

Research Article

A study on autonomic neuropathy scorings in patients of chronic renal failure with and without symptoms

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Abstract

Abstract: Introduction: Chronic renal failure may be asymptomatic or symptomatic. Autonomic neuropathy is commonly associated with chronic renal failure. In recent years, there has been a growing interest in the cardiovascular autonomic neuropathy in chronic renal failure because of its association with an increase in mortality in these patients. So the study of autonomic neuropathy in patients of chronic renal failure with and without symptoms was taken up.

Methods: The following clinical tests for autonomic neuropathy were done in 100 patients. Heart rate variability in response to deep breathing, heart rate variability in response to standing heart rate in response to valsalva maneuver, blood pressure response to standing and BP response to sustained hand grip exercise were recorded. Values obtained from the various tests were tabulated into a worksheet and a scoring system was applied to each test as recommended by Bellavere *et al.* The degree of autonomic neuropathy was assessed using CAN score. Mean CAN scores were compared in patients with and without symptoms using ANOVA test. P value<0.01 was considered to be statistically significant.

Result: We found out that autonomic neuropathy scorings is significantly higher in symptomatic chronic renal failure patients.

Conclusion: So study of autonomic neuropathy can guide clinicians to prevent early complications in chronic renal failure patients.

Keywords: Autonomic neuropathy; CAN score; chronic renal failure; symptoms

1. Introduction

Chronic renal failure is a syndrome which results from progressive and irreversible destruction of nephrons, regardless of the etiology, where the kidney is no longer able to maintain the biochemical homeostasis. The syndrome is complex and the biochemical changes and clinical signs are variable and mostly non-specific.

Chronic renal failure may be asymptomatic or symptomatic. Autonomic neuropathy is commonly associated with chronic renal failure. Clinical symptoms of autonomic neuropathy, such as gustatory sweating, and those related to enteropathy, cystopathy and orthostatic hypotension are rare. On the other hand asymptomatic abnormalities are not uncommon after 10-15 years' duration of chronic kidney disease.¹ Clinically, the impairment in autonomic function causes exercise intolerance and orthostatic hypotension.²

In recent years, there has been a growing interest in the cardiovascular autonomic neuropathy in chronic renal failure because of its association with an increase in mortality in these patients. So the study of autonomic neuropathy in patients of chronic renal failure with and without symptoms was taken up.

2. Materials and Methods

A prospective study was done in KMC associated hospitals from June 2010 to February 2011 on clinical profiles of autonomic neuropathy in patients of chronic renal failure were taken up.

Inclusion criteria: All patients of 15-60 years meeting the criteria of chronic renal failure as defined by National Kidney Foundation³.

Exclusion criteria: Patients who are on drugs those affect autonomic nervous system like beta blockers, catecholamine etc., patients having neurological diseases that affect autonomic system like cerebrovascular accidents etc., patients who have severe illness of other systems e.g. CCF, respiratory failure and the patients who are moribund and cannot perform valsalva manoeuvre. 100 patients meeting the inclusion criteria were evaluated in detail. The evaluation comprised of detailed clinical history, a thorough clinical examination, lab investigations and the following clinical tests for autonomic neuropathy were done. Heart rate variability in response to deep breathing, heart rate variability in response to standing heart rate in response to valsalva maneuver, blood pressure response to standing and BP response to sustained hand grip exercise were recorded

2.1. Statistical methods

Values obtained from the various tests were tabulated into a worksheet and a scoring system was applied to each test as recommended by Bellavere *et al.*^{4,5} The degree of autonomic neuropathy as assessed using CAN score. Mean CAN scores were compared in patients with and without symptoms using ANOVA test. P value<0.01 was considered to be statistically significant

3. Results

Table I: CVS symptoms Vs mean individual CAN scores:

Variable	With symptoms	Without symptoms	P value
Heart rate variability (beat/min)	1.225	0.433	0.001
Valsalva ratio	0.900	0.317	0.001
30:15 ratio	0.375	0.100	0.026
Postural drop of BP	0.450	0.117	0.004
Rise in Diastolic BP	0.800	0.200	0.001

Table II: Urology symptoms Vs mean individual CAN scores:

Variable	With symptoms	Without symptoms	P value
Heart rate variability (beat/min)	1.316	0.617	0.001
Valsalva ratio	1.211	0.395	0.001
30:15 ratio	0.684	0.099	0.001
Postural drop of BP	0.526	0.185	0.019
Rise in Diastolic BP	0.895	0.333	0.002

Table III : GIT symptoms Vs mean individual CAN scores:

Variable	With symptoms	Without symptoms	P value
Heart rate variability (beat/min)	1.05	0.317	0.001
Valsalva ratio	0.8	0.195	0.001
30:15 ratio	0.325	0.059	0.001
Postural drop of BP	0.35	0.285	0.15
Rise in Diastolic BP	0.65	0.333	0.12

Out of the various parameters of the CAN score in patients with history of CVS symptoms all the parameters were highly significant compared with patients without symptoms as shown in table I. When the individual variants of CAN scores were analyzed in patients with history of urological dysfunction, all were highly significant in comparison with patients without symptoms as shown in table II. When all the parameters of CAN scores were analyzed in patients with gastrointestinal symptoms all were highly significant when compared to patients without symptoms except for postural drop of BP and 30:15 ratio as shown in table III.

4. Discussion

In our study, we found that in patients with cardiovascular symptoms mean CAN scores were statistically significant compared with the patients without symptoms. Kerch *et al* in their study found heart rate variability as the most sensitive parameter while Sanya *et al* found all parameters of the CAN scores equally significant.^{6,7}

In patients with urological symptoms, mean CAN scores of individual parameters were statistically significant compared with patients without symptoms. Calvo *et al* in their study found the prevalence of urological symptoms in 42% of the study subjects and the mean CAN score was 3.561.⁸ Sanya *et al* found a mean CAN score of 3.981 in their study.⁹ In both these studies all the individual parameters of the CAN score were of high significance like our study.

On analysis of gastrointestinal symptoms in our patients, all the parameters except 30:15 score and postural hypotension were highly significant compared with patients without symptoms. Vita *et al* in their study found a mean CAN score of 3.671 in patients with gastrointestinal symptoms. They also found that valsalva ratio was the most sensitive parameter in the entire battery of tests.⁹ Nallamaci *et al* in their study found all parameters equally significant¹⁰. Autonomic neuropathy is well associated with clinical symptoms in chronic renal failure patients. So study of autonomic neuropathy can guide clinicians to prevent early complications in chronic renal failure patients.

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