

Original Article

POSTURAL HYPOTENSION IN MALE DIABETICS WITH AUTONOMIC CARDIOVASCULAR DYSFUNCTION AND IMPOTENCE

Sajid Nisar, Tahir Bashir and Faisal Masud

Objective: To find out frequency of postural hypotension in male diabetics with autonomic cardiovascular dysfunction and impotence.

Material & Methods: A total of 200 male diabetic patients, attending Diabetes Management Centre Services Hospital Lahore, were enrolled in the study. All the diabetic patients between ages 14-60 years, having fasting blood sugar level more than 126 mg/dl, were included. A detailed history was taken and all patients underwent relevant physical examination; blood pressure was taken in supine and standing position and investigations like random blood sugar levels were checked. The diagnosis of autonomic cardiovascular dysfunction was documented by heart rate response to valsalva maneuver. The ratio of longest R-R to shortest R-R is < 1.2 during valsalva in patients with autonomic cardiovascular dysfunction. The postural hypotension in diabetic patients was calculated after recording the postural drop in all the patients. Before assessing blood pressure variation with postural change, 20 min supine rest was mandatory.

Results: The age range was from 14-60 years. The percentage of patients with postural drop was 32 percent in the presence of parasympathetic dysfunction. The mean age of patients with parasympathetic dysfunction was 50.65 ± 5.53 years.

Conclusion: Postural hypotension does not seem to be a good marker for autonomic neuropathy. The proportion of patients having postural hypotension in the presence of parasympathetic dysfunction was not significant in the study population. However significant correlation of postural hypotension with duration of diabetes was found.

Keywords: Diabetes mellitus, Postural hypotension and Autonomic dysfunction.

Introduction

Diabetes mellitus is a syndrome with disordered metabolism and inappropriate hyperglycemia due to either a deficiency of insulin secretion or combination of insulin resistance and inadequate secretion to compensate.¹ Diabetes is a leading cause of morbidity & mortality worldwide, and is sixth leading cause of death in United States accounting for more than 71,000 deaths a year.²

The diabetic patient is susceptible to series of complications that cause morbidity and premature mortality.⁶ The long standing hyperglycemia promotes the reaction of glucose with components of the arterial wall to form advanced glycation end products. These products cross-link with collagen, thereby increasing arterial stiffness which in the presence of increased levels of low-density lipoprotein (LDL) and cholesterol promotes atherogenesis. In this way high blood glucose levels lead to endothelial damage, manifesting as micro-vascular or macro-vascular damage.⁴ In case of affection of vegetative nerves (non-myelinated C fibres), autonomic neuropathy occurs. It is a

relatively frequent form of neuropathy which remains for longer period of time without clinical symptoms and therefore is rarely diagnosed and treated. The presence of this complication is recognized by tachycardia at rest, deterioration of gastric evacuation, diabetic diarrhea or constipation and erectile dysfunction, impaired function of sweat glands or impaired papillary reaction. The advanced form involves the danger of latent myocardial ischemia, serious postural hypotension and sudden death. It increases significantly the mortality of the affected patients.⁵ Diabetic complications impose a heavy burden on health services because poor glycaemic control in patients with diabetes also has been correlated directly with increased overall health care costs.^{7,8}

A wide range of clinical consequences of cardiovascular autonomic neuropathy can be observed in diabetic patients which contribute to the clinical picture of the diabetic heart. Resting heart rate and cardiovascular reflexes as well as circadian heart rate variability may be altered by cardiovascular autonomic neuropathy in diabetes. Moreover, blood

pressure is also influenced by sympathovagal imbalance. Impairment of cardiac parasympathetic and sympathetic innervation may play a partial role in the pathogenic mechanism of sudden death in diabetic patients.¹¹ The diagnosis of diabetic autonomic neuropathy is mainly based on the analysis of cardiovascular challenge maneuvers.¹⁰ Cardiovascular reflexes like valsalva test is useful to give an objective assessment of the state of autonomic nervous system in diabetics.¹² The prevalence of erectile or sexual dysfunction is about 50% in men with diabetes and about 30% in women, but limitations in assessing female sexual dysfunction may be the reason for the apparent sex-related difference. Erectile dysfunction may be the presenting symptom of diabetes and more than 50% of men with diabetes notice the onset of erectile dysfunction within 10 years of onset of the diabetes.¹³ Erectile dysfunction is significantly related to glycemic control (HbA1C) and other features of peripheral neuropathy during first five years of clinically known duration of diabetes.¹⁴ Orthostatic hypotension is the most disabling feature of autonomic dysfunction. A fall of more than 20 mmHg in systolic blood pressure from supine to standing seems to be the reliable criterion for the assessment of orthostatic hypotension in the diagnosis of autonomic neuropathy.¹⁶

