

P1-092. EMOTIONAL INTELLIGENCE SCORES IN CHILDREN AND ADOLESCENTS WITH SUBCLINICAL HYPOTHYROIDISM – CORRELATION WITH SERUM SEROTONIN AND THYROID STIMULATING HORMONE (TSH) CONCENTRATIONS



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INTRODUCTION

Thyroxine is important for nervous system development¹. Subclinical hypothyroidism (SCH), a mild thyroid dysfunction, is associated with impaired cognitive function in children and mood disorders in adults². Serotonin is also involved in brain development, mood and behavior modulation³.

AIM

The aim of the present study was to investigate the possible interaction between thyroid function tests, serum serotonin concentrations and emotional intelligence.

METHOD

224 schoolchildren from Peloponnese in Greece, aged 11-19 years old, were included into the study, of which 26.3% had SCH. Emotional quotients (EQ), such as well-being, self-control, emotionality and sociability were assessed using the TEIQue-ASF questionnaire, and TSH, fT4 and serum serotonin concentrations were also evaluated.

RESULTS

1. Children and adolescents with SCH had lower EQ total score ($p < 0.001$), EQ Well-being score ($p = 0.025$), EQ Self-control score ($p = 0.029$), EQ Emotionality score ($p = 0.029$) and EQ Sociability score ($p = 0.010$) (Table 1).
2. Children and adolescents with SCH also had lower serum serotonin concentrations ($p < 0.001$).
3. A negative correlation was found between TSH and serotonin levels ($R = -0.439$, ($p < 0.001$)).
4. No correlation was found between obesity (BMI%) or gender and emotional intelligence or serum serotonin levels in children and adolescents with SCH.

Table 1. Baseline characteristics of all studied categories. Values are presented as median (minimum-maximum). EQ: emotional quotient, BMI%: body mass index percentile, TSH: thyroid stimulating hormone, fT4: free thyroxine. Normal EQ scores: 1-7, normal BMI%: 10%-85%, normal serum serotonin concentrations: 101 - 283 ng/ml). Mann-Whitney test were used to calculate the differences between subclinical hypothyroidism and control samples.

Characteristics	Total population N=224	Subclinical Hypothyroidism (SCH) N=59	Control N=165	p-value (SCH vs Control)
Age	15.50 (11.0-19.00)	15.00 (11.00-19.00)	16.00 (11,00-19,00)	0.499
Gender	76 males 148 females	20 males 39 females	56 males 109 females	0.995
BMI %	69.25 (12.60-99.50)	73.90 (26.50-99.50)	68.10 (12.60-98.80)	0.175
EQ total score	4.94 (3.60-6.60)	4.60 (3.60-5.90)	5.00 (3.70-6.60)	<0.001
EQ Well-being score	5.70 (2.50-7.00)	5.20 (2.50-7.00)	5.70 (2.50-7.00)	0.025
EQ Self-control score	4.50 (2.00-6.30)	4.20 (2.00-6.30)	4.50 (2.00-6.30)	0.029
EQ Emotionality score	4.90 (3.10-6.80)	4.80 (3.10-6.60)	5.00 (3.0-6.80)	0.029
EQ Sociability score	4.90 (2.70-6.80)	4.70 (2.70-6.50)	5.00 (2.70-6.80)	0.010
TSH concentrations (mIU/L)	2.06 (0.38-6.27)	4.11 (3.54-6.27)	1.77 (0,38-3.47)	<0.001
fT4 concentrations (ng/dL)	0.95 (0.80-1.95)	0.93 (0.81-1.25)	0.96 (0.80-1.95)	0.008
Serum serotonin concentrations (ng/mL)	117.90 (79.00-166.80)	103.50 (79.00-165.70)	122.30 (92.80-166.80)	<0.001

CONCLUSIONS

This is the first study to evaluate emotional intelligence quotients and serum serotonin concentrations in children and adolescents with SCH. A possible association between TSH and serotonin levels is suggested affecting emotional intelligence scores in this population. Further clarification of the role of thyroid hormones and serotonin in the developing brain is needed to elucidate the effect of a possible crosstalk between the hypothalamus-pituitary-thyroid axis and the serotonin pathway on emotional intelligence.

REFERENCES

1. Smith JW, et al. Thyroid hormones, brain function and cognition: a brief review. *Neurosci Biobehav Rev* 2002; 26: 45-60.
2. Capalbo D, et al. Cognitive Function in Children With Idiopathic Subclinical Hypothyroidism: Effects of 2 Years of Levothyroxine Therapy. *J Clin Endocrinol Metab* 2020; 105: 774-781.
3. Brummelte S, et al. Developmental changes in serotonin signaling: Implications for early brain function, behavior and adaptation. *Neuroscience* 2017; 342: 212-231.

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