STUDYING SOME PHYSIOLOGICAL PARAMETERS IN PREGNANT WOMEN WITH THYROID GLAND PROBLEMS

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Abstract:
This study was carried out to determine some hormonal and physiological parameters in women who attended Maternity and Children teaching hospital in Ramadi city, from 1st of August 2014 to 1st of April 2015. Ages of patients ranged from 16 - 49 years. The study included 358 blood samples from pregnant and non-pregnant women, sixty five samples were found to be abnormal thyroid function. The remaining 293 samples from healthy pregnant and not pregnant women were used as controls. Women under study were divided into three groups: Pregnant Women with thyroid disorder (Group I), Pregnant Women without thyroid disorder (Group II, control 1), and non-Pregnant Women without thyroid disorder (Group III, control 2). The study showed that there was no significant differences in T3, T4 and FTI levels in patient compared with control 1 (p-value >0.05) while it showed significant difference between patient and control 2 with p-value (<0.05), the means of T3, T4 and FTI in patient were 4.08 ng/ml, 7.10 μg/dl, 69.55 respectively. While there was no significant difference in level of TSH in cases and control 1 and control 2 with p-value >0.05. The mean level of TSH of patient was 18.65 μIU/ml. A comparison in physiological parameters between the three groups with each other showed that there was significant difference in levels of HB, PCV, WBC, RBC, platelet, ESR in cases compared with control 2 with p-value <0.05, but didn’t show significant difference between cases and control 1 with p-value >0.05. The mean levels of patients for HB, PCV, WBC, RBC, platelet, ESR: 10.09 g/dl, 32.09 %, 10.50 X 10^3 Cell/mm^3, 3.08 X 10^6 Cell/mm^3, 198.1 X 10^3 Cell/mm^3, 36.1 mm / h r

Key words: pregnancy, thyroid disorders, physiological changes

Introduction
The thyroid is a small endocrine gland located in front of the trachea. It uses iodine to produce thyroid hormones, which are essential for normal growth, development, maturation and regulation of metabolism when iodine deficiency occurs leading to thyroid hormone deprivation. Children are affected by cretinism, characterized by intellectual deficiency, squint, thyroid dysfunction and short stature. (1) Pregnancy is a physiological state accompanied by a high-energy demand and an increased oxygen requirement which leads to complex alteration in metabolic and hormonal changes in the physiology of maternal-fetal system and the request for thyroid hormones is increased during gestation (2). Due to specific conditions related to the pregnancy period, there are various alteration accompanied with this phase of life. Because autoimmune thyroid disease is common in women during the childbearing period, it is important to understand both the expected changes in thyroid function in normal pregnancy and how pregnancy may affect pre-existing Graves’ disease, hypothyroidism and thyroiditis. Etc. (3).

Thyroid disorders may affect both the pregnant woman and the developing fetus; where thyroid hormones having essential role in embryogenesis and fetal development. As fetus is completely dependent on the mother for thyroid hormone (4). Uncorrected thyroid dysfunction in gestation has adverse effects on fetal and maternal well-being (before and after delivery). The deleterious effects of thyroid dysfunction can also extend beyond pregnancy and delivery to affect neurointellectual development in the early life of the child (2), and also lead to
maternal, fetal, and neonatal morbidity, and mortality. Maternal complications involves miscarriage, pregnancy induced hypertension, placental abruption, preterm labor, heart failure, and thyroid storm. Fetal and neonatal complications include low birth weight, stillbirth, hyperthyroidism, goiter, and hypothyroidism. These observations confirmed the association between thyroid gland dysfunction and haematopoiesis. Many observations have confirmed the association between thyroid gland dysfunction (with immunological thyroid disease) and haematopoiesis and that hematological parameters are changed in this condition such as The hemoglobin level was low of the subjects suffering from immunological thyroid , and turbulences in haematopoiesis and thyroid functional status are major health problems affecting women during pregnancy .

