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Psychoendocrinology (Thyroid Hormone) and Early Psychosis: Preliminary Findings

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Psychoendocrinology (Thyroid Hormone) and Early Psychosis: Preliminary Findings

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Background

Environmental factors are acknowledged as key determinants of development of schizophrenia. Studies suggest that the altered expression of genes and proteins involved in numerous neurodevelopmental, metabolic, and neurotransmitter pathways can result from inadequate amounts of modulators, transporters and synthesizers.

Endocrinal substances do influence the final common pathway in neurotransmitter dysfunction.

Thyroid hormone is a possible link between genes and environment

Its dysfunction is known during antipsychotic treatment, malignant neuroleptic syndrome, treatment resistant and chronic schizophrenia,

It is regulated by HPA axis, which is widely implicated endocrinal abnormality in psychosis.

Molecular and genetic studies suggest that thyroid hormone receptor is necessary to mediate developmental effect of thyroid hormone

Thyroid in schizophrenia

Known for more than 100 years [Kraepelin 1896, Bleuler 1954 & Gjessing 1974]
High (Morley & Shafer 1982; Prange et al 1979; Spratt *et al* 1982…), Low ([Prange et al 1979, Rao *et al* 1984]…) and Normal (Brambilla 1976; Johnston et al 1987; Plunkett 1964; Rinieras 1980 ….)
Thyroid functions have been reported in schizophrenia.
Treatment with antipsychotics drugs also decrease thyroid levels. (Baumgartner,1988; Riniers, 1980]

Increased, decreased and normal baseline TSH with antipsychotic therapy and unchanged TRH induced TSH response to antipsychotics have also been reported
Thyroid extract was widely used [Bleuler 1954; Brauchitsch 1961]
T_4 is still considered of some use in periodic catatonia [Gjessing 1974]
Hypothalamic-pituitary-thyroid [HPT] access may beneficially modify course of the illness

Roca et al 1990, found that 49% acutely hospitalized psychiatric patients had significant elevation on one or more thyroid hormone levels and a positive correlation between severity of symptoms and FT_4

Higher incidence of thyroid disease in mothers of schizophrenia patients than in control [MacSweeney 1978]

Family history of thyroid disorder was more common in schizophrenia patients [DeLisi et al 1991]

Thyroid antibody in schizophrenia [Othman et al, 1994] demonstrated that 51 out of 249 [20%] with chronic schizophrenia a had thyroid antibodies.

Objective

The objective of the present study was to examine status of TSH in patients of early phase of psychosis.

Hypothesis was that low level of TSH and high levels of T3 is associated with positive symptoms of psychosis due increased sensitivity of adrenoreceptor and dopaminergic activity.

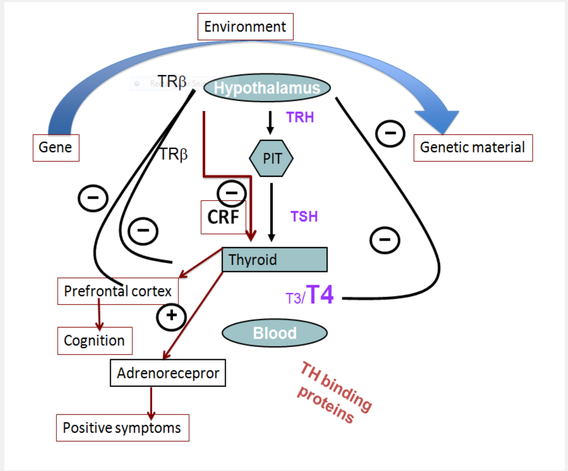
Method

This is a cross-sectional pilot study of early psychosis in a naturalistic setting.
Patients were selected from admitting unit and early intervention of psychosis program in RMHC St. Thomas.

Thyroid hormone levels were obtained from the routine database.

We examined the correlations with psychopathological parameters using the Positive and Negative Syndrome Scale (PANSS) in a cohort of primary psychosis as per DSM IV criteria. Data was analyzed using SPSS.

Patients with any organic factors were excluded however co-morbid substance abuse was not excluded.



Results

Patient characteristics

Males - N = 41; Females - N = 19

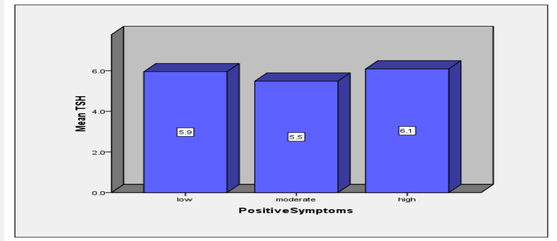
Age range: 17 to 38 (M = 26.5, SD = 4.6)

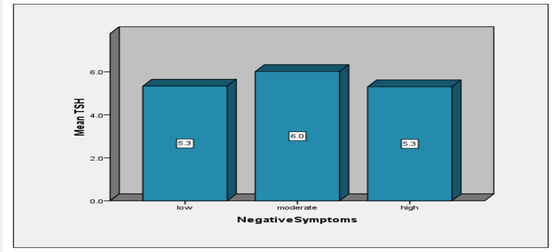
Duration of illness (months): 3 to 38 (M = 14.6, SD = 9.7)

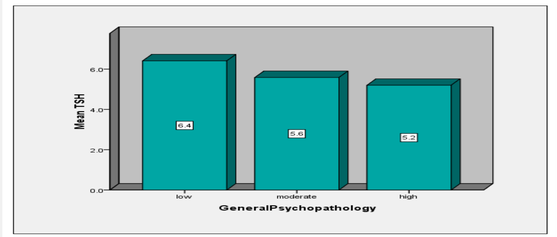
Thyroid hormone (TSH) range = 2.0 to 9.0 (M = 5.76, SD = 1.69)

Results

- Correlations between subscales of the PANSS and family history of psychosis were examined using SPSS
- In a cohort of 60 patients, 43 showed significant hypothyroid state (mean TSH = 6.2 mU/L)
- Correlations of TSH with PANSS subscales
  - Positive Symptoms (PS): r = 0.070, p = 0.595
  - Negative Symptoms (NS): r = 0.128, p = 0.330
  - General Psychopathology (GP): r = -0.360, p = 0.017
- TSH was not correlated with family history of psychosis (r = 0.000, p = 0.999)
- Our results suggest negative relation between TSH and general psychopathology







Discussion

Scores on General Psychopathology significantly correlated with lower levels of TSH

Positive and negative symptom subscales not linearly related to TSH; further research should explore possible quadratic relationships based on patterns in this data

Unchanged level of THS by PS and NS in a cohort of early psychosis is likely because of
- Early phase of psychosis
- Antipsychotic treatment
- Substance abuse as comorbidity
- Methodological limitations

Conclusions

A significant positive correlation with negative symptoms indicates that hypothyroid state may be a symptom concomitant explaining co-existence of depressive and negative symptoms in some patients at least. This likely has implications for psychiatric management in both the short and long term.

More structured studies are required in homogeneous cohort is required to test the hypothesis Future research in this area may help explain the psychoendocrinological complexity of psychosis.

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