

## MATERNAL AND FOETAL OUTCOME IN PREGNANCIES COMPLICATED WITH HYPOTHYROIDISM IN PUNJABI WOMEN

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### ABSTRACT

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Pregnancy is a state that places great physiological stress on both the mother and the foetus. When pregnancy is compounded by endocrine disorders such as hypothyroidism, the potential for maternal and foetal adverse outcomes can be immense.

#### OBJECTIVE

We performed a study to know the incidence of hypothyroidism in Punjab and to know the various maternal and foetal complications associated with it.

#### MATERIAL AND METHODS

A retrospective study was performed on pregnant patients delivered between 2010-2014 in Dayanand Medical College and Hospital, Ludhiana. The patients were evaluated for antenatal, intrapartum and postpartum maternal and foetal complications, period of gestation at delivery, mode of delivery and neonatal outcome.

#### RESULTS

Out of total 5400 pregnant women who delivered at DMCH, Ludhiana, 189 (3.5%) women were hypothyroid. History of spontaneous abortions was present in 54 (28.57%) women and gestational hypertension was present in 22 (11.64%) women. Preterm rupture of membrane was present in 18 (9.52%) women. GDM was present in 9 (4.76%) women and oligohydramnios was present in 14 (7.40%) women. Caesarean section was done in 37 (46.56%) women, out of which 37 (19.58%) had foetal distress. There were 94 (49.74%) women who delivered between 33-37 wks. gestation. PPH was present in 8 (4.23%) women. There were 87 (46.03%) babies who were having low birth weight and there were 6 (3.17%) neonatal deaths. There were 8 (4.23%) still births.

#### CONCLUSION

As hypothyroidism is associated with various maternal and foetal complications, proper diagnosis and treatment should be done.

#### KEYWORDS

Gestational, Diabetes Mellitus, Maternal, Foetal, Glucose, Outcomes.

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#### INTRODUCTION

Pregnancy is a state that has a great impact on the thyroid gland and its functions. In pregnancy, the levels of T3 and T4 increase due to the increased Thyroid Binding Globulin levels (TBG). Due to the thyrotrophic action of hCG, the levels of TSH decrease in pregnancy.<sup>1,2</sup> In pregnant patients with limited thyroidal reserve, hypothyroidism develops. So the range of TSH throughout the pregnancy is lowered. In first trimester, upper reference limit is 2.5 uIU/mL and for second and third trimester this limit is 3 uIU/mL.<sup>3</sup>

Incidence of overt hypothyroidism is approximately 0.5%.<sup>4,5</sup> which is defined by fall in free T4 levels and rise of TSH levels.<sup>6,7,8</sup> Overt hypothyroidism is associated with adverse pregnancy outcomes as well as poor foetal neurocognitive development.<sup>9</sup> Overt hypothyroidism is associated with increased risk of abortion, anaemia, gestational hypertension, gestational diabetes, placental abruption and postpartum haemorrhage.<sup>10,11</sup> There is increased incidence of premature birth, low birth weight and neonatal respiratory distress.<sup>12,13</sup> It has also been associated with increased risk of foetal loss and perinatal mortality.<sup>14</sup> It may also increase the rate of caesarean section.<sup>15</sup> Prevalence of subclinical hypothyroidism is approximately 1.5%.<sup>15</sup> Various studies have mixed data on the effect of subclinical hypothyroidism on adverse pregnancy outcome.<sup>10,16</sup>

ACOG does not recommend universal thyroid screening. To assess the thyroid status in pregnancy, TSH is the first line screening test. Free T4 is added to confirm the diagnosis.

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Treatment of overt hypothyroidism is recommended to minimize the risk of adverse pregnancy effects. Monitoring with TSH should be done and dose of thyroid replacement therapy should be adjusted accordingly.<sup>17</sup>

### AIM OF THE STUDY

The aim of the study was to evaluate the maternal and foetal outcome in pregnant patients with hypothyroidism in Punjabi population. The study also aims to know the incidence of hypothyroidism in pregnancy in Punjabi population.

### MATERIAL AND METHODS

A retrospective study was done on pregnant patients who were admitted in the Department of Obstetrics and Gynaecology, Dayanand Medical College and Hospital, Ludhiana, from January 2010 to December 2014. Out of the total patients delivered, the patients with overt and subclinical hypothyroidism were taken into the study. Presence of any maternal and/or foetal complication was noted. The data was statistically analysed.

### RESULTS

The total number of patients who delivered in Department of Obstetrics and Gynaecology from January 2010 to December 2014 were 5400. A retrospective analysis of the patients with various associated complications was done.