The present study was designed to achieve the following aims :
1- To measure thyroid hormones (tT3 and tT4) in pregnant women to find out the prevalence of thyroid disorders with measurement of TSH and some indexes such as Free Thyroxin Index .
2- To find out some physiological parameters in pregnant women with normal and abnormal thyroid functions, these parameters include : Hb , PCV , WBCs count , RBCs count , Platelets count , ESR

Materials and Methods :
1-Patients and Controls :
The study included Pregnant women in reproductive age who were suffering of thyroid problems, who attended Maternity and Children teaching hospital in Al-Anbar governorate during the period extended from 1st of August 2014 to the 1st of April 2015 . Patients were selected randomly for pregnancy stage and their ages were from 16 - 49 years. Blood samples from apparently healthy non pregnant women and pregnant women with normal thyroid function were used as controls . Ten milliliters (10ml) of venous blood were collected from each of patients and controls to be centrifuged to get pure serum samples .

2-Diagnostic Kits and Chemical Reagents :
The following diagnostic kits and chemical reagents were used :
Enzyme Linked Immuno Sorbent Assay (EELISA) Biomerieux France, was used to measure Total Triiodothyronine (tT3), Total T4, and thyroid stimulating hormone (TSH). IMMULATE 2000 system, Siemens Healthcare Diagnostics Inc. United Kingdom was used for measurement of Free Thyroxine Index (FTI) . Thyroid Uptake (TU) , Turke, s Solution:(gentian violet, glacial acetic acid) , Hayem’s Solution:(sodium citrate , sodium chloride, formalin), Ammonium oxalate, Tri sodium Citrate. All reagents and kits were prepared and applied according to the companies instructions .

Results and Discussion :
Pregnancy is a normal physiological condition is interplay of numerous metabolic and hormonal parameters to meet the demands of growing fetus. Pregnancy causes stress to the maternal thyroid gland. maternal thyroid hormone excess or deficiency can influence the outcome for mother and fetus at all stages of pregnancy. Maternal hypothyroidism is the most common disorder . Pregnancy causes significant changes in metabolism, fluid balance, organ function and blood circulation which are driven by estrogen .

Population Study:
The total number of women included in the study was 358 ( 147 pregnant and 146 non pregnant ). Out of the total number of pregnant women 65 (18.1%) were found to have some abnormalities in thyroid function while the remaining number was found to be normal . Two groups were used as controls , the first group included those pregnant women with normal thyroid function which was considered control 1 , and those who are not pregnant were considered control 2 . According to ages , study population was grouped into 7 groups as described in table (1). The fourth group (31 – 35 years ) and the fifth group (36 – 40 years ) represented the highest number of patient and the highest number of abnormal findings .

Distribution of Pregnant Women According to Gestational Age:
The percentage of pregnant women with problems in thyroid gland function in 1st trimester was 32.3% (10 patients), and percentage of pregnant women with problems in thyroid gland function in 2nd trimester was 27.4% (34 patients) and percentage pregnant women with problems in thyroid gland function in 3rd trimester was 36.8% (21 patients) . While The percentage of pregnant women without problems in thyroid gland function in 1st trimester was 67.7% (21 patients), and percentage of pregnant women without problems in thyroid gland function in 2nd trimester was 72.6% (90 patients) and percentage of pregnant women without problems in thyroid gland function in 3rd trimester was 63.2% (36 patient). ( Table 2) The present study showed the prevalence of thyroid disorder in pregnant especially in 2nd trimester more than other stages the
explanation for that the embryogenesis and fetal development during pregnancy attributed with increased demand thyroid hormones and iodine with the progression of pregnancy for that Pregnancy is a stress test to the maternal thyroid gland , to increase in thyroxin binding globulin, and thyroid stimulation by HCG (11). As Fetus depends in the first 12 weeks on the mother for thyroxine (12). After this period the fetus thyroid become gradually active at the end of first trimester of gestation therefore , The latter physiological condition, indicate the additional request of iodine during pregnancy in the diet to provide the iodine required by fetus thyroid and protect the maternal system (13).

