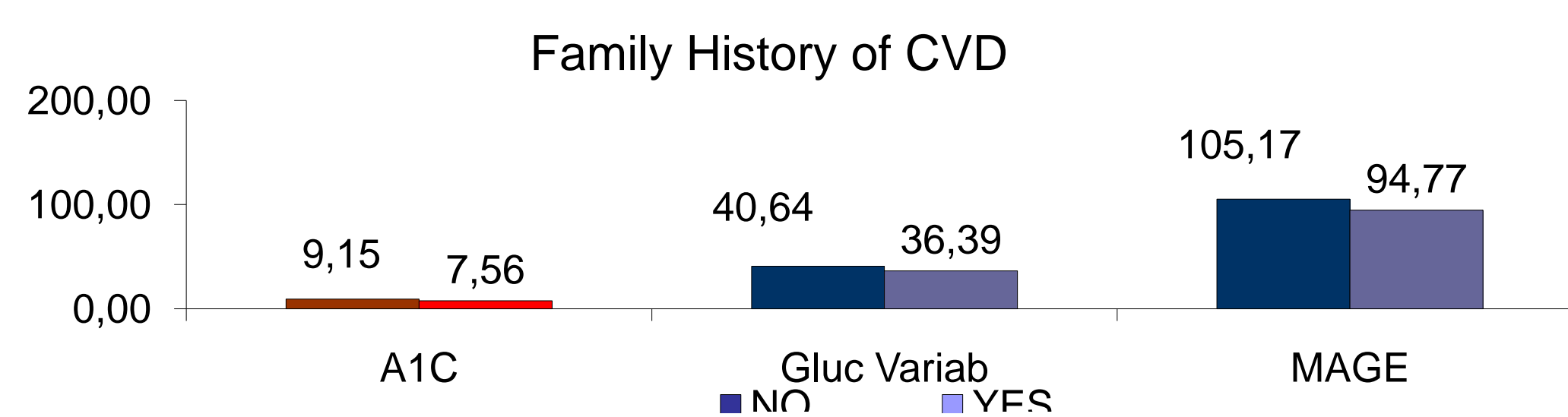
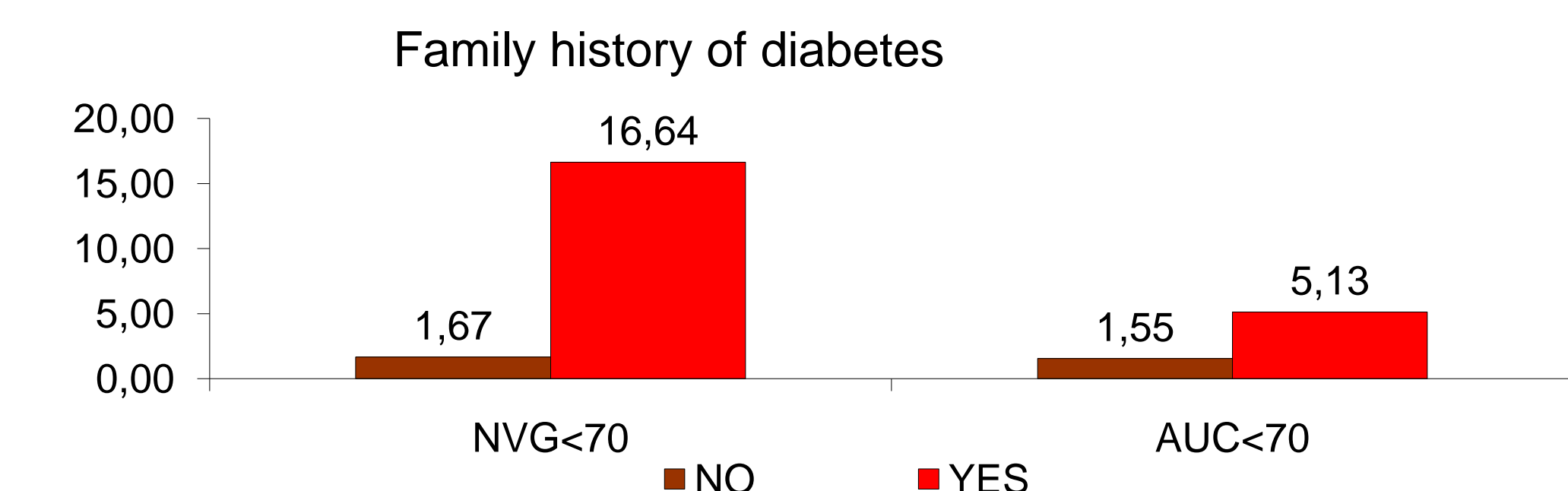
- Weight was inversely correlated with GV and MAGE
- SBP increased with diabetes duration and insulin-therapy duration

