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Assessing the impact of supervised interval training on cardiovascular autonomic status in type 2 diabetes patients

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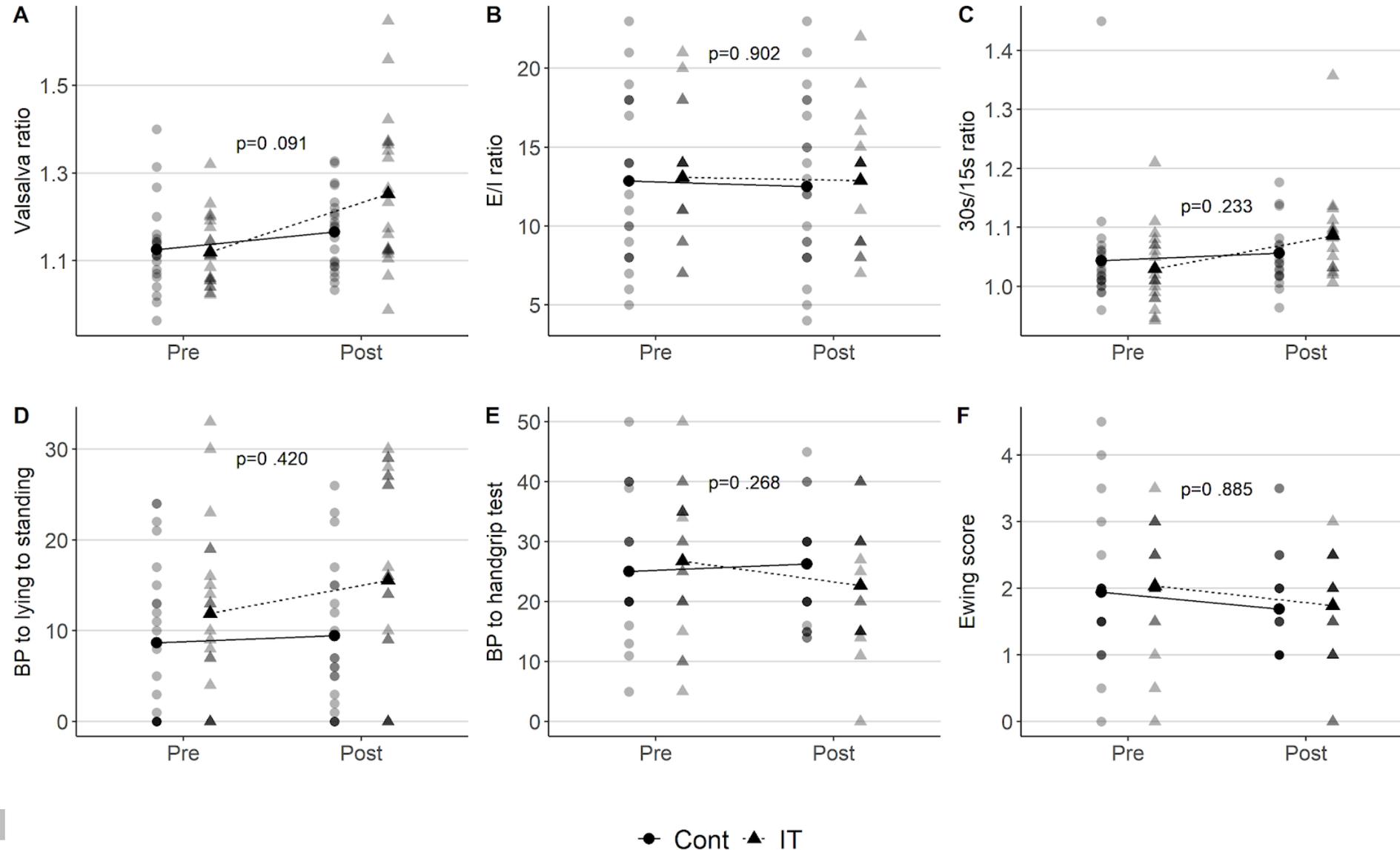
Aim and methods

- Cardiac autonomic neuropathy (CAN) is a serious complication of diabetes mellitus. The significance of CAN has not been fully appreciated. Treatment of CAN includes physical activity. Aim of the study was to detect CAN status and measure the influence of physical activity on the autonomic nervous system using tilt table.
- The study included 51 patients with type 2 diabetes: Control (Cont) and Interval training (IT) group
 - IT group exercised 3 times a week for 60 minutes for 4 months, using a mobile device application
- Cardiovascular autonomic reflex tests (Ewing et al. 1985)
 - Parasympathetic function: heart rate (HR) response to the Valsalva manoeuvre (Valsalva ratio), HR response to deep breathing (E/I ratio) and HR response to standing (30 s/15 s ratio).
 - Sympathetic function: blood pressure (BP) response to lying & standing, BP response to a sustained handgrip.
 - Each test was assessed with a score: 0 - normal, 0.5 - borderline, 1 – abnormal.
 - Ewing score ≥ 2 were classified as CAN positive.