**Distribution of Cases Under Study According to Type of Disorder in Thyroid Function:**

The number of pregnant women with Hypothyroidism was forty patient (61.5%) ,and number of pregnant women with hyperthyroidism was 7 patient (26.2%),while the number of pregnant women with Euthyroid was 8 patient (12.3%). As shown in Table (3) Hypothyroidism in present study was observed in 61.5% .and hyperthyroidism observed in 26.2% the present results are higher than those reported for pregnant Palestine women in Radi, (14)studying which was observed hypothyroidism found in 2.2% and hyperthyroidism in 1.0%. However, the difference between present study and that may be due to the fact that present study samples were collected randomly from the all trimester of pregnancy. While the samples of other study collected during only the first-trimester of pregnancy. Also Lazarus, (15) reported thyroid disorders during pregnancy and the prevalence of hypothyroidism (2.5%) is higher than hyperthyroidism (0.2%) which support the findings of the present study.

**Hormonal assay Results:**

The present study showed no significant difference in T3 and T4 levels in pregnant women with problems in thyroid gland(cases) compared with pregnant women without problems in thyroid gland (control 1) with p-value was (>0.05) while it showed significant difference between cases and non-pregnant women without problems in thyroid gland (control 2) with p-value was (<0.05).and the mean for T3 and T4 of cases higher than control 1 and control 2 the means for three groups of T3 respectively were 4.08 ng/ml , 2.2 ng/ml , 1.84 ng/ml , while the mean for three groups of T4 respectively were 7.10 μg/dl , 7.21 μg/dl , 5.81 μg/dl.

When compare the levels of T3 according to age among three groups show There was no significant difference in level of T3 in cases and control 1 and control 2 .with p-value (<0.05). shown in table (4).

When compare the levels of T3 and T4 according to gestational age between cases and control 1 showed There was significant difference in levels of T3 and T4 with p-value (<0.05),while showed increase of T3and T4 in 2ed and 3rd trimesters compared with 1st trimester and the mean for cases in T3 according to gestational age respectively were 1.51 ng/ml , 2.19 ng/ml , 2.86 ng/ml , while for control 1 were 1.58 ng/ml , 1.79 ng/ml , 1.79 ng/ml.

While the mean for cases in T4 according to gestational age respectively were 5.42 μg/dl , 7.54 μg/dl , 9.21 μg/dl ,and for control 1 were 6.61 μg/dl, 6.95 μg/dl, 7.95 μg/dl .

The present study is in consistent with Khandakar et al. (11), who showed that the levels of thyroid hormones significant increase with the progression of pregnancy especially in 2nd and 3rd trimesters with (p<0.01), as compared to non-pregnant females. This increase may be due to the role of these hormones in embryogenesis and fetal development during this period.

The etiology of this increase in total circulating thyroid hormones involved production of type III deiodinase from the placenta, this enzyme, which converts T4 to reverse T3, and T3 to diiodothyrosine (T2), has extremely high activity during fetal life. (15, 16) another Cause for this increase is due to increased concentrations of plasma TBG (12).

Because of the fetus needs thyroxin for brain development, growth, and lung maturation, the thyroxin is transfer across the placenta more over Placental de-iodinases can convert T4 to T3. Thus if maternal levels of thyroxin are not well maintained in pregnancy, fetus is at risk (17).

Moreover the increased activity of the thyroid gland during pregnancy may be due to Thyroglobulin production which increase during gestation. The increase in thyroglobulin can be seen as early as the first trimester, but it is more manifest in the latter part of pregnancy (18). The structural homology between hCG and TSH lead to the hCG may act as a thyrotropic action causing the large amount of thyroid hormone in this period . HCG possesses an intrinsic thyroid-stimulating activity and perhaps even a direct thyroid growth promoting activity (19).

Also the present study consistent with study of Kaur et al.(20) which showed T3 and T4 hormones also significant increase in their
levels by the progression of pregnancy which reported thatT3 levels increased to 1.3 ng/ml at p≤0.05 in 2nd trimester to 1.4 ng/ml at p≤0.001 in 3rd trimester with respect to 1st trimester. On the other hand T4 levels in blood showed an insignificant increase from 10.4 μg/dl in 1st trimester to 15.2 μg/dl in 2nd trimester but slightly significant increase to 16.02 μg/dl at p≤0.5 in 3rd trimester. In 2nd and 3rd trimester the levels of T3 and T4 were significantly high at p≤0.05 compared with non-pregnant.

