

Bromocriptine Improves Central Aortic Health in Adolescents with Type 1 Diabetes Mellitus

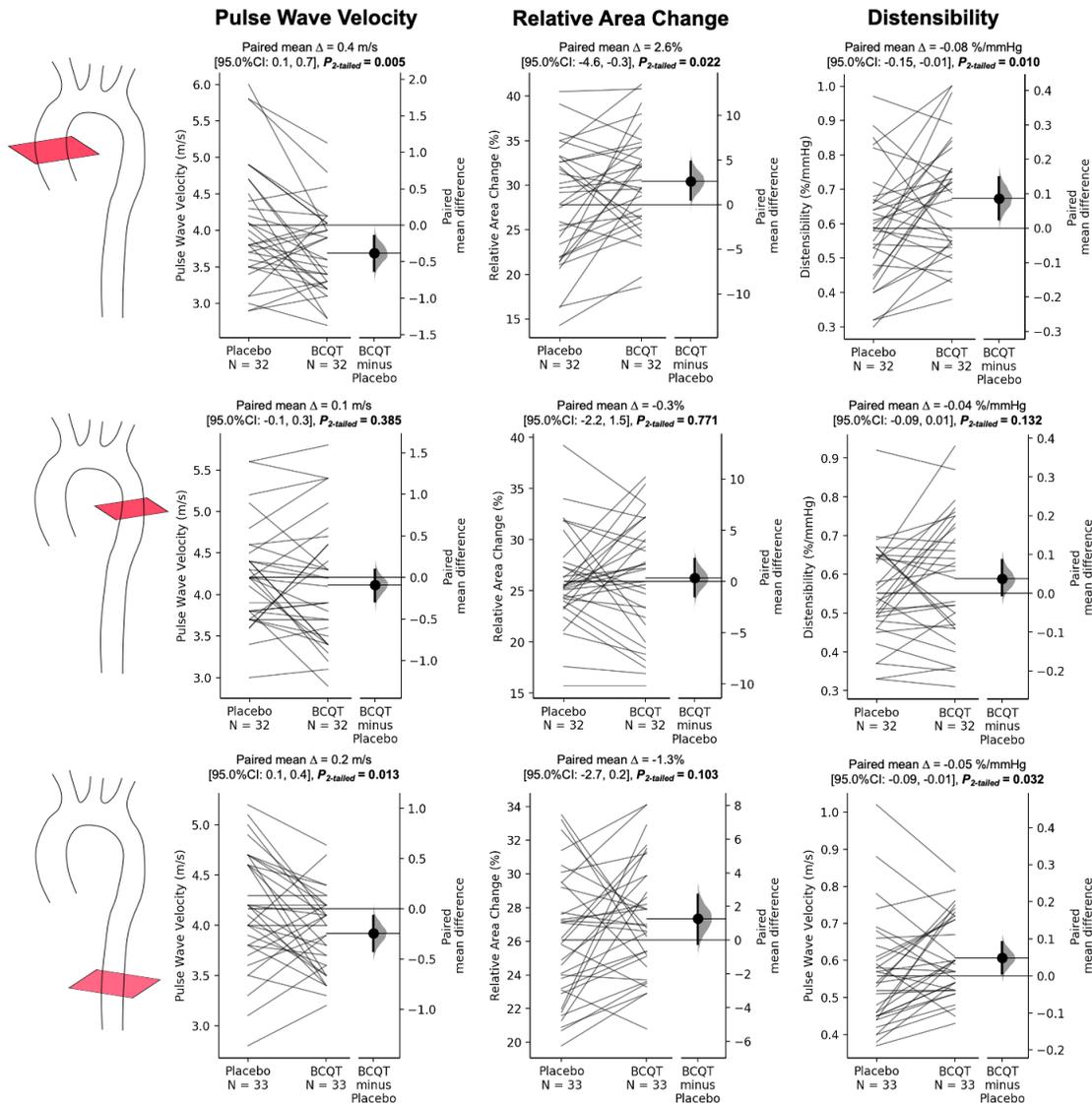
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Purpose of study: The presence of global vascular dysfunction and central aortic stiffness is a well-recognized feature in youth with type 1 diabetes (T1D). This predisposes young patients to the life-long exposure to elevated ventricular afterload and increased incidence of cardiovascular events. Therapeutic strategies to mitigate vascular dysfunction are urgently needed. We hypothesized that bromocriptine quick release (BCQR) therapy would improve vascular health in youth with T1D.

Methods: This was a placebo-controlled, random-order, double-blinded, cross-over study investigating BCQR as adjunct therapy on central aortic stiffness as measured by phase-contrast MRI. Participants also underwent flow mediated dilation test and brachial distensibility evaluation using tonometry. Adolescents with T1D were randomized 1:1 to phase-1 of 4-week BCQR (minimum dose 1.6 mg daily) or placebo therapy after which all vascular measurements were performed. Following a 4-week washout period, phase 2 was performed in identical fashion with the alternate treatment.

Summary of Results: Forty-two adolescents (mean age 15.9 yrs, HbA1c 8.6%, BMI %ile 71.4, TD duration 5.8 yrs) with T1D were enrolled. BCQR therapy decreased systolic ($\Delta = -5$ mmHg, $p < 0.001$) and diastolic blood pressure ($\Delta = -2$ mmHg, $p = 0.039$). BCQR therapy reduced ascending aortic pulse wave velocity (PWV) ($\Delta = -0.4$ m/s, $p = 0.005$), and increased relative area change (RAC) ($\Delta = -2.6\%$, $p = 0.022$), and distensibility ($\Delta = 0.08$ %/mmHg, $p = 0.010$). In the thoraco-abdominal aorta, BCQR decreased PWV ($\Delta = -0.2$ m/s, $p = 0.013$) and increased distensibility ($\Delta = 0.05$ %/mmHg, $P = 0.032$) (FIGURE). In contrast, BCQR decreased reactive hyperemia index (RHI) ($\Delta = -0.34$, $p = 0.006$).



Conclusions: BCQR therapy improved central aortic stiffness and pressure hemodynamics in adolescents with T1D over 4 weeks. However, BCQR decreased peripheral RHI. BCQR therapy might serve as a potential clinical intervention to attenuate accelerated aortic stiffness in youth with T1D supporting future longer-term studies.