POST-STROKE HYPERGLYCEMIA AND GLUCOSE VARIABILITY: THE KEY FACTORS UNDERLYING POOR OUTCOMES IN PATIENTS WITH DIABETES MELLITUS.

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HYPOTHESIS AND OBJETIVES

- Diabetes Mellitus (DM) has been widely associated with poor outcome after an ischemic stroke (IS). However the underlying mechanisms are not well elucidated.
- We aim to study whether the outcome in stroke patients with DM is independent of comorbidity, the development of poststroke hyperglycaemia or due to higher glycaemic variability.

MATERIAL AND METHODS

- Secondary analysis of the GLIAS-II study (multicenter, prospective, observational academic cohort study).
- We compared outcomes (in-hospital complications; mortality; death or dependence (mRS >2); and stroke recurrence at 3 months) in two study groups:
 - patients with prior diagnosis of DM (DM group)
 - patients without DM (non DM group).
- We performed multivariate analysis in order to adjust the effect of DM, glycemic variability, poststroke hyperglycemia and HbA1c severity of stroke (NIHSS) on stroke outcomes by stroke severity (NIHSS).

RESULTS

We included 213 patients. The baseline characteristics were similar between groups. There were no differences in in-hospital complications between DM and non DM groups. There was no difference between groups in death or dependency at 3 months, neither in stroke recurrence. The DM group showed a trend toward mortality not statistically significant.

	DM	No DM	P
Demographic Data			
Age (years), mean (SD)	72.3, (8.72)	70.79, (11.62)	.35
Male %	59.4	60.4	1
History			
Hipertension, N (%)	56 (87.5)	95 (63.8)	<.001
Dyslipemia, N (%)	32 (50)	65 (43.6)	.45
Metabolic Syndrome, N (%)	23 (35.9)	13 (8.7)	<.001
Charlson comorbidity index, median (IQR)	3 (2)	2 (2)	<.001
Index Stroke Data			
NIHSS basal median, (IQR)	5 (8)	5 (6)	.89
Fibrinolysis iv %	34.4	40.3	.45
Laboratory Data			
Admission glycemia (mg/dL), mean (SD)	179 (68.9)	115.2 (31)	<.001
Admission HbA1c %, mmol/mol, mean (SD)	7.29, 56 (1.62)	5.68, 39 (0.5)	<.001
Glycemia >155mg/dL N (%)	52 (81.2)	45 (30.2)	<.001
Glycemic Variability, mean (SD)	36.31 (18.8)	18.47 (8.9)	<.001

After adjusting for stroke severity, DM was not associated with any of the studied outcomes, while glycaemic variability was independently associated with mortality and glycaemia >155mg/dL within 48 hours after stroke with death or dependence and mortality. The ROC curve for mortality and death or dependency showed that NIHSS score on admission together with the presence of glycaemia >155mg/dL and GV in the first 48 hours had higher sensitivity for prediction of poor outcome than stroke severity alone

	Crude OR			Adjusted OR		
	P	OR	95% CI	P	OR	95% CI
Mortality						
NIHSS admission	.009	1.1	1.02 – 1.18	ref	ref	ref
DM	.09	2.4	.8-6.7	.15	2.21	.75-6.59
Glycemia >155mg/dL	.05	2.9	.9-8.7	.04	3.27	1.03-10.36
GV	.06	1.02	.9-1.05	.03	1.03	1-1.06
HbA1c	.22	1.26	.86-1.83	.19	1.29	.87-1.89
Death or dependency						
NIHSS admission	<.001	1.14	1.08 – 1.2	ref	ref	ref
DM	.44	1.29	0.67-2.48	.45	1.32	.64 – 2.7
Glycemia>155mg/dL	.19	1.5	.81-2.78	.04	2.04	1.0 - 4.03
GV	.34	1	.99-1.02	.07	1.02	.99-1.04
HbA1c	.13	1.21	.94-1.55	.08	1.26	.97-1.64

CONCLUSIONS

DM itself was not associated with poor outcome in acute stroke patients admitted to stroke units, being glycaemic variability and poststroke hyperglycemia risk factors for mortality and death or dependence respectively.