The present study showed no significant difference in level of TSH in cases and control 1 and control 2 with p-value (>0.05). The mean TSH level of cases women was higher than that of control1 and non-pregnant women and the means for three groups respectively were 18.65 μU/ml, 2.38 μU/ml, 3.27 μU/ml, as shown in table (4).

When compare the levels of TSH among patient and control 1 and control 2 according to age showed There was significant difference with p-value (<0.05).

When compare the levels of TSH according to gestational age between cases and control 1 showed There was significant difference with p-value was (<0.05) while showed increase of TSH level in 2nd and 3rd trimester compared with 1st trimester. and the means for cases in TSH according to gestational age respectively were 12.45 μU/ml, 12.54 μU/ml, 14.76 μU/ml while for control 1 were 1.72 μU/ml, 2.69 μU/ml, 2.76 μU/ml.

The present study agree with study of Khandakar et al. (11) and Pasupathi, (21) which did not show a significant difference between pregnant and non-pregnant women. That may be due to the patient involved both cases hypothyroidism and hyperthyroidism and also prevalence hypothyroidism more than hyperthyroidism in present study.

The changes in TSH levels may be explained by the fact that the HCG increase in pregnancy and its structure quite similar to TSH, in addition it has thyrotropic activity during the first trimester of gestation that lead to TSH does decrease slightly in the first trimester (19).

These findings support our results . While Radi (14) showed there was no significant association between increasing in gestational age and TSH with (p=0.09). Moreover Khandakar et al. (11), observed There was significant increase in TSH levels with (p<0.01) at 1st, 2nd and 3rd trimesters of pregnancy when compared to that of normal non pregnant females.

Results of the control group showed significant relationship between age and TSH That agree with other studies such as Bocos-Terraz, et al. (22) who reported that TSH showed significant differences(P < .005) according to the age of the mother.

levels of Free Thyroxin Index (FTI) :

The present study showed significantly decrease in FTI levels in cases compared with control 2 with p-value was (<0.05), but didn’t show significant difference between cases and control 1 with p-value was (>0.05) and the means for three groups respectively were 69.55 , 74.55, 120.89. as shown in (table 5).

When comparing the levels of FTI according to age among three groups show There was no significant difference in level of FTI in cases and control 1 and control 2 .with p-value (>0.05).

When compare the levels of FTI according to gestational age between patient and control 1, There was significant difference in level of FTI .with p-value was (<0.05), while showed increase of FTI in 2nd and 3rd trimester compared with 1st trimester and the mean for cases in FTI according to gestational age respectively were 54.34, 74.76, 78.83 . while for control 1 were 31.8 , 54.54, 118.78. The present study consistent with Ball et al. (23) study which showed lower free hormone concentrations compared with non-pregnant women. Also other studies have confirmed that serum free T4 and T3 are ∼25% lower in women at delivery than non-pregnant women.

Das et al., (24) found a very significant rise in FTI at 3rd trimester (p<.01 )compared with 1st trimester, that consistent with present study.

That may be due to with the advancing pregnancy and particularly around third trimester, the presence of some unknown metabolites arising from the pregnancy disturb the binding of T4 with the rising TBG molecules, which can displace and bind T4 molecules (competitively or otherwise) from the rising TBG molecules. The displaced and bound T4 moiety, thus becomes physiologically ineffective. This would, therefore, cause a less proportionate rise in the level of serum thyroxine binding capacity (TBK) . This displacement phenomenon, therefore, tends to constitute a rise in serum free thyroxine index level in the pregnant women.

By contrast Elizabeth et al. (25) showed there was no significant association between increasing in gestational age and FT4 (p=0.575). that does not consistent with present study.

Results of the control groups showed no significant relationship between age and FT4 that doesn’t agreement with Radi, (14) This may be due to fact that the mean age of the control 1 (31 years) and control 2 (31.5 years) which is less than the mean age of cases(32.5
years). While other study detected that the mean age of the control(29.32 years) which is more than the mean age of cases(24.89 years).