Material & Methods

A total of 200 diabetic patients with parasympathetic dysfunction, attending Diabetes Management Centre Services Hospital Lahore, were enrolled in the study depending upon the inclusion and exclusion criteria. All male diabetic patients between ages 16-60 years were included. These patients were explained in detail about the procedure, risks and benefits of the study and informed consent was obtained. Detailed history was taken. Specific question regarding year of initial diagnosis of diabetes mellitus was asked and then duration of diabetes mellitus was calculated in years. The patients were asked particularly about the symptoms of peripheral vascular disease like Raynaud's phenomenon in which patient feels pain, burning and numbness of fingers or toes that is usually precipitated by cold and relieved by heat and history of any psychiatric illness and use of psychotropic drugs. For impotence, the patients were evaluated with a symptom questionnaire based on the Michigan Neuropathy Screening instrument questionnaire in which the patients were inquired about loss of spontaneous

early morning erections and erection not sufficient to perform intercourse. Then, patients underwent relevant physical examination; resting blood pressure was taken and investigations like random blood sugar levels were checked. The diagnosis of autonomic cardiovascular dysfunction was documented by heart rate response to valsalva maneuver. During this maneuver, the subject forcibly exhales into the mouthpiece of a manometer to 40 mmHg for 15 seconds during ECG monitoring. Healthy subjects develop tachycardia and peripheral vasoconstriction during strain and an overshoot bradycardia and rise in blood pressure with release. But in patients with autonomic cardiovascular dysfunction, overshoot bradycardia with release of pressure in valsalva maneuver is lost and this heart rate variability is measured by R-R interval variation in ECG. The ratio of longest R-R to shortest R-R is < 1.2 during valsalva in patients with autonomic cardiovascular dysfunction. The postural hypotension in diabetic patients was calculated after recording the postural drop in all the patients. Before assessing blood pressure variation with postural change 20 min supine rest was mandatory and diagnosis of postural hypotension was established when a postural decrease from supine to standing position was at least 20 mmHg in systolic and 10 mmHg diastolic pressure after standing for at least 3 minutes.

Results

The age range was 14-60 years. The postural hypotension (sympathetic dysfunction) was observed in 64 (32%) patients (**Fig 1**) while 136 (68%) patients did not show significant postural drop (**Fig 1**).

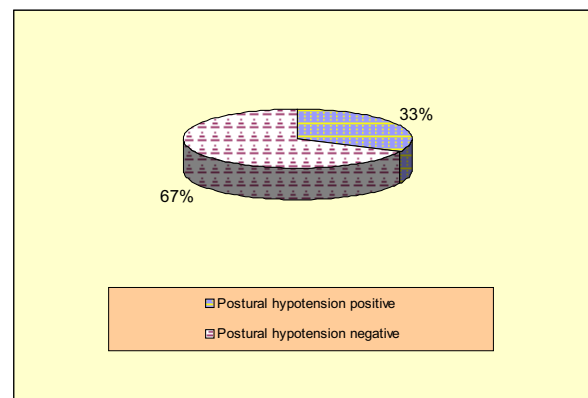


Fig-1: Postural hypotension (sympathetic dysfunction) in patients with parasympathetic dysfunction due to diabetes mellitus

Discussion

our part of the world.¹⁸ Being a chronic disorder, much of its morbidity and mortality is related to the presence of associated long term complications.¹⁹ Autonomic neuropathy is a recognized microvascular complication of the disease and its frequency increases with age, duration of diabetes and poor glycaemic control.²⁰ Presence of autonomic neuropathy clearly correlates with an increased risk of mortality in diabetics.²¹ Although treated as single entity, sympathetic & parasympathetic dysfunctions are two distinct and separate components of diabetic autonomic neuropathy. Postural drop in blood pressure represents the sympathetic limb and parasympathetic dysfunction manifests as impotence and more specifically with loss of normal heart rate variability. It is this loss of R-R variation that correlates more strongly with mortality associated with autonomic neuropathy.²¹

Owing probably, to ease of method, cardiovascular autonomic neuropathy is clinically assessed by documentation of postural hypotension. However, there is no evidence to date that postural hypotension is actually representative of parasympathetic dysfunction in diabetes mellitus. So far, very little work has been done to compare the progression of sympathetic and parasympathetic components of diabetic autonomic neuropathy.

In fact, the few studies that have been carried out in this regard suggest that parasympathetic dysfunction appears earlier in the course of the disease, while postural hypotension or sympathetic

neuropathy occurring as a late event.²²

In our study, we tried to assess the frequency of sympathetic dysfunction in the local diabetic population, having features of parasympathetic autonomic neuropathy. Two hundred patients with symptoms of impotence and loss of heart rate variability were assessed for postural drop. Only 32% subjects showed a significant drop, while the majority (68%) had no evidence of sympathetic dysfunction despite having definite parasympathetic autonomic neuropathy (**Fig 1**). This clearly shows that postural hypotension does not apparently correlate with impotence and loss of heart rate variability.

In the light of our results, it is probably safe to assume that postural hypotension is not an early marker of autonomic dysfunction in diabetics.

Conclusion

This study was designed to find out the sympathetic integrity in all diabetic patients with parasympathetic dysfunction. Sympathetic dysfunction is the gravest among autonomic complications of diabetes and this study focuses on finding the frequency of postural hypotension due to sympathetic neuropathy in diabetic patients.

*Department of Medicine
Services Institute of Medical Sciences, Lahore*
theesculapio@hotmail.com

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CORRIGENDUM

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In an original article, “**Maternal Education and Impact on Child Health Care Practice in Mota Common 5 Admission in Pediatric Medicine**” by Iftikhar Ijaz, Afsheen Batool Raza, Farah Naz, Taheed Ahmed Butt and Tahseen Fatima”

Department of Pediatrics & Pediatric Nephrologists.

The Children's Hospital & the Institute of Child Health, Lahore, Pakistan

was printed in a heading mistake which is underline below

Materials and Methods

- 1) To determine the frequency of top five diseases among children admitted in paediatric medical unit.
- 2) To find out the association of maternal education with immunization status and nutritional status in children with these diseases.

The Correct heading is

Aims and Objectives

- 1) To determine the frequency of top five diseases among children admitted in paediatric medical unit.
- 2) To find out the association of maternal education with immunization status and nutritional status in children with these diseases.