

Cardiac size and function in children with subclinical hypothyroidism

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Introduction

The management of subclinical hypothyroidism (SH) is still challenging in particular for mild forms with TSH levels ranging between 4.5 and 10 mU/L.

Objectives

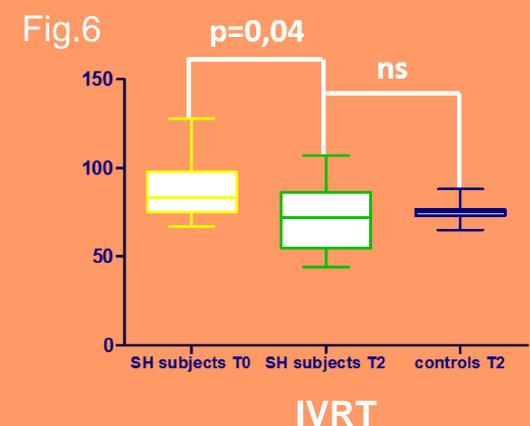
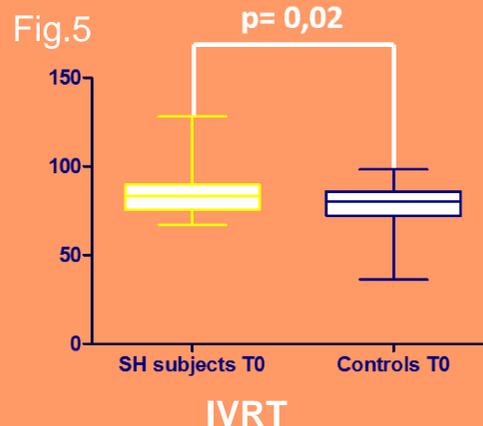
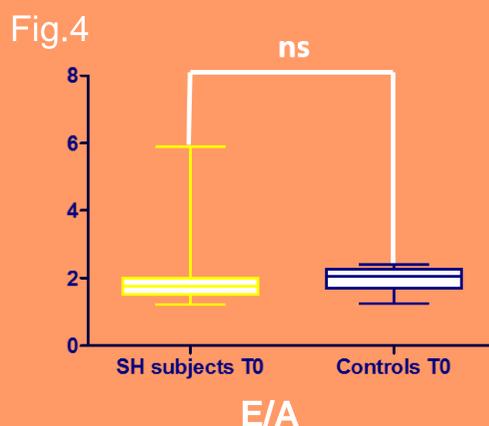
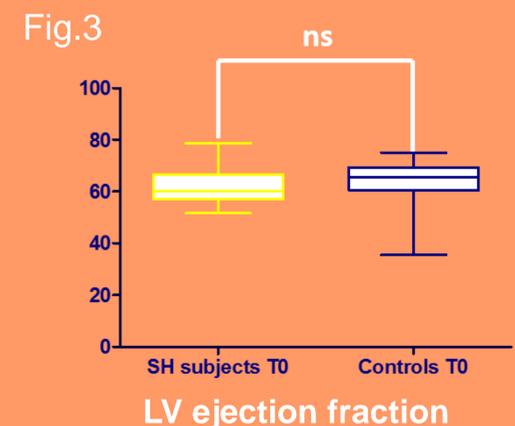
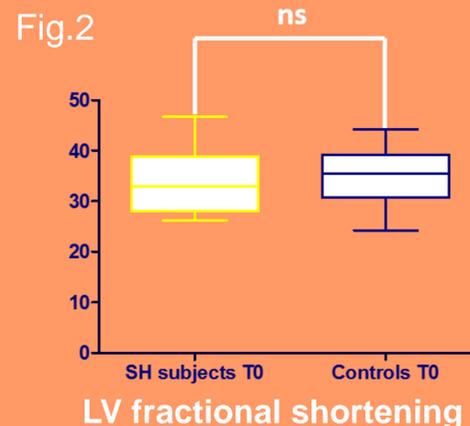
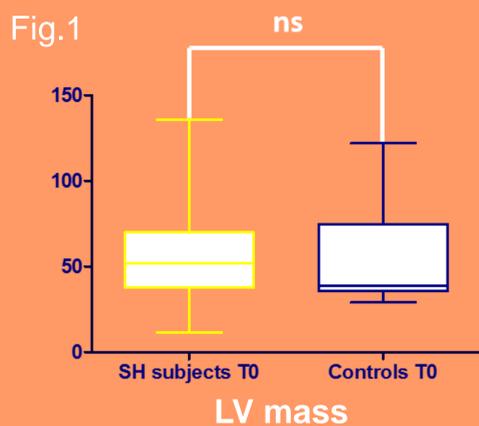
To compare left ventricular (LV) geometry and function of SH subjects and matched euthyroid controls, and to evaluate the effect of L-thyroxine (L-T₄) therapy on cardiac parameters.

Methods

Thirty-six (36) children (19 females and 17 males), aged 8.6 ± 3.7 years, with persistent SH (at least 2 years) and 36 euthyroid matched controls were enrolled in the study. At study entry height, BMI, heart rate, systolic and diastolic bloody pressure were assessed and Doppler echocardiography was performed in all subjects. Twenty-two SH children, who accepted to start L-T₄ therapy, were reevaluated after 2 years of treatment and 22 matched controls were observed throughout the same period.

Results

LV size (Fig.1), systolic function (Fig. 2 and Fig. 3) and E/A, an index of diastolic function (Fig.4), were comparable between SH subjects and controls at baseline and increased similarly over time, whereas SH children showed a significant prolongation of isovolumic relaxation time (IVRT) (Fig. 5) (87.2 ± 2.5 msec) compared to controls (78.8 ± 2.5 msec, $p = 0.02$), even-though still within normal values for age¹. In the 22 SH children who underwent L-T₄ therapy the IVRT significantly decreased (74.6 ± 3.4 msec) vs baseline value (85.5 ± 3.1 msec, $p=0.04$) and became similar to controls (74.9 ± 1.3 msec) (Fig.6).



Conclusions

Long lasting mild SH in children seems to be associated with mild subclinical diastolic dysfunction, which improved with L-T₄ therapy. Whether this subtle alteration may lead to clinical consequences should be further investigated.

References:

1. Cui W, Roberson DA, Chen Z, Madronero LF, Cuneo BF. Systolic and diastolic time intervals measured from Doppler tissue imaging: normal values and Z-score tables, and effects of age, heart rate, and body surface area. *J Am Soc Echocardiogr* 2008 ;21(4):361-70. Epub 2007 Jul 12.