ABSTRACT

**Background**: By the year 2020 about 250 million people will be affected from diabetes; most of them will have type 2 diabetes mellitus. The most frequently occurring complication in type 2 diabetes is diabetic peripheral neuropathy (DPN) or distal symmetrical polyneuropathy (DSP). DPN affects up to 50-70% of the population with diabetes. DPN still remains the most debilitating cause for morbidity and mortality in type 2 diabetes population.

**Objective**: To evaluate the effect of eight week moderate intensity aerobic (HRR 40-60%) exercise training on Nerve Conduction Velocity (NCV), Neuropathy Quality of Life (NQOL) and Glycosylated Hemoglobin (HbA1c) levels in diabetic peripheral neuropathy.

**Methods**: Study design was a parallel-group, randomized controlled trial carried out in a tertiary setting (Kasturba Hospital) Manipal, Karnataka, India. Patients with type 2 diabetes were included in the study if they had clinical neuropathy which was defined by a minimum score of 7 on the Michigan Diabetic Neuropathy Score (MDNS). Following which the patients were randomly assigned by computer generated random number tables to study or control groups respectively. Repeated Measures Analysis of Variance (RANOVA) was used to analyze pre-post changes in the control and study group and a p value less than 0.05 was considered significant.

The study is registered with Trial registry: CTRI/2011/07/001884.

**Results**: 87 patients with DPN were evaluated in the study. There were 45 patients in the control group and 42 patients in the study group after randomization. On comparison of two groups using RANOVA, biochemical parameters showed a significant difference in two groups for glycosylated hemoglobin (HbA1c) levels (Degrees of freedom (Df1, Df2) 1, 60, F = 8.78 and a p
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< 0.001). For nerve conduction velocity of ankle segment of peroneal nerve there was a significant difference between two groups ((Df1, Df2) 1, 62, F = 5.14 and a p < 0.05). Sural sensory nerve on comparison showed a significant difference for conduction velocity ((Df1, Df2) 1, 60, F = 10.16, and a p < 0.001). A significant difference (p < 0.05) for mean scores of MDNS and NQOL were also observed in the study group by the end of the study duration.

Conclusion: A significant difference for nerve conduction velocity (p < 0.05), NQOL (p < 0.001) and glycosylated hemoglobin (p < 0.05) was observed for the patients in the study group. In the present study there were novel benefits with moderate intensity exercise, hence we conclude that exercise along with standard care is the most prudent way to halt or disrupt the natural progression of DPN.