Assessment of Thyroid Profile (Ft3, Ft4, Tsh) in Pregnant Ladies with Preclampsia

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ABSTRACT
Pregnancy-induced hypertension (PIH) continues to be a major obstetric problem in present day healthcare practice. Normal thyroid hormone level is essential in maintaining the normal fetal development.

Objective
The objective of the study was to evaluate thyroid function (TSH, FT3, FT4) among normal pregnant women and women with preeclampsia.

Methodology
This case control study, 100 pregnant women (50 normal pregnant, 50 with pre-eclamptic women of age ranging between 16-38 years and have gestational age between 20 to 36 weeks. This study carried in Bahri Hospital, from January to march 2015. In the subjects serum concentrations of FT3, FT4 and TSH estimated using Immuno Enzymometric Assay (TOSOH-A1A-360).

Results
The (mean ± SD) of FT3, FT4 and TSH in preeclampsia were (1.30±0.22, 1.11±0.20, 2.07±0.69) respectively while in normal pregnant women were (2.62±0.28, 1.23±0.23, 1.88±0.67) respectively.

The FT3 significantly decreased (p.v=000.0)

Conclusion
In the present study, the FT3 and FT4 were significantly decreased, while TSH was insignificantly increased.

Keywords: Preeclampsia, Pregnancy, thyroid hormones, Sudanese

INTRODUCTION
Pre-eclampsia (PE), is a leading cause of maternal, fetal, neonatal mortality and morbidity worldwide. Pre-eclampsia is a multi-system mortality disorder of pregnancy, which is characterized by hypertension (Blood pressure > 140/90 mmHg), with proteinuria (urinary protein excretion of >300mg/l in 24hour specimen) after 20 weeks of gestation (1). The exact cause of preeclampsia has not been identified. Numerous theories of potential causes exist including Genetic, dietary, vascular and auto immune factors. The causes of PE remain unknown. However, placental dysfunction may initiate the systematic vasospasm, ischemia and thrombosis that eventually damages maternal organs (2).

In preclampsia liver, kidney and brain are mostly affected, Due to autointoxication functional disorders in these organs.(4) Therefore, the serum concentration of T4 and T3 may different in preeclampsia than in normal pregnancy (5). During pregnancy, there is an increased in thyroid hormone demand, leads to increased in iodine uptake, and synthesis of thyroid hormones. Estrogen induces a rise in serum thyroid binding globulin (TBG) and the placenta releases several thyroid stimulatory factors in excess e.g. human chronico gonadotropin (HCG), Alpha subunit of HCG is identical to that of TSH and has a weak thyrotrophic activity (6, 7).

In preeclampsia, there is failure of estrogen production due to placental dysfunction resulting in
lowering of TBG, T3, T4 hormones along with growth retardation of the fetus (8). The object of this study was to investigate thyroid hormone (T3, T4, and TSH) status among pregnant women with preeclampsia compare with normal pregnant women also to determine the correlation between thyroid profile and severity of preeclampsia.

MATERIALS AND METHODS

This was a descriptive cross sectional study. Carried out from January to march 2015, in the Obstetrics and Gynecology Department of Bahri hospital in-patient admitted with preeclampsia, a total 100 pregnant women were included in this study. Among them 50 women with the diagnosis of preeclampsia selected as case and 50 were normal pregnant women as control. The range of the age of the study group and control group were (27.50±4.65) and (26.64±5.49) years respectively. 5 ml venous blood samples were taken from the cubital vein of preeclamptic women, after the diagnosis was done by consultant. Sera was separated and stored at -20o C until assayed. Free triiodothyronine (FT3), free thyroxine and (FT4) and thyroid-stimulating hormone (TSH) were measured using enzyme immunoassay say (by TOSOH instrument). Data was analyzed statistically by SPSS Software program.

RESULTS

The studied groups had been matched for age and gender. Weight and BMI were significantly raised in preeclamptic women compare with normal pregnant women. Mean blood pressure (both systolic and diastolic) and urine protein were significantly raised in preeclamptic patients compare with normal pregnant women.

