GLYCOREGULATION IN DIABETIC AND NO DIABETIC PATIENTS AND THE IMPACT ON EARLY CLINICAL OUTCOME IN PATIENTS WITH ACUTE CORONARY SYNDROME

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THE SCOPE OF THE PROBLEM

Diabetes mellitus is a major independent risk factor for acute coronary syndrome (ACS). In addition, diabetic patients with ACS suffer from increased mortality compared to their nondiabetic peers. Acute hyperglycemia is common in patients with ACS even in the absence of a history of type 2 DM. Elevated plasma glucose and glycated hemoglobin levels on admission are independent prognosticators of both in-hospital and long-term outcome regardless of diabetic status.

PURPOSE

The aim of our study was to analyse the impact of glycoregulation before and during the hospital treatment in patients with acute coronary syndrome on earlyin-hospital clinical outcome (CE).

METHODS

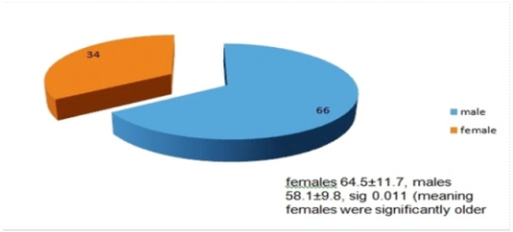
Patients with acute coronary syndrome (ACS) were included in the analysis (STEMI, NSTEMI and APNS), treated with PCI, in whom we analysed: demographic characteristics, risk profile (HTA,DM, smoking, HLP, family history), basic biochemical variables (Hgb, BUN, creatinine, Na, K), lipid profile (Tg, HDL, LDL Hol, lpa), HgbA1C, admitting glucose level and levels of glucose during the hospitalisation, and TIMI flow before and after PCI procedure. We divided patients in diabetics and non-diabetics. Than based on the level of HgbA1C measured at admission we subdivided diabetics in good (<6.5%), and bed controled (>6.5%) DM, and patients without previously known diabetes in three groups: no diabetics (<5.6%), prediabetics (5.6-6.5), and diabetics (>6.5) HgbA1C. Based on glycaemic levels we divided pts. in groups: good regulation (5-10mmol/L), bed regulation: >10mmol/L episodes, and <5mmolL episodes. We analyzed influence of glycoregulation on biochemical variables and lipide profile, PCI results (TIMI flow), and cardiac events (heart failure, shock, dysrhythmias, GIT bleeding, CVI and cardiac death).

Statistical analyse: descriptive and comparative statistics with t-test, Chi square test, uni and multivariate analyse. Significance determined at 0.05.

RESULTS

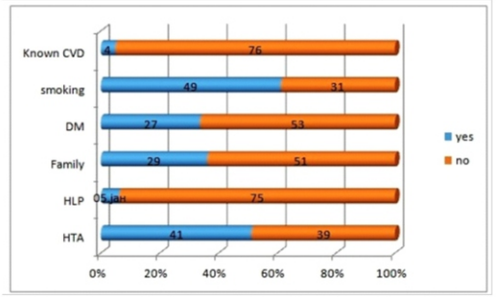
Study population: 80 patients (27 (33.8% f and 53 (66,2%) male) at mean age 60±11y, were included in the analyze. (Graphic 1)

Graphic 1. **Patient distribution by gender and age**



Risk profile: 51% had HTA, 6.3% HLP, 36.3% positive family history, 33.8% were diabetics, 61.4% smokers, 5% previous CAD.

Histogram 1. **Presence of risk factors in the study population**



Mean Hgb 14.6±1.4mg/dl, BUN 5.9±3.2, creatinine 80.5±30.6 micromol/L, Na 137.5±3.4, K 4.2±0.5, Tg 1.7±0.8, HDL 1.1±0.3, LDL 3.4±1.1 i lpa 33.8±27.8. On Table 1 we can see comparative values of biochemical parameters in patients with DM vis a vis nondiabetic patients.