**Physiological assay Results:**

**levels of HB, PCV:**

The present study showed no significant difference in HB concentration and PCV between cases and control 1 with p-value(>0.05) but there was significantly decrease in HB concentration and PCV in cases compared with control 2 with p value was (<0.05). and the means of HB for three groups respectively were 10.09 g/dl, 10.4 g/dl, 13.17 g/dl . and the means of PCV for three groups respectively were 32.09%, 33.1%, 41.4% . as shown in table (6).

When compared the HB concentration and PCV among three groups according to age showed There was no significant difference in both cases and control 1 compare with control 2 .with p-value (>0.05).

And When compare the levels of HB and PCV according to gestational age between patient and control 1 showed significant difference between their with p-value was (<0.05). while showed decrease of HB and PCV in 2nd and 3rd trimester compared with 1st trimester and .The means of HB for cases according to gestational age respectively were 10.03 g/dl, 9.73 g/dl, 9.37 g/dl while for control 1 were 11.18 g/dl, 10.63 g/dl, 10.55 g/dl .While the means of PCV for cases according to gestational age respectively were 32.47%, 32.1%, 31.67%, while for control 1 were 35.6%, 32.5%, 32%.

Thyroid disorders and anaemia are common health problems and their prevalence increases during pregnancy.(26,27)

The present study is consistent with Ashour(9) who showed there was a significant decrease in the, haemoglobin concentrations, PCV in females suffering from thyroid disorders . Both TSH and thyroxin play an important role in the process of erythropoiesis during pregnancy. Thyroid hormones deficiency may lead to bone marrow suppression and decrease in erythropoietin production due to the reduction of O2 requirements.(28)

While Ali showed there was significant increase in HB during pregnancy that doesn’t agree with present study .(29)

The result of the present study showed significant reduction in PCV in pregnancy in all three trimesters. This is in line with previous study of (30).

The absorbed iron ranges from 0.8mg/day in the first trimester to 7.5 mg/day in the second trimester in pregnancy. The marked increase in the need for iron in the gestational progression especially at the third trimester due mainly to the increased rate of fetal growth with an enhanced deposition of iron in fetal and placental tissues and an accompanying increase in red cell mass (31)(32).

**Total Number of WBC and RBC:**

The present study showed significantly increase in the Number of WBC in cases and control 2 but showed significantly decrease in the number of RBC in cases compared with control 2 with p-value was (<0.05). while there was no significant difference in the Number of WBC and RBC between cases and control 1 p-value was (>0.05).and the means of WBC for three groups respectively were 10.50 X 10^9 /mm^3, 13.31 X 10^9 /mm^3,7.3 X 10^9 /mm^3 .and the means of RBC for three groups respectively were 3.08 X 10^12 / mm^3, 4.05 X 10^12 / mm^3, 5.32 X 10^12 / mm^3 . shown in table (6)

When compared the Number of WBC among three groups according to age show There was significantly increase in the number of WBC in cases compared with control 2 with p-value (<0.05). but there was no significant difference between cases and control 1 according to p-value (>0.05).

But When compared the Number of RBC among three groups according to age showed There was no significant difference in both cases and (control 1) compare with control 2 .with p value (>0.05).

In comparing the levels of WBC and RBC according to gestational age between patient and control 1 it has been shown significant difference between their with p-value was (<0.05). and means of the number of WBC for cases according to gestational age respectively were 8.69 X 10^9 /mm^3, 8.88 X 10^9 /mm^3 , 10.15 X 10^9 /mm^3 , while for control 1 were 13.07 X 10^9 / mm^3, 13.1 X 10^9 / mm^3, 13.65 X 10^9 / mm^3 , while the means of the number of RBC for cases according to gestational age respectively were 3.28 X 10^12 / mm^3 , 3.16 X 10^12 / mm^3, 2.57 X 10^12 / mm^3 and for control 1 were 4.12 X 10^12 / mm^3, 4.05 X 10^12 / mm^3, 3.94 X 10^12 / mm^3 .