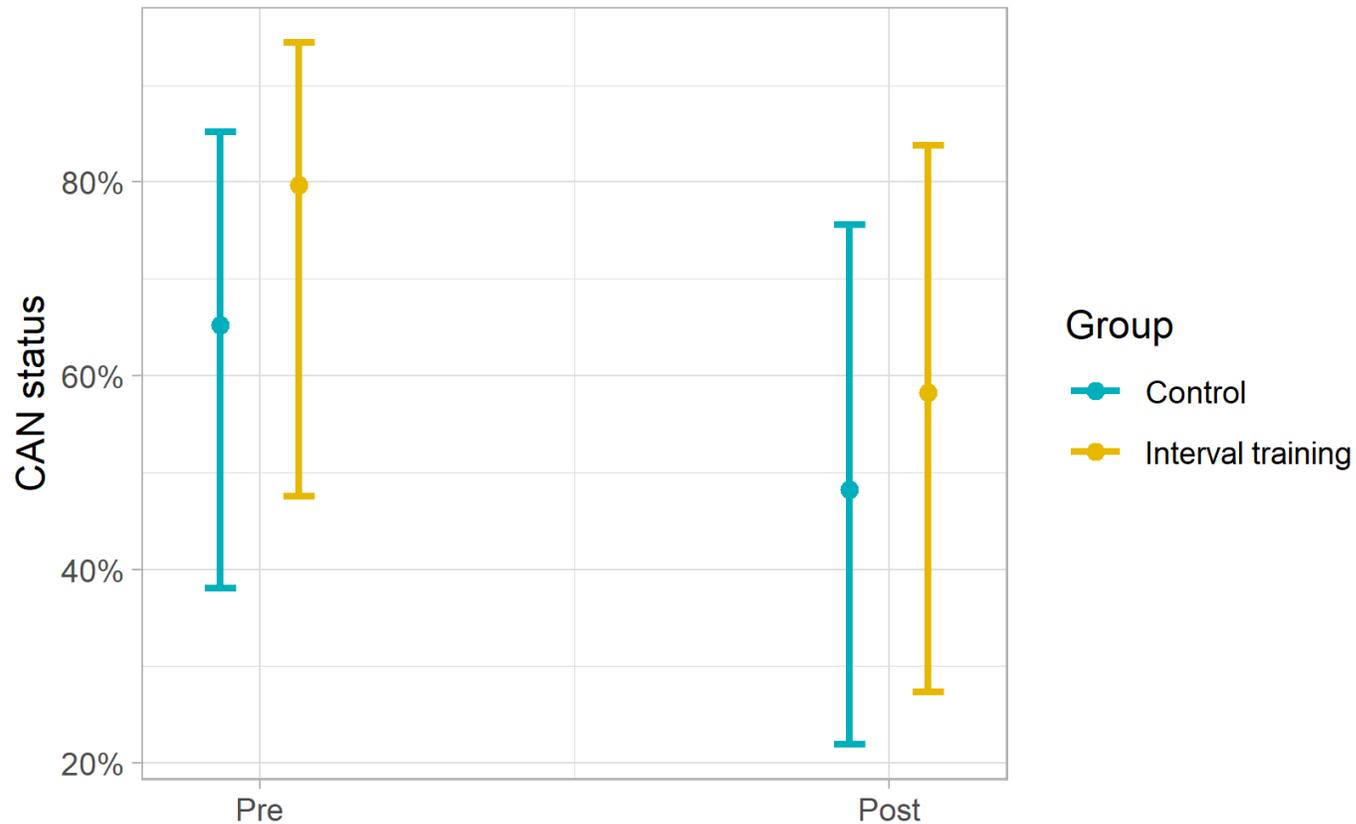
Clinical characteristics before intervention

Variable	Control group (n=30)	Interval training group (n=21)	p value
Age (years)	59.20±9.87	58.71±10.58	0.813
Body mass index (kg/m ²)	33.37±6	33.10±4.92	0.804
Duration of diabetes (years)	6.03±4.09*	8.57±5.75	0.093
HbA1c (%)	6.82±1.14	6.97±1.08	0.643
Valsalva ratio	1.12±0.10	1.12±0.08	0.087
E/I ratio	12.1±4.79	13.4±3.95	0.291
30s/15s ratio	1.04±0.09	1.03±0.07	0.591
BP response to lying to standing (mmHg)	11.17±13.1	12.57±9.67	0.085
BP response to handgrip test (mmHg)	25.10±13.75	26.48±11.60	0.911
Ewing score	2.07±1.1	2.07±0.86	0.780

Analysis of patients according to cardiovascular autonomic reflex tests and Ewing score before and after intervention



Probability of CAN before and after the intervention



CAN+ patients 65% (n=33)

Ewing score: 2.61 ± 0.74

CAN- patients 35% (n=18)

Ewing score: 1.08 ± 0.58

$p=0.000$

Conclusions

- CAN is a common complication of diabetes.
- CAN often goes unrecognized.
- Physical activities can improve autonomic status.