Controlled Antenatal Thyroid Screening (CATS) II: long-term cardiometabolic effects of treating maternal sub-optimal thyroid function

I Muller1, PN Taylor2, R Daniel3, C Hales1, A Scholz1, X Yin1, T Candler3, RJ Pettit4, WD Evans4, D Shillabeer5, MS Draman2, CM Dayan1, C Tanga1, O Okosie1, JW Gregory5, JH Lazarus1, DA Rees1, M Ludgate1

1 Thyroid Research Group, Division of Infection & Immunity, Cardiff University
2 Division of Population Medicine, School of Medicine, Cardiff University
3 MRC The Gambia at the London School of Hygiene and Tropical Medicine
4 Department of Medical Physics and Clinical Engineering, University Hospital of Wales, Cardiff

Introduction

• Alterations of the thyroid function, even if minor, have been found to affect body composition and cardiometabolic risk in adults (1,2). Similar effects of maternal thyroid function on offspring have not been investigated so far.

• The Controlled Antenatal Thyroid Screening (CATS) study I was a randomized trial investigating the effects of levothyroxine (LT4) treatment for suboptimal gestational thyroid function (SGTF) on offspring’s cognitive function. SGTF was defined as FT4 <2.5th percentile and/or TSH >97.5th percentile at 12 weeks median gestation (3). The CATS II is a follow-up study evaluating cognitive outcomes in the offspring at a later mean age of 9.5 years (4).

Objectives

Evaluate in CATS II cohort whether SGTF and LT4 correction impact on long-term anthropometric - cardiometabolic outcomes of mothers and children.

Methods

328 mothers (and 326 paired children) evaluated 5-11 years after pregnancy:

• 197 with normal gestational thyroid function (NGTF)

• 56 with untreated SGTF (SGTF-U)

• 79 with treated SGTF (SGTF-T): 150 μg LT4 daily

Data collection:

• Medical & lifestyle history

• Body mass index (BMI). For children BMI standard deviation scores (SDS) were also considered, based on UK 1990 reference population (5,6). For mothers CATS II BMI was also compared with baseline BMI at CATS I.

• Current thyroid function (TSH, FT4, FT3, TPOAb)

• Blood (fasting) metabolic indicators: insulin, glucose, adiponectin, full lipid profile (triglycerides, total and HDL cholesterol)

• Vicorder® analysis of vascular function: heart rate, systolic pressure, diastolic pressure, augmentation index, total peripheral (vascular) resistance, aortic pulse wave velocity.

• Dual-energy x-ray absorptiometry (DXA) scan of lean/fat mass

Comparison of NGTF, SGTF-U, SGTF-T groups using Linear Regression adjusted for age, social class, ethnicity, smoke during pregnancy, gender (children).

Results - Children

• Age at evaluation (mean ± SD): 9.3 ± 1.0 years.

• Gender: 168 males (M): 51.5%, 158 females (F): 48.5%.

• No significant differences were observed across the 3 groups in terms of:

  • BMI SDS, but tot children were +0.49 SDS compared with 1990 (Tab 1)

  • Vicorder® and DXA scan analyses

• Blood metabolic indicators and thyroid function

References

1. Knudsen K et al: Small differences in thyroid function may be important for body mass index and the occurrence of obesity in the population. JCEM 2005. 90(7):4019-24

Poster presented at...