In the present study the leucocyte count was significantly higher compared to that of control 2 and remained elevated throughout pregnancy. This increasing may be due to the immunity building of the fetus body and it is achieved by a state of selective immunotolerance, immunosuppression and immunomodulation in the presence of strong antimicrobial immunity . (33)(34)

The increasing in blood components due to influencing in physiological cases of mother and Erythropoietin is important hormone in synthesis of blood components, and also placenta secrete lactogen hormone
which lead to increasing in the number of blood components especially WBC and this increasing happen also by increasing in estrogen level.\(^{(35)}\)\(^{(36)}\)

While Tumposky et al\(^{(37)}\) showed the increasing in WBC due to the stress result from pregnancy which lead to increasing in adrenal gland action and increase secreting of cortisol .while the total number of WBC increase with progression of pregnancy reaching in maximum range in delivery and this increasing may be due to stress and inflammation\(^{(38)}\). And the increasing WBC in circulating show the active of immune system which including system of killing bacteria and that consider very important to protection the fetus from harmful bodies\(^{(39)}\).

The present study revealed significant decreases in RBCs count, of pregnant women compared to non-pregnant women with P value (<0.05). The decreasing of RBC may be due to the hypothesis which involved the Bone marrow produces both white blood cells and red blood cells from the same precursor stem cells. Therefore, the up regulation of white blood cells causes fewer stem cells to differentiate into red blood cells. This effect may be an important additional cause for the decreased erythropoiesis and red blood cell production.\(^{(40)}\)

**Total Number of Platelet and ESR levels :**

The present study showed significantly decrease in the Number of platelet and showed significantly increase in ESR levels in cases compared with control 2 with p-value (<0.05) but showed no significant difference in both platelet and ESR between cases and control 1 with p-value(>0.05) and the means of platelet for three groups respectively were 198.1 X 10\(^3\) c/ mm\(^3\) , 309.6 X c/ mm\(^3\), 428.0 X c/ mm\(^3\) .while the means of ESR levels for three groups respectively were 36.1 mm / h r , 42.5 mm / h r , 18.3 mm / h r. As shown in table (6).

When comparing the Number of platelet and ESR among three groups according to age showed there was no significant difference between cases and control 1 with p-value (>0.05), but there was significant difference between cases and control 2 according to age with p-value (<0.05).

When comparing the Number of platelet and ESR levels according to gestational age between patient and control 1 showed there was significantly difference between their with p-value was (<0.05).and means of the number of platelet for cases according to gestational age respectively were 205.8 X 10\(^3\) c/ mm\(^3\), 200.3 X 10\(^3\) c/ mm\(^3\), 193.4 X 10\(^3\) c/ mm\(^3\) while for control 1 were 328.1 X 10\(^3\) c/ mm\(^3\), 299.1 X 10\(^3\) c/ mm\(^3\), 294.6 X 10\(^3\) c/ mm\(^3\).

The present study showed significant decreases in platelet count of pregnant women compared to non-pregnant women with (P-value <0.05) this study agreement with Ali \(^{(49)}\) who reported that mean platelet counts of pregnant women may be slightly lower than in healthy non pregnant women with p-value (<0.05). Also Davies et al. \(^{(41)}\) showed the normal pregnancy correlate with decreasing in platelet count.

Thrombocytopenia associated with Thyroid diseases might be due to an activation of the reticuloendothelial phagocyte system.\(^{(42)}\)

Also thrombocytopenia in patients with hyperthyroidism may be due to autoimmunity against thrombocytes.\(^{(43)}\)

In the present study the value of ESR was significantly increased in pregnant women compared with non-pregnant. This is supported by observation of other studies such as \(^{(44)}\)\(^{(45)}\)

This increase may be a result of anemic state of studied patient group due to plasma volume expansion and decrease in PCV and it may also be due to increased level of fibrinogen in pregnancy.\(^{(46)}\)

