GLYCATED HEMOGLOBIN VARIABILITY AND MICROVASCULAR COMPLICATIONS IN PATIENTS WITH TYPE 1 DIABETES MELLITUS

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INTRODUCTION

- Nephropathy, retinopathy, neuropathy are long-term microvascular complications of diabetes.
- Glycated hemoglobin (HbA1c), used as a glycemic control indicator, have proven to be indicative in the development of microvascular complications.

AIM

- In this study, it was aimed to evaluate the contribution of HbA1c variability to the development of complications.

METHOD

- Twenty one cases with type 1 diabetes mellitus (T1DM) who developed microvascular complications and 39 cases without complications, that were similar in terms of age, gender, age of diagnosis, insulin treatment regimen, insulin doses (U / Kg), and mean HbA1c (%) levels were included in the study.
- Student t test and Mann Whitney U methods were used for statistical analysis and ROC analysis were used to determine limit values.

RESULTS

- Mean age of 21 cases (15 girls, 6 boys) who developed microvascular complications was 18.11 ± 4.39 years, and the mean duration of diabetes was 5.87 ± 3.93 years.
- Mean age and duration of diabetes of 39 control patients (24 girls, 15 boys) were 13.25 ± 5.22 and 4.63 ± 3.33 years respectively.
- Nephropathy was detected in 17 cases, neuropathy in 8 cases, and retinopathy in 1 case. Nephropathy occured at a mean age of 11.52 ± 4.12 years; neuropathy at 14.13 ± 5.68 years and retinopathy at 18.41 years.
- Mean age of Type1 DM diagnosis in the complication group was 5.87 ± 3.93 years and 4.63 ± 3.33 years in the control group (p = 0.20).
- Insulin infusion pump therapy (CSII) was initiated 3.12 ± 2.91 years after the diagnosis of diabetes and mean duration of CSII use was 7.45 ± 3.78 years. In the complication group 40% of the patients and in the control group 32.5 % were using CSII.
- The mean HbA1c during follow up was similar in both of the groups (8.60% ± 0.63 vs 8.84% ± 1.32%). Adjusted HbA1c-Standard deviation (SD) and HbA1c-Variation coefficient (CV) values were 1.30 ± 0.65 and 14.36 ± 6.23 in the group with complications, and 0.91 ± 0.37 and 10.59 ± 4.01 in the control group (p <0.05).
- In the ROC-analysis for microvascular complications, the limit value HbA1c-CV value was 11.99%. (sensitivity: 61.9%, specificity: 71.9; Youden index J: 0.3370). This value for HbA1c-SD was 0.9699. (sensitivity: 71.43%, specificity: 66.67; Youden index J: 0.3810)

	Patients with complication n=21	Patients without complication n=39	p	OR (95% CI)	p
Male/female (n)	15/6	24/15	0.44	0,64(0.204-2.012	0,44
Age (yr)	**18.11±4.39**	**13.25±5.22**	**0.001***	**1.224(1.075-1.393)**	**0.002***
Age at diagnosis (yr)	5.87 ± 3.93	4.63 ± 3.33	0.20	1.102(0.950-0.279)	0.20
Duration of DM (yr)	**12.2 ± 4.08**	**8,62 ± 4.19**	**0.002***	**1.224(1.064-1.409)**	**0.005***
CSII/MDT(%)	40/60	32.5/67.5	0.56	1.385(0.455-4.213)	0.56
Number of HbA1c measurements	**26.19±10.98**	**17.87±10.5**	**0.006***		
Mean HbA1c (%)	8.60 ± 0.63	8.84 ± 1.32	0.349	1.320(0.742-2.349)	0.345
HbA1c- SD	**1.30 ± 0.65**	**0.91 ± 0.37**	**0.006***	**4.602(1.37-5.45)**	**0.014***
HbA1c- CV	**14.36 ± 6.23**	**10.59 ± 4.01**	**0.006***	**1.165(1.033-0.313)**	**0.013***

CONCLUSIONS

- This study has shown that long-term fluctuations in HbA1care associated with the development of microvascular complications in type 1 diabetes.
- However, new studies with more patients are needed in this area.

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