Detection of Subclinical Diabetic Autonomic Neuropathy by Reflex Cardiovascular Testing

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OBJECTIVES

To Study the possibility of the use of non- invasive cardiovascular tests for early detection of subclinical Cardiac autonomic neuropathy in type 2 diabetic patients

Methods

1-This is a cross sectional study that included 40 patients with type 2 diabetes mellitus who attended the Diabetic clinic at Ain Shams University hospitals. Patients participated in this study after signing an informed consent
2-They were (15 males and 25 females) with mean age of 54.8 +8.5 years and mean duration of diabetes of 12 yrs
3 -Detailed medical history: including age ,diabetes duration ,control , medications, Heart disease
4-Clinical examination: including vital signs and anthropometric evaluation
And **Special cardiovascular tests**
Parasympathetic cardiovascular tests
    -Heart rate response to deep breathing (i.e., beat-to-beat heart rate variation ,R-R variation):
    -Heart rate response to standing
Sympathetic cardiovascular tests as
    -Blood pressure response to standing

Table (1): Overall results of the three tests.

	Number (%)
None	9 (22.5%)
1 test +ve	20 (50%)
2 tests +ve	10 (25%)
3 tests +ve	1 (2.5%)

Table (2): Heart rate response to deep breathing test.

	Number (%)
Normal	7 (17.5%)
Borderline	5 (12.5%)
Abnormal	28 (70%)

Table (3): Heart rate response to standing test.

	Number (%)
Normal	22 (55%)
Borderline	8 (20%)
Abnormal	10 (25%)

Table (4): Blood pressure response to standing test.

	Number (%)
Normal	32 (80%)
Borderline	3 (7.5%)
Abnormal	5 (12.5%)

Table (5): Relation between Number of abnormal reflex cardiovascular tests and diabetes control

Number of tests abnormality		DM_control		p-value
		Good control	Poor control	
No abnormality	No.	4	5	
	%	40.0%	16.7%	
1 test is abnormal	No.	5	15	<0.05
	%	50.0%	50.0%	
>=2 tests are abnormal	No.	1	10	
	%	10.0%	33.3%	

Table (6): Relation between Number of abnormal reflex cardiovascular tests and age.

Number of tests abnormality		Age		p-value
		30-50 ys	50-70 ys	
No abnormality	No.	7	2	
	%	50.0%	7.7%	
1 test is abnormal	No.	7	13	<0.001
	%	50.0%	50.0%	
>=2 tests are abnormal	No.	0	11	
	%	.0%	42.3%	

Table (7): Relation between Number of abnormal reflex cardiovascular tests and diabetes duration.

Number of tests abnormality		Duration			p-value
		<5 ys	5-20 ys	>20 ys	
No abnormality	No.	7	2	0	
	%	70.0%	10.0%	.0%	
1 test is abnormal	No.	3	14	3	<0.001
	%	30.0%	70.0%	30.0%	
>=2 tests are abnormal	No.	0	4	7	
	%	.0%	20.0%	70.0%	

Table (8): Relation between Number of abnormal reflex cardiovascular tests and body mass index.

Number of tests abnormality		Body mass index			p-value
		Normal	Overweight	Obese	
No abnormality	No.	5	2	2	
	%	41.7%	22.2%	10.5%	
1 test is abnormal	No.	4	6	10	<0.05
	%	33.3%	66.7%	52.6%	
>=2 tests are abnormal	No.	3	1	7	
	%	25.0%	11.1%	36.8%	

Conclusion:

Reflex cardiovascular tests can be used for the early screening of cardiovascular autonomic neuropathy before more sophisticated and specific tests
Cardiovascular tests were affected by age, body mass index(BMI), glucose control and diabetes duration

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