In pregnancy, the erythrocyte sedimentation rate and rouleaux formation are increased. This is due to increase in content of plasma and globulin and fibrinogen. fibrinogen concentration increases by approximately 50%.this increasing will enhance rouleaux formation.\(^{(47)}\) Also Hemodilution during pregnancy may be another cause of increased ESR.\(^{(48)}\)

Also studying by Van Den Broek and Letsk \(^{(49)}\) showed The ESR revealed significant increase in the course of pregnancy from 1st to 3rd trimester and this confirms the present study. The relative plasma viscosity increased progressively from 1st to 3rd trimester at a significant level in pregnant women compared to non-pregnant women and also Fibrinogen concentration increased gradually from 1st to 3rd trimester.\(^{(50)}\)
Table 1: Distribution of Study Population According to Age Groups

<table>
<thead>
<tr>
<th>Age groups In years</th>
<th>Total no.</th>
<th>Abnormal thyroid No (%)</th>
<th>Normal thyroid No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 – 20</td>
<td>35</td>
<td>5 (14.3)</td>
<td>30 (85.7)</td>
</tr>
<tr>
<td>21 – 25</td>
<td>45</td>
<td>6 (13.3)</td>
<td>39 (82.7)</td>
</tr>
<tr>
<td>26 – 30</td>
<td>54</td>
<td>12 (22.2)</td>
<td>42 (77.8)</td>
</tr>
<tr>
<td>31 – 35</td>
<td>75</td>
<td>21 (28)</td>
<td>54 (72)</td>
</tr>
<tr>
<td>36 – 40</td>
<td>68</td>
<td>16 (23.5)</td>
<td>52 (76.5)</td>
</tr>
<tr>
<td>41 – 45</td>
<td>40</td>
<td>4 (10)</td>
<td>36 (90)</td>
</tr>
<tr>
<td>46 – 50</td>
<td>41</td>
<td>1 (2.4)</td>
<td>40 (81.9)</td>
</tr>
<tr>
<td>Total</td>
<td>358</td>
<td>65 (18.1)</td>
<td>293 (81.9)</td>
</tr>
</tbody>
</table>

Table 2: Distribution of Pregnant Women According to Gestational Age

<table>
<thead>
<tr>
<th>Gestational age</th>
<th>Total no.</th>
<th>Abnormal thyroid No (%)</th>
<th>Normal thyroid No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st trimester</td>
<td>31</td>
<td>10 (32.3)</td>
<td>21 (67.7)</td>
</tr>
<tr>
<td>2nd trimester</td>
<td>124</td>
<td>34 (27.4)</td>
<td>90 (72.6)</td>
</tr>
<tr>
<td>3rd trimester</td>
<td>57</td>
<td>21 (36.8)</td>
<td>36 (63.2)</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>65 (30.7)</td>
<td>147 (69.3)</td>
</tr>
</tbody>
</table>

Table 3: Distribution of Cases Under Study According to the Type of Thyroid Disorder

<table>
<thead>
<tr>
<th>Type of disorder</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>hypothyroidism</td>
<td>17</td>
<td>26.2</td>
</tr>
<tr>
<td>hyperthyroidism</td>
<td>40</td>
<td>61.5</td>
</tr>
<tr>
<td>Euthyroid</td>
<td>8</td>
<td>12.3</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4: mean level of tT3, tT4, and TSH in patients and controls

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Mean tT3 (ng/ml)</th>
<th>Mean tT4 (μg/dl)</th>
<th>Mean TSH (μIU/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (Patients)</td>
<td>65</td>
<td>4.08</td>
<td>7.10</td>
<td>18.65</td>
</tr>
<tr>
<td>Group 2 (control 1)</td>
<td>147</td>
<td>2.20</td>
<td>7.21</td>
<td>2.38</td>
</tr>
<tr>
<td>Group 3 (control 2)</td>
<td>146</td>
<td>1.84</td>
<td>5.81</td>
<td>3.27</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>1&amp;2=7.7</td>
<td>1&amp;2=0.8</td>
<td>1&amp;2=3.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1&amp;3=0.01</td>
<td>1&amp;3=0.04</td>
<td>1&amp;3=1.0</td>
</tr>
</tbody>
</table>

