of 60 seconds of submersion of the limb. Submersion of the limb in ice cold water increases systolic blood pressure by about 10-20 mm of Hg and diastolic blood pressure by about 10 mm of Hg.

II. Hand Grip Test: In the hand grip test, there is a rise in heart rate and blood pressure. The blood pressure rise is due to increased sympathetic activity and heart rate rise is due to decreased parasympathetic activity. Subject was made to lie down in semi recumbent position.
ECG electrodes were connected for lead II recording of ECG and sphygmomanometer for blood pressure measurement. Basal heart rate and blood pressure were recorded. Subject was asked to maintain a pressure of 30% of the maximum activity in the hand grip dynamometer for about 5 minutes. Heart rate and change in SBP, DBP were recorded.

III. Blood pressure response to standing: Patient is again allowed to assume a supine position, and a recording of blood pressure is done in the supine position. Patient is then asked to stand up and blood pressure is recorded at 0 and 1 minute intervals.

The Autonomic function tests which were performed to assess the cardiovascular parasympathetic functional status:
I. Deep breathing test - This test is used to assess the parasympathetic activity. Subject was instructed to maintain deep breathing at a rate of six breaths per minute and was made to lie down comfortably in supine position with head elevated to 30^0. ECG electrodes were connected for recording Lead II ECG. While subject was breathing deeply at a rate of 6 breaths per minute (allowing 5 seconds each for inspiration and expiration) maximum and minimum heart rates were recorded with each respiratory cycle. Expiration to inspiration ratio was determined by using the formula.

II. Valsalva Maneuver - The valsalva ratio is a measure of parasympathetic and sympathetic functions. Subject was made to lie down in a semi recumbent or sitting position. Nostrils were closed manually. Mouth piece was put into the mouth of the subject and the Mercury manometer was connected to the mouth piece. ECG machine was switched on for continuous recording. Subject was asked to exhale forcefully into the mercury manometer and asked to maintain the expiratory pressure at 40 mm of Hg for 10 – 15 seconds. ECG changes were recorded throughout the procedure, 30 seconds before and after the procedure. Valsalva ratio were calculated by using the formula.

III. Heart rate response to standing: On changing the posture from supine to standing heart rate increases immediately by 10-20 beats per minute. This response is detected by recording ECG in supine and standing postures. Subject was made to lie down in supine posture. ECG electrodes were connected from the subject to the cardiowin system. Subject was asked to relax completely for a minimum period of 10 minutes. Basal heart rate was recorded by using cardiowin system. Subject was asked to stand up immediately and change in heart rate is noted from the monitoring screen of cardiowin. Heart rate response to standing was determined by using the formula heart rate in standing position – heart rate in supine position.

3. Results

Results were analyzed by ANOVA with SPSS version 17.0 using an unpaired‘t’ test. The results of the above tests were compared between the test group (type II diabetes mellitus) and healthy age matched controls.

Table 1: Statistical analysis of Parasympathetic function tests in Test and Controls

Variables	*Controls*	*Diabetics*	*P value*
Heart rate response to standing 30:15 Ratio	1.36 ± 0.19	1.17 ± 0.12	<0.01**
Valsalva ratio	1.62 ± 0.26	1.32 ± 0.22	<0.01**
Heart rate response to deep breathing	14.8 ± 7.5	10.2 ± 4.3	<0.05*

In our study 50 subjects of type 2 diabetes patients who were selected after using proper exclusion criteria.

Table -1 :- Heart rate response to standing 30:15 Ratio values were decreased in diabetics as compared to controls Valsalva ratio was decreased in diabetics as compared to controls Deep Breathing test i.e., E/I ratio in diabetics decreased in diabetics as compared to controls. All these Parasympathetic autonomic function tests shows significant P values.

Table 2:- All the sympathetic autonomic function tests like Blood pressure response to standing, Cold pressor test and Hand grip test shows decreased values in diabetics when compared to controls.

When compared all the autonomic function tests, it was proved that heart rate response to deep breathing was the most sensitive test to determine autonomic neuropathy. It is abnormal in 38 patients when compared with controls and normal in 12 patients. This was followed by abnormal heart rate response to standing (30.15 ratio), which was abnormal in 31 patients and normal response were found in 19 patients.

Valsalva ratio was abnormal in 31 patients and normal in 19 cases. Abnormal hand grip test seen in 24 patients and normal response were found in 26 cases. The least sensitive tests to detect autonomic neuropathy was Blood pressure response to standing and cold pressor test which were abnormal in 12 patients and normal in 38 cases. These results showed that Parasympathetic neuropathy i.e., abnormal parasympathetic function was seen in 38 cases while sympathetic neuropathy i.e., abnormal sympathetic function was detected in 24 cases

Table 2: Statistical analysis of sympathetic function tests in Test and Controls

Variables	*Controls*	*Diabetics*	*P value*
Isometric Handgrip SBP	19.55 ± 0.86	14.85 ± 1.20	<0.01**
Isometric Handgrip DBP	15.9 ± 0.83	11.5 ± 0.96	<0.01**
Cold Pressor Test SBP	12.2 ± 1.6	8.2 ± 1.4	<0.05
Cold Pressor Test DBP	13.1 ± 1.8	9.1 ± 1.4	<0.05
Bp Response to standing SBP change	-2.9 ± 0.41	-7.0 ± 1.22	<0.01**
Bp Response to standing DBP change	-2.20±0.43	-5.43±0.66	<0.01**

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