LEVOTHYROXINE THERAPY AFFECTS CEREBRAL BLOOD FLOW AND FATIGUE IN SUBCLINICAL HYPOTHYROIDISM

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Background

- Overt and subclinical hypothyroidism alter cerebral blood flow (CBF) [1]
- Subclinical hypothyroidism (SCH) is associated with fatigue [2]

Research Question

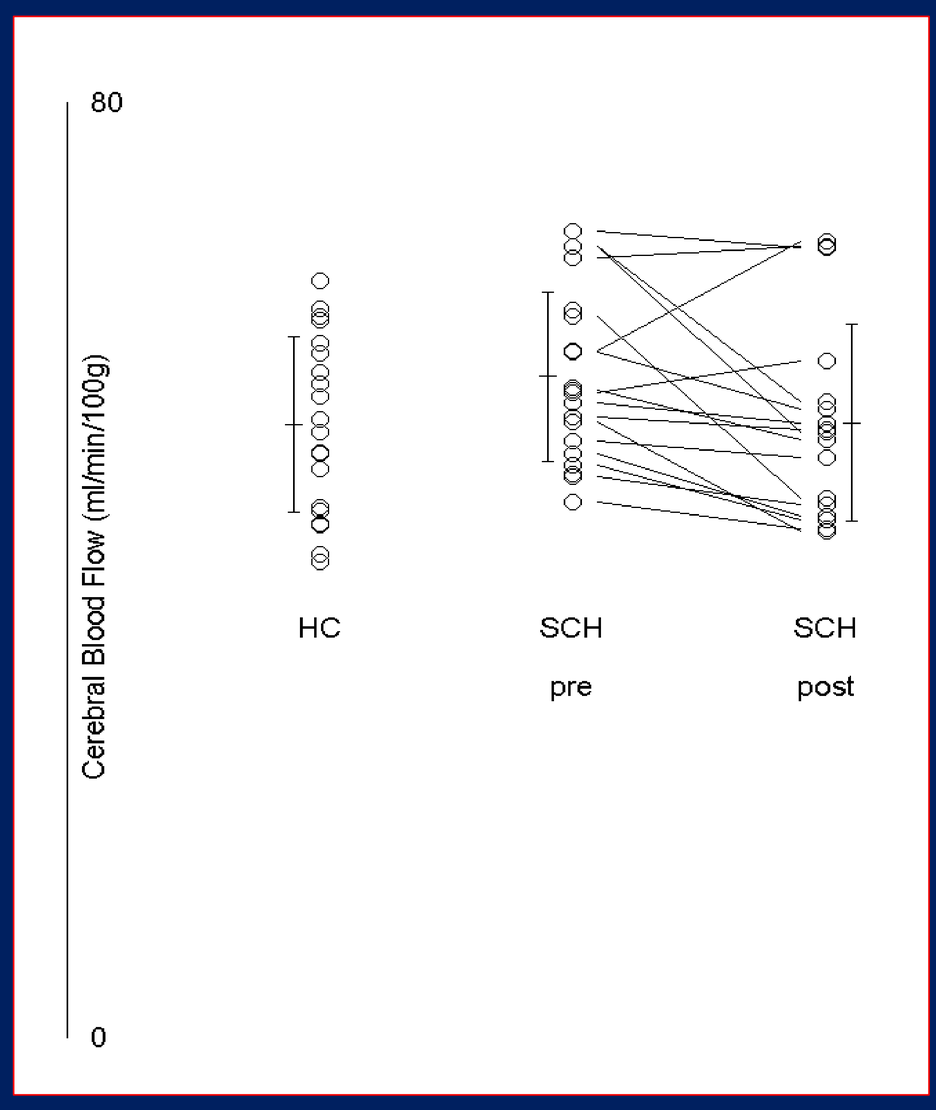
- The relationship between fatigue and CBF in SCH is unclear
- The effects of levothyroxine treatment (T4T) on CBF in SCH patients is unknown

Methods

- CBF was measured using arterial spin labelling (ASL) magnetic resonance imaging (MRI) on a 3T scanner
  - Measurement in Healthy controls (HC) , SCH pre T4T and SCH post T4T
- Fatigue was measured using the fatigue index score (FIS)
  - Measurement in HC, SCH pre T4T and SCH post T4T
- 20 SCH subjects
  - age 40.2±12.1, 17 females and 3 males
  - serum thyroid stimulating hormone (TSH) between 4-10 mU/L and normal serum free thyroxine
  - FIS of more than 40
  - 6 months T4T (1.6mcg/kg) daily
- 20 age and gender matched HC with FIS of less than 20

Results

	HC group	SCH group	
		Pre T4T	Post T4T
TSH (mIU/L)	2.1± 0.9	6.7±1.8	1.9 ± 1.0
FIS	4.3±5.0	76.6±23.7	34.2 ± 35.7
Grey Matter CBF (ml/100g/min)	46.9±5.8	48.8±6.9	46.7 ± 8.5



- CBF in SCH was non-significantly higher than in HC (p=0.3)
- CBF showed a significant decrease after T4T (p=0.013)
- At baseline FIS were not correlated with CBF in SCH

Discussion

We found in SCH a non-significant increase in CBF, which was significantly reduced by T4T to the level seen in HC. This suggests that increased CBF was secondary to SCH state. We postulate that slight increase in CBF in SCH may be an over-compensatory response to tissue hypothyroidism. The observed fatigue was not associated with CBF in SCH. However due to wide inter subject variability of CBF a larger number of subjects may be required to show a true relationship between FIS and CBF.

References

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2. Razvi S, et al. J Clin Endocrinol Metab 2007;92:1715-1723

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