Table 5: Mean levels of Free Thyroxin Index (FTI) in patient and controls

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Mean FTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (Patients)</td>
<td>65</td>
<td>69.55</td>
</tr>
<tr>
<td>Group 2 (control 1)</td>
<td>147</td>
<td>74.55</td>
</tr>
<tr>
<td>Group 3 (control 2)</td>
<td>146</td>
<td>120.89</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>1&amp;2=0.7</td>
</tr>
</tbody>
</table>
Table 6 : Mean levels of physiological parameters in patients and Controls :

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Mean HB g/dl</th>
<th>Mean PCV %</th>
<th>Mean WBC X 10^3 c/mm^3</th>
<th>Mean RBC X 10^6 c/mm^3</th>
<th>Mean Platele X 10^3 c/mm^3</th>
<th>Mean ESR mm / h r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (Patients)</td>
<td>65</td>
<td>10.09</td>
<td>32.09</td>
<td>10.50</td>
<td>3.08</td>
<td>198.1</td>
<td>36.1</td>
</tr>
<tr>
<td>Group 2 (control 1)</td>
<td>147</td>
<td>10.4</td>
<td>33.1</td>
<td>13.31</td>
<td>4.05</td>
<td>309.6</td>
<td>42.5</td>
</tr>
<tr>
<td>Group 3 (control 2)</td>
<td>146</td>
<td>13.17</td>
<td>41.4</td>
<td>7.3</td>
<td>5.32</td>
<td>428</td>
<td>18.3</td>
</tr>
<tr>
<td><strong>P value</strong></td>
<td></td>
<td></td>
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<tr>
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<tr>
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<td>1&amp;2=0.04</td>
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<tr>
<td>1&amp;2=0.0033</td>
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<tr>
<td>1&amp;3=0.0004</td>
<td>1&amp;2=0.01</td>
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</tr>
</tbody>
</table>

REFERENCES :
34-Luppi P. How immune mechanisms are affected by pregnancy, Vaccine 2003; 21(24): 3352-3357.


دراسة بعض المتغيرات الفسيولوجية عند النساء الحوامل المصابات باضطرابات الغدة الدرقية
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الخلاصة
تضمنت الدراسة تحديد بعض التغيرات الهرمونية والفسيولوجية عند الحوامل المراجعات إلى مستشفى الرمادي التعليمي للنسائية والإطفال للفترة من 1/4/2015 إلى 1/4/2014. شملت الدراسة 358 نموذج من نساء حوامل وغير حوامل. وجد أن 65 امرأة حامل من بين العددين الكلي يعانون من بعض الاضطرابات بالغدة الدرقية بينما وجد أن العدد المتبقي لا يعانين من أي اضطراب. أجريت اعمار النساء بين 16 - 49 سنة. شملت الدراسة أيضاً العددين المتبقيين من النساء اللائي لا يعانين من مشاكل بالغدة الدرقية والبالغ عددهم 293.
قسم العددين الكلي للنساء قيد الدراسة إلى ثلاث مجموعات: المجموعة الأولى شملت النساء الحوامل اللائي ثبت معدلات من اضطراب الغدة الدرقية، والمجموعة الثانية شملت النساء الحوامل اللائي ثبت عدم معدلات من اضطراب الغدة الدرقية، أما المجموعة الثالثة فقد شملت النساء غير الحوامل ولا يعانين من مشاكل بالغدة الدرقية بسبيطة تاية. بينت الدراسة عدم وجود فروق معنوية في مستويات FT3 وT4 وT3 عند مقاربة المجموعة الأولى بالثانية بينما لا يبين وجود فروق معنوية واضح عند مقارنة المجموعة الأولى TSH بين المجموعة الأولى والثانية. وجد أن معدلات مستويات FT1 و T4 وT3 بالمجموعة الأولى 4.08 ng/ml و7.10 μg/dl و69.55 على التوالي، بينما لا يبين وجود فروق معنوية في مجموعات HB, PCV, WBC, RBC, platelet, ESR.

198.1 X 10^3 Cell/mm^3, 36.1 mm / hr.