Table 1. **Variable distribution in diabetic vs non diabetic patients**

	DM	N	Mean	SD	Sig (p)
Hgb	No	53	14,84	1,30	,079
	Yes	27	14,27	1,41	
BUN	No	53	5,77	2,00	,491
	Yes	27	6,30	4,86	
creatinin	No	53	80,83	28,27	,922
	Yes	27	80,00	47,48	
Na	No	53	138,25	3,13	,017
	Yes	27	136,30	3,79	
K	No	53	4,24	,518	,728
	Yes	27	4,28	,63	
HgbA1C	No	53	5,67	,90	,000
	Yes	27	7,73	1,83	
Gladmition	No	53	8,03	3,51	,000
	Yes	27	14,57	8,43	
Tg	No	53	1,63	,76	,098
	Yes	27	1,97	1,01	
HDL	No	53	1,14	,29	,814
	Yes	27	1,15	,27	
LDL	No	53	3,45	1,21	,964
	Yes	27	3,44	1,02	
lpa	No	53	32,98	30,10	,698
	Yes	27	35,56	22,95	

Statistical significant difference was found only for sodium and glycemic parameters, glycemia at admission and HgbA1C.
Among 53 nondiabetic patients prior to ACS, we identified 4 (5%) patients with diabetes (HgbA1C >6,5%), and 18 (22.5%) with pre-diabetes (HgbA1C 5.6-6.5%). We divided patients according to the measured values of HgbA1C in five categories:

- group 3 DM patients with goodgycemic control(HgbA1C <6.5%)
- group 4 DM patients with bed gycemic control(>6.5%), and
- group 0 NonDM patients with normal HgbA1c (<5.6%),
- group 1 NonDM patients with prediabetes according to the HgbA1C (5.6-6.5%), and
- group2 NonDM patients with diabetes according to the HgbA1C (>6.5%).

Here are comparative values of glycemic parameters and lipide profile in five subgroups

Table 2. **Variable distribution as a function of HgbA1C**

		N	Mean	SD	sig	Tukey (between groups)	
HgbA1C	0	31	5,20	,61	,000	0 vs. 1..2..3..4	,006; ,000; ,080; ,000
	1	18	5,98	,16		1 vs.2..3..4	,000; ns; ,000; ,000
	2	4	7,88	1,02		2 vs.3..4	,000; ,081
	3	11	5,90	,42		3 vs 4	,000
	4	16	8,99	1,25			
	Total	80	6,36	1,61			
Gladmition	0	31	6,87	1,80	,000	0 vs 1..2..3..4	ns; ,035; ,435; ,000
	1	18	8,47	3,36		1 vs 2..3..4	,224; ,ns; ,000
	2	4	15,0	6,06		2 vs 3..4	ns; ns
	3	11	10,5	3,80		2 vs 4	,011
	4	16	17,3	9,67			
	Total	80	10,2	6,42			
Tg	0	31	1,66	,689	,051	0 vs 1...2..3..4	ns; ns; ns;. 417
	1	18	1,41	,641		1 vs 2..3..4	,526; ns; ,078
	2	4	2,32	1,49		2 vs 3..4	ns; ns
	3	11	1,63	,597		3 vs 4	ns
	4	16	2,20	1,17			
	Total	80	1,74	,865			
HDL	0	31	1,05	,218	,071	0 vs 1..2..3..4	,085; ns; ,732; ns
	1	18	1,27	,359		1 vs 2..3..4	ns; ns; ,836
	2	4	1,22	,298		2 vs 3..4	ns; ns
	3	11	1,22	,210		3 vs 4	ns
	4	16	1,10	,299			
	Total	80	1,14	,284			
LDL	0	31	3,35	1,27	,812	0 vs 1..2..3..4	ns; ns; ns; ns
	1	18	3,53	1,20		1 vs 2..3..4	ns; ns; ns
	2	4	3,90	,663		2 vs 3..4	ns..ns
	3	11	3,22	1,35		3 vs 4	ns
	4	16	3,59	,738			
	Total	80	3,45	1,14			
lpa	0	31	40,8	34,9	,098	0 vs 1..2..3..4	ns; ns; ns; ns
	1	18	20,7	15,8		1 vs 2..3..4	ns; ns; ,345
	2	4	26,7	21,4		2 vs 3..4	ns; ns
	3	11	27,9	15,1		3 vs 4	ns
	4	16	40,8	26,2			
	Total	80	33,85	27,774			

Mean TIMI flow was 0.45±0.79 before, and 2.96±0.19 after PCI, r -.221, p 0.000.
The single independent predictor in multivariate analyse (included HgbA1C, admitting glycaemic level, glycoregulation and diabetic group) on TIMI flow was admitting glycaemia (beta -.327, p 0.003).
12/80 pts. had CE, and again we included same variables and identified two independent predictors of CE: admitting glycaemic level (beta .386, p 0.007) and HgbA1C (beta .254, p 0.070).

CONCLUSION

Acute coronary syndrome identified patients with previously no diagnosed diabetes. Stress glycaemia (admission glycaemic level) was found to be significant predictor of PCI results, and together with HgbA1C level of CE in ACS patients treated with PCI.