Table1. The demographic characteristics of the study population

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control n=50</th>
<th>Case n=50</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>26.64±5.49</td>
<td>27.50±4.65</td>
<td>0.401</td>
</tr>
<tr>
<td>Weight in kg</td>
<td>70.12±6.29</td>
<td>80.18±6.32</td>
<td>0.000</td>
</tr>
<tr>
<td>BMI</td>
<td>25.92±0.89</td>
<td>29.06±1.78</td>
<td>0.000</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>118.26±7.66</td>
<td>169.60±16.03</td>
<td>0.000</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>77.70±5.36</td>
<td>106.82±7.82</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The mean±SD of TSH of the study group and control group were (2.07±0.69) mIU/L and (1.88±0.67) mIU/L respectively and there was no significant difference between the two groups (p = 0.166). The mean of FT3 of the study group and control group were (1.30±0.22) pg/ml and (2.62±0.28) pg/ml respectively and there was highly significant difference between the two groups (p = 0.000). The mean of FT4 (1.11±0.20) ng/ml was in the study group and (1.23±0.23) ng/ml was in the control group. The difference between the two groups was no statistically significant (p = 0.008). Women with preeclampsia had low concentration of FT3 and FT4 levels, and slightly high TSH when compared to normal pregnant women.

Table2. Mean ± SD of FT3, FT4 and TSH in study population

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control n=50</th>
<th>Case n=50</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH (mIU/ml)</td>
<td>1.88±0.67</td>
<td>2.07±0.69</td>
<td>0.166</td>
</tr>
<tr>
<td>FT4 (ng/ml)</td>
<td>1.23±0.23</td>
<td>1.11±0.20</td>
<td>0.008</td>
</tr>
<tr>
<td>FT3 (pg/ml)</td>
<td>2.62±0.28</td>
<td>1.30±0.22</td>
<td>0.000</td>
</tr>
</tbody>
</table>

DISCUSSION

Our finding in this study revealed that the weight and BMI in preeclamptic pregnant women were higher compared to control; increases in weight and BMI are associated with an increase in body fat percentage levels. It is known that preeclampsia is associated with hypertriglyceridemia. The above-mentioned interactions along with increased endothelial triglyceride accumulation may result in endothelial cell dysfunction during gestation. Increased triglycerides found in the pregnancy-induced hypertension (which we call preeclampsia) are likely to be deposited in predisposed vessels, such as the uterine spiral arteries. If so, this may contribute to endothelial dysfunction (9, 10). In this research work, the mean (±SD) age of the study group and control group were27.50±4.65 and 26.64±5.49 years respectively and there was no statistically significant difference between the two groups (p>0.05).It was also similar to other findings, Kumar et al found in 2005 the mean (±SD) age of the
study group and control group were 28.40±6.24 years and 27.50±5.91 years respectively (11). Larijani et al observed the mean (±SD) for the age of the study group and control group were 27.09 ±5.24 and 27.04 ±4.42 years respectively (12). Lao TT et al studies the mean age 28.40± 5.20 and 27.50±5.10 years of study and control groups and there was no significant difference between the two groups (13). In the present study, we evaluated thyroid status in normal pregnancy and preeclampsia without detectable thyroid abnormalities. Elevation in serum thyroid hormone levels in pregnancy indicates an important modification of thyroid activity in pregnancy (14), whereas TSH and FT4 were almost same in both groups, women with preeclampsia have statistically significant lower FT3 level. In preeclampsia most affected organs are brain, liver and kidneys (4). Functional disorder in these organs is evident in preeclampsia. The liver and kidney are the most important organs in peripheral deiodination of T4 to T3. So, the reduced extra thyroidal conversion of T4 to T3 (3) was the cause of the highly significant lower FT3 levels in preeclampsia. These results were similar to the findings of Dr. Swapan Das1 et al (15) and controversial to finding of Dhananjaya B.S. et al (16)

CONCLUSION

In the present study, the levels of FT3 and FT4 in Preeclamptic pregnant women were decrease (FT3 significantly decrease PV=000.0) and TSH was increased as compared to normal pregnant women.

REFERENCES


[12] Dr. Swapan Das1 ,Dr. Debasish Char2, Dr. Sanjay Sarkar3, Dr. Tushar Kanti Saha4, Dr. Sucheta Biswas evaluation of Thyroid Hormone Changes in Non-Pregnant, Normotensive Pregnant and Pregnancy with Preeclampsia, Journal of Dental and Medical Sciences. Vol-11(6): 2279-0861 (Nov.- Dec. 2013)