

Background

- Cardiac autonomic function regulates the cardiovascular response to physiological demands and can be assessed using heart rate variability (HRV) and recovery (HRR)^{1,2}.
- HRV and HRR are impaired in adults with inflammatory bowel disease (IBD), but few studies have assessed HRR and HRV in children with IBD^{3,4,5}.

Objectives

- Compare HRR and HRV in children with IBD and controls.
- Investigate the relationship between HRV and HRR in children with IBD and healthy controls.

Methods

- Children aged 7-17 years with a single confirmed diagnoses of IBD for ≥ 1 year and healthy controls (CNT) completed a single study visit that included measurements of:
 - HRV** – HR was recorded for 5 minutes with a single lead ECG with participants laying supine. It was then analyzed in both the time and frequency domain.
 - HRR** – HR was recorded every min during an aerobic fitness test and every 30s during a 2-min recovery. Recovery HR was subtracted from peak HR achieved to determine HRR at 30s, 60s, 90s, and 120s.

Results

	IBD	CNT
N (% female)	23 (40%)	51 (45%)
Age (years)	14.3 \pm 1.9 (10.4 – 17.8)	11.6 \pm 2.8 (7.4 – 17.6)
Height %ile	48.0 \pm 29.2 (1.4 – 97.9)	66.0 \pm 27.8 (0.7 – 100.0)
Weight %ile	45.9 \pm 28.7 (0.9 – 93.3)	60.8 \pm 28.1 (5.2 – 99.9)