Correlation	A1C	Weight
Glucose variability	r=0.598 p=0.001	r=-0.508 p=0.004
MAGE	r=0.462 p=0.013	r=-0.421 p=0.021



FAMILY HISTORY

- Persons with family history of diabetes had higher time spent (NGV) and total AUC < 70 mg/dl.
- Persons with family history of CVD had lower A1C.



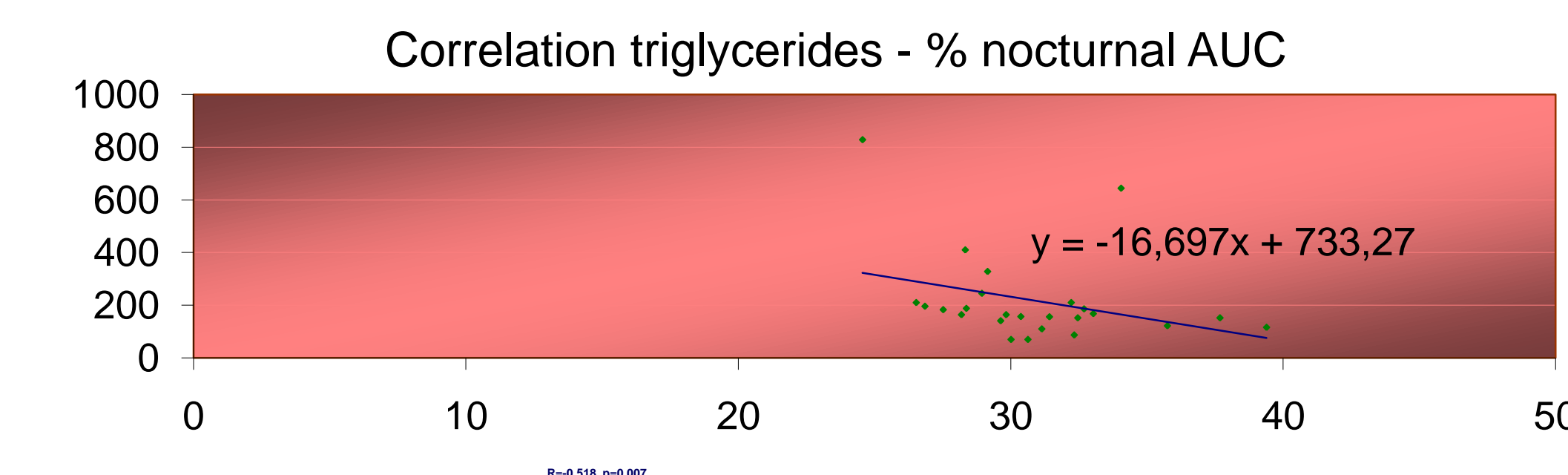
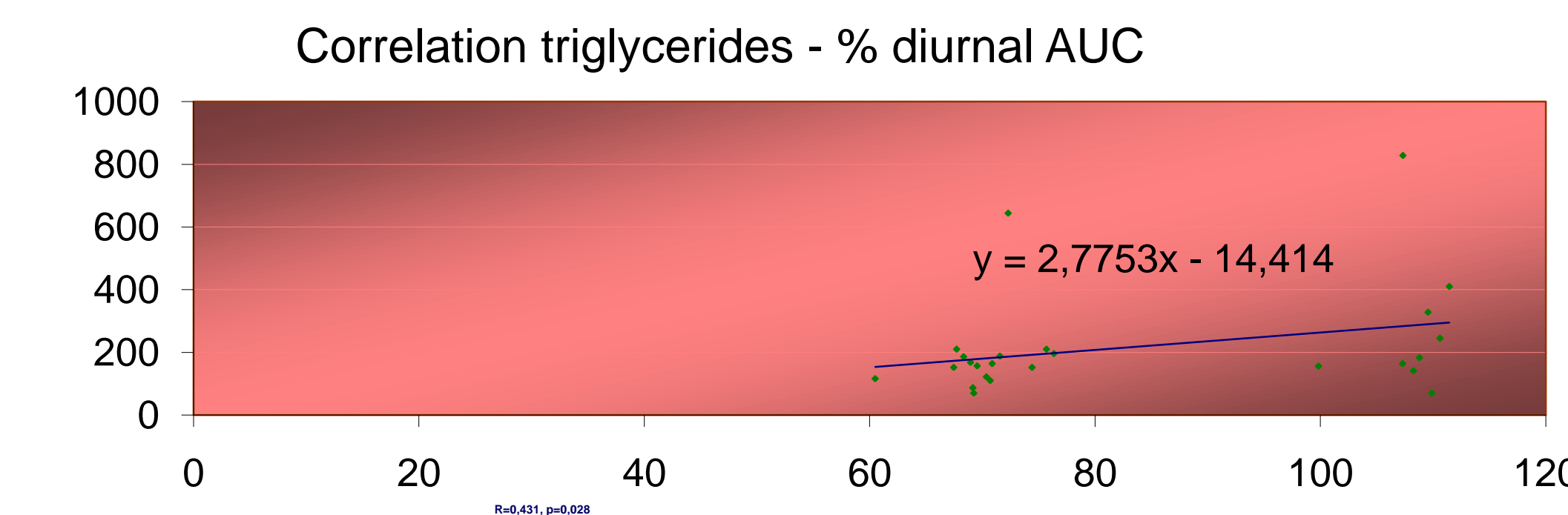
