

Role of Inflammatory Markers in Elderly Type 2 Diabetic Patients with Mild Cognitive Impairment

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ABSTRACT

Type 2 diabetes (T2DM) is a risk factor for Alzheimer's disease and mild cognitive impairment. The etiology of cognitive impairment in people with T2DM is uncertain but, chronic hyperglycemia, cerebral micro vascular disease, severe hypoglycemia, and increased prevalence of macro vascular disease are implicated

INTRODUCTION

Mild Cognitive Impairment (MCI) represents the intermediate stage between normal ageing and dementia. Patients with MCI have an increased risk of developing dementia, with an estimated annual conversion rate to dementia of 12% [1]. The various causes of MCI include neuro degenerative diseases, such as Alzheimer's disease, cerebrovascular disease, major psychiatric illnesses like depression, and other systemic causes [2]. Type 2 diabetes (T2DM) is a risk factor for Alzheimer's disease and mild cognitive impairment. The aetiology of cognitive impairment in people with T2DM is uncertain, but it is most likely multifactorial. Chronic hyperglycaemia, severe hypoglycaemia, and increased prevalence of macro vascular disease have all been implicated but are unlikely to explain the entire effect [3]. T2DM is associated with atherosclerosis of the cerebral arteries and leads to important cerebral vascular changes that cause a decrease in cerebral blood flow. Furthermore, hyperglycemia is accompanied by an accelerated rate of advanced glycation end product (AGE) formation, which is associated with increased amyloid deposition and oxidative stress which all lead to developing of cognitive impairment [4]. One of the theories is that endothelial activation or inflammatory processes may be involved in the pathogenesis of MCI in diabetes [5].

OBJECTIVE

The aim of the study is to determine the serum levels of soluble vascular adhesion molecule (sVCAM-1) and highly sensitive C- reactive protein (Hs-CRP) in elderly T2DM with mild cognitive impairment (MCI).

RESULTS

Serum levels of sVCAM-1 in diabetic elderly patients with MCI were significantly higher (946.7 ± 162.01 ng/ml) than diabetic elderly patients without cognitive impairment (479.06 ± 65.27 ng/ml) and control (263.7 ± 72.05 ng/ml) with ($P=0.002$). Serum levels of Hs-CRP in diabetic elderly patients with MCI were significantly higher than as diabetic elderly patients without cognitive impairment and control with ($P=0.005$).

	Group I		Group II		Group III		All Diabetic	
	R	P-value	r	P-value	r	P-value	r	P-value
Age (years)	-0.12	0.205	-0.247	0.094	0.198	0.147	-0.215	0.050
Wt (Kg)	-0.164	0.127	-0.063	0.371	0.486	0.003	-0.434	0.000
BMI (Kg/m ²)	0.250*	0.04	-0.049	0.398	0.395*	0.015	-0.387	0.001
SBP (mmHg)	-0.025	0.437	0.000	0.5	-0.009	0.482	0.034	0.399
DBP (mmHg)	0.062	0.353	0.000	0.5	-0.085	0.328	0.000	0.500
Years of education (years)	-0.157	0.142	0.394*	0.016	-0.141	0.229	-0.017	0.448
T.G(mg/dl)	-0.08	0.288	0.165	0.191	0.216	0.125	0.435**	0.000
T.C(mg/dl)	-0.064	0.327	0.187	0.161	-0.121	0.261	0.507**	0.000
HDL(mg/dl)	-0.075	0.3	0.22	0.122	0.006	0.488	-0.094	0.238
LDL(mg/dl)	0.161	0.128	-0.019	0.461	0.251	0.090	0.366**	0.002
FPG (mg/dl)	0.123	0.199	-0.113	0.276	-0.070	0.357	0.195	0.068
2PPPG(mg/dl)	0.329*	0.013	-0.143	0.225	-0.105	0.291	0.242	0.011
HbA1c%	0.519**	0.000	-0.213	0.129	-0.102	0.296	0.494**	0.000
Fe:Cr(mg/dl)	0.466**	0.001	-0.066	0.365	-0.043	0.410	0.369**	0.002
sVCAM-1(ng/ml)	0.725**	0.000	0.525**	0.001	0.094	0.311	0.912**	0.000

**P-value < 0.01 is high statistical significant

*P-value < 0.05 is significant

	Group I		Group II		Group III		All Diabetic	
	R	P-value	R	P-value	R	P-value	R	P-value
Age (years)	-0.017	0.45	-0.258	0.084	0.038	0.421	-0.224	0.043
Wt (Kg)	0.272*	0.019	0.106	0.288	0.169	0.186	-0.554	0.000
BMI (Kg/m ²)	0.256*	0.025	0.316*	0.044	0.157	0.204	-0.467	0.000
SBP (mmHg)	0.095	0.254	0.096	0.306	0.115	0.273	0.090	0.247
DBP (mmHg)	0.127	0.199	0.054	0.388	0.006	0.487	0.048	0.357
Years of education (years)	-0.099	0.23	0.618**	0.000	-0.250	0.091	0.005	0.485
T.G(mg/dl)	-0.018	0.443	-0.03	0.437	0.306	0.050	0.439**	0.000
T.C(mg/dl)	-0.149	0.126	0.199	0.145	-0.008	0.483	0.497**	0.000
HDL(mg/dl)	0.049	0.354	0.360*	0.026	-0.038	0.422	-0.061	0.322
LDL(mg/dl)	0.099	0.221	0.396*	0.015	0.098	0.303	0.319**	0.007
FPG (mg/dl)	0.249*	0.031	-0.091	0.316	0.583	0.130	0.331**	0.005
2PPPG(mg/dl)	0.259*	0.024	-0.279	0.068	0.545	0.115	0.335**	0.004
HbA1c%	0.501**	0.000	0.054	0.389	0.635	0.210	0.614**	0.000
Fe:Cr(mg/dl)	0.293*	0.013	-0.252	0.089	0.490	0.101	0.474**	0.000
HsCRP(ng/ml)	0.728**	0.000	0.528**	0.001	0.094	0.311	0.912**	0.000

**P-value < 0.01 is high statistical significant

*P-value < 0.05 is significant

Correlation between HsCRP and all studied parameters in all groups..

Correlation between sVCAM-1 and all studied parameters in all groups.

CONCLUSION

Elderly diabetic patients with mild cognitive impairment have higher levels of soluble adhesion molecules and markers of low-grade systemic inflammation than other groups.



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