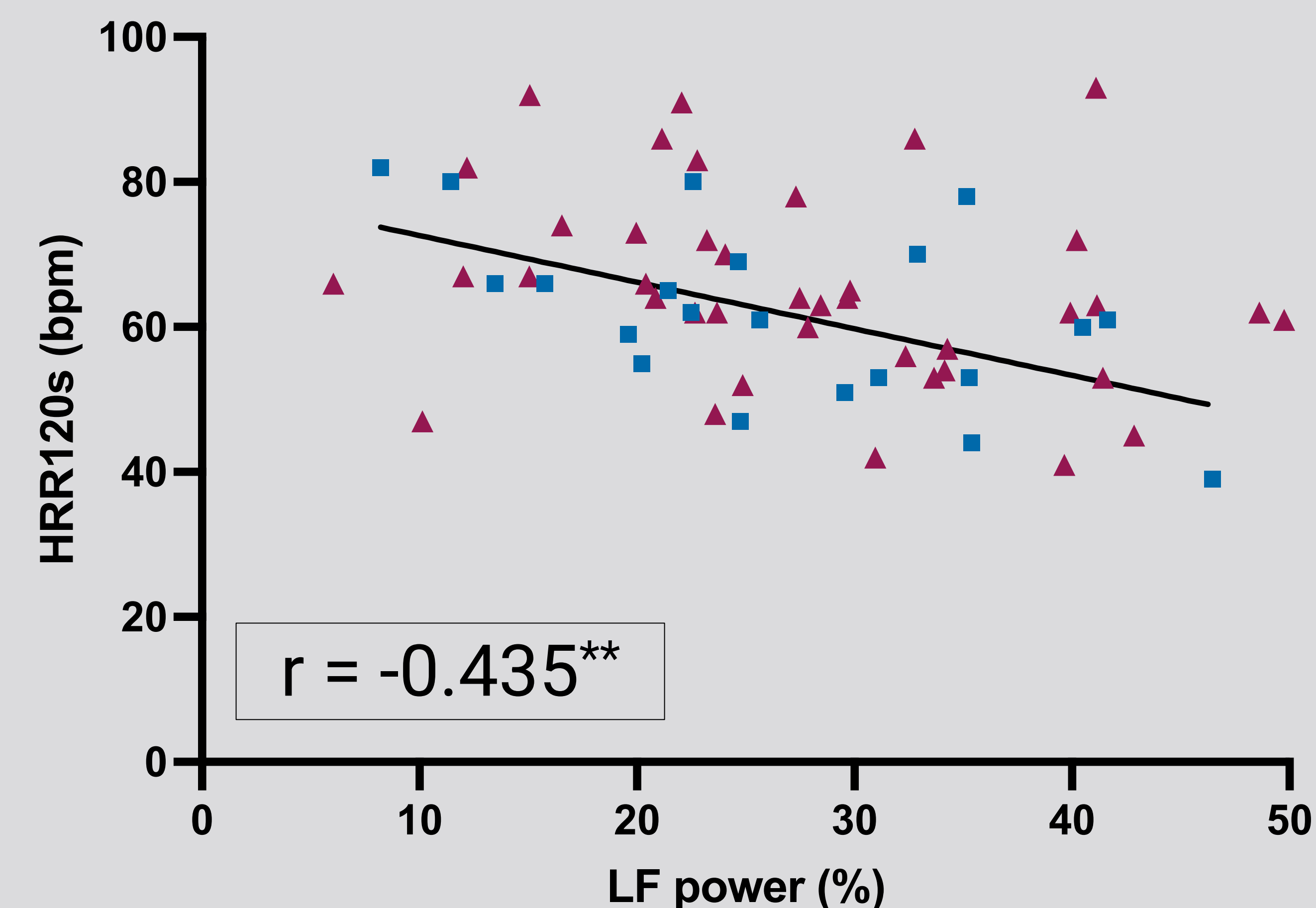
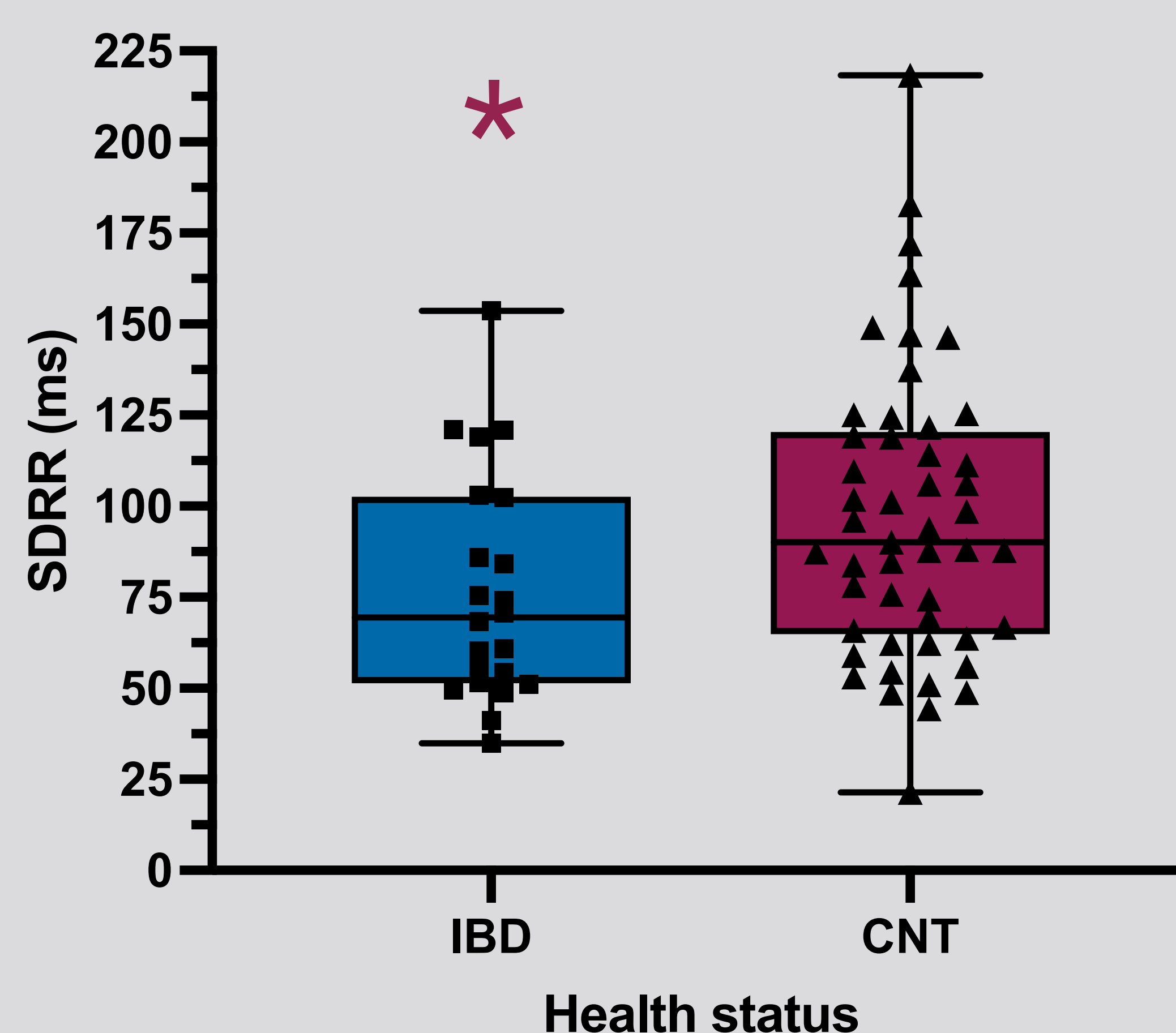
Presented as mean \pm SD (min – max); CNT, control; FFM, fat-free mass; IBD, inflammatory bowel disease.

- LF power and LF:HF were significant predictors of HRR at 90s ($F(3,58)=13.24$, $p < 0.001$, $r^2=0.407$), and 120s ($F(3,57)=12.88$, $p < 0.001$, $r^2=0.404$; $F(3,57)=11.37$, $p < 0.001$, $r^2=0.374$) in IBD and CNT.

Discussion

- HRV predicted HRR at 90s and 120s in IBD and CNT:
 - Low frequency power reflects sympathetic and parasympathetic activity, which drive 90s & 120s HRR.
- Our findings suggest potential altered cardiac autonomic function in IBD; future studies should examine potential mechanisms for this observed differences.

Children with IBD have lower HRV compared to controls. HRV predicts HRR in IBD and controls.



References

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