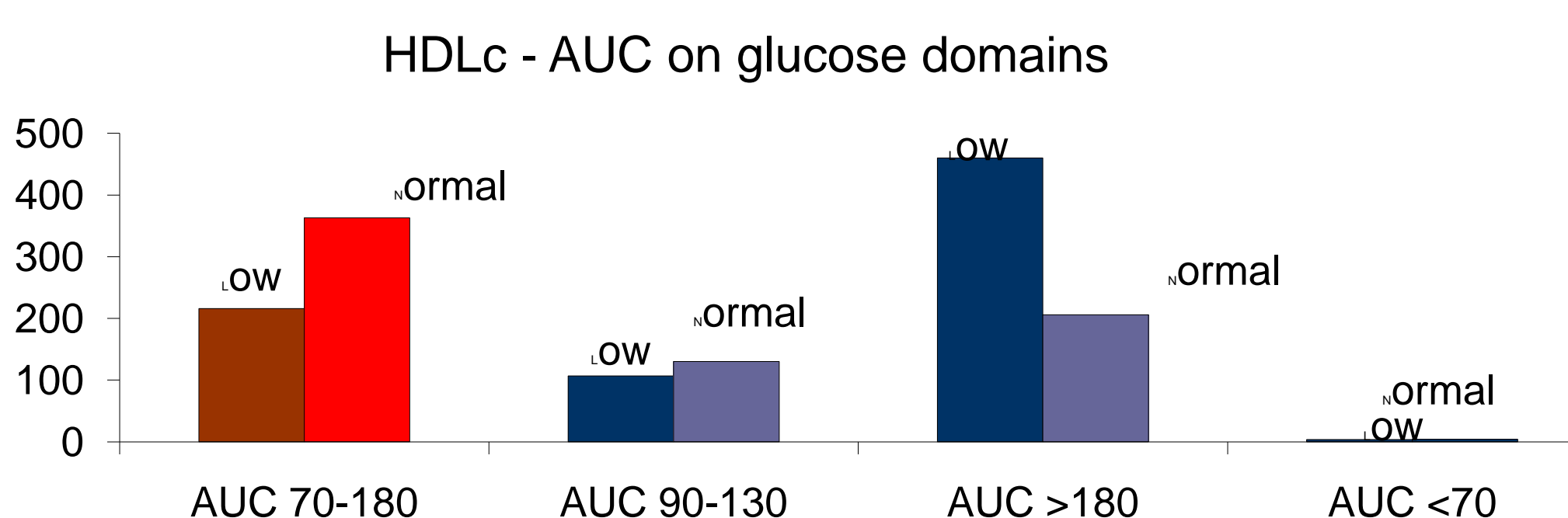
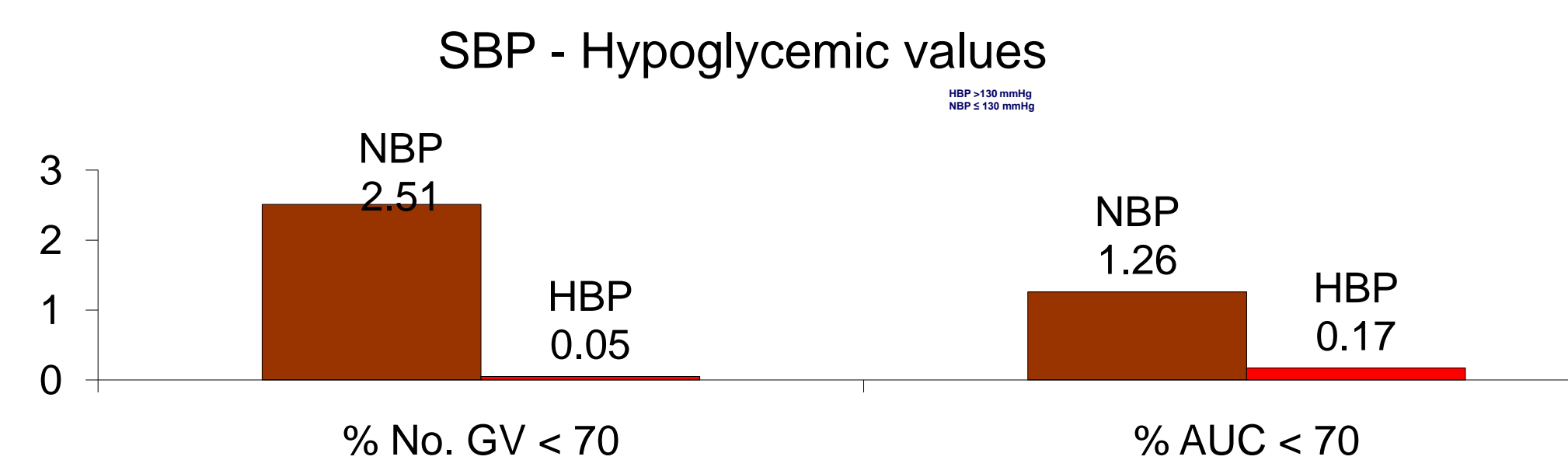
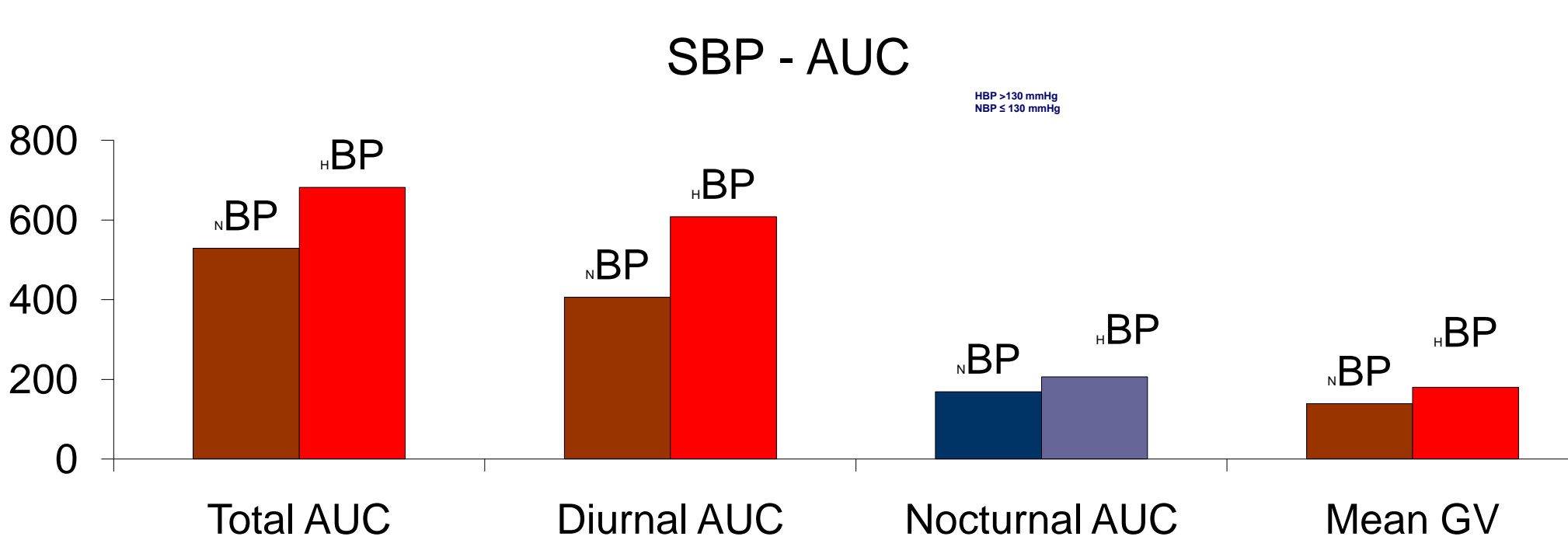
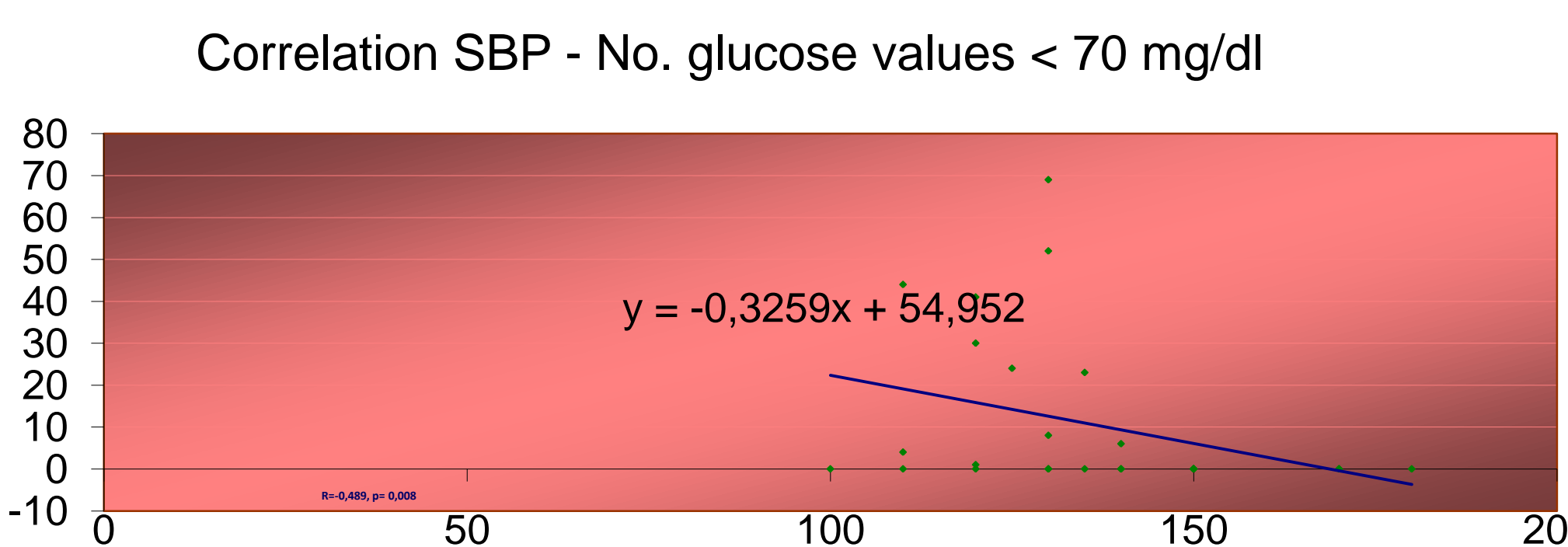
GLUCOSE DOMAINS

(NORMAL, OPTIMAL, HYPO, HYPER)

- Persons with SPB > 130 mmHg had:
 - lower percent NGV and AUC < 70,
 - higher total, diurnal and nocturnal AUC,
 - higher glucose amplitude (MGV).
- LDLc decreased with increasing insulin-therapy duration.

TG values were

- directly correlated with diurnal AUC
- inversely related to nocturnal AUC.
- HDLc was directly correlated with AUC 70-180.



Other assessed data were not significant, even if the direct relation between worse cardiometabolic parameters and hyperglycemic exposure was close to statistical significance.

Conclusions

SBP was directly correlated with total glucose status and inversely related with hypoglycemia.

TG and HDLc were directly correlated with glucose status and worsened with age (HDLc).

Awareness of familial RF induced a better glucose control with a higher exposure to hypoglycemia.