Total Number of Deliveries	5400
Patients with Hypothyroidism	189 (3.5%)

Out of the total 5400 women, 189(3.5%) women were found to be hypothyroid. Hence, the incidence of the hypothyroidism in pregnant patients in Punjabi population comes out to be 3.5%,

Mean Age of Patients	26+/-5 years
History of Previous Miscarriage	54 (28.57%)

The mean age of women was 26+/-5 years. Out of total 189 women, 54 (28.57%) had history of previous miscarriage.

### Associated Maternal Complications

Gestational hypertension	22 (11.64%)
Gestational diabetes mellitus	9 (4.76%)
Oligohydramnios	14 (7.40%)
PROM	18 (9.52%)
Foetal distress	37 (19.58%)
Caesarean section	88 (46.56%)

There were 22 (11.64%) patients who had gestational hypertension. Gestational diabetes mellitus was present in 9 (4.76%) women. Oligohydramnios was present in 14 (7.40%) women. There were 18 (9.52%) women, who had PROM. Caesarean section was done in 88 (46.56%) women, out of which 37 (19.58%) women had foetal distress.

### PREGNANCY OUTCOME

Preterm delivery	94 (49.7%)
Term delivery	95 (50.3%)

There were 94 (49.74%) women who delivered preterm between 33-37 wks. of gestation. There were 95 (50.3%) women who had term delivery. Postpartum haemorrhage occurred in 18 (19.52%) women.

### FOETAL OUTCOME

Still born	8 (4.23%)
Live born	181 (95.7%)
Neonatal deaths	6 (3.17%)
Perinatal mortality rate	7.4%
Birth weight <2.5 kg	87 (46.03%)

Out of total babies born, 8 (4.23%) babies were stillborn. There were 181 (95.7%) of babies who were live born; however, there were 6 (3.17%) babies who died during the neonatal period. Perinatal mortality was 7.4%. There were 87 (46.03%) babies who had low birth weight (<2.5 kg).

### DISCUSSION

In pregnancy, the size of thyroid gland increases to meet the increased metabolic demands of the body.<sup>18</sup> Patients with limited reserve of thyroid hormone or iodine deficiency develop hypothyroidism in pregnancy. Autoimmune thyroid disease (Hashimoto's disease) and iodine deficiency, especially in endemic areas are the common causes of hypothyroidism in pregnancy.<sup>3</sup> It has been well studied and documented that hypothyroidism in pregnant patients is associated with adverse maternal and foetal outcomes.<sup>19</sup> The incidence of hypothyroidism in our study is 3.5%. The incidence in various other studies has been studied and found to be 4.8%,<sup>18</sup> 2.5%,<sup>20</sup> 2.6%,<sup>21</sup> and 3.69%.<sup>22</sup>

The mean age of women in our study was 26+/-5 years. In various other studies, the mean age was 25.19±4.17 years,<sup>18</sup> 27+/-6 years,<sup>21</sup> and 29±5 years.<sup>10</sup> Early marriage in our country may be one reason for the younger age of presentation in our study. There were 28.5% women who had history of miscarriage. In a study done by Abalovich et al, this rate was 31.4%.<sup>10</sup> In another study by Nambiar et al, this rate was 26.3%.<sup>18</sup> Autoimmune thyroid disease and subclinical hypothyroidism has been associated with increased rates of abortion. Various maternal complications in our study were documented. Gestational hypertension was present in 11.64% in our study. In a study done by Davis et al, 44% untreated hypothyroid women had gestational hypertension.<sup>23</sup> Rate of gestational hypertension in other studies were 26.9%,<sup>24</sup> 15.6%,<sup>25</sup> and 44.6%.<sup>26</sup>

In hypothyroidism, there occurs impaired endothelium derived vasodilatation due to decreased nitric oxide secretion, which causes increased risk of hypertension in these patients.<sup>27</sup> The rate of gestational diabetes mellitus, PROM in our study is 4.76%, 9.52% respectively. Incidence of gestational DM in a study done by Tudela et al was 4.9%.<sup>28</sup> Risk of GDM increases four-fold in women with hypothyroidism.<sup>29</sup> Insulin and thyroid hormones both affect the cell metabolism and any alteration in either of them affects the physiology of other hormone.<sup>30</sup> The incidence of oligohydramnios in our study is 7.4%. In another study done by Sejekan, this rate was 3.9%.<sup>25</sup> In our study, 49.7% of babies had preterm birth. This incidence was 60% in a study done by Rodica et al.<sup>31</sup> The incidence of low birth weight babies in our study was 46.03%. Low birth weight of babies is due to preterm birth of these

babies. The risk of low birth weight increases to three fold in patients with hypothyroidism. In other studies, this incidence was 31%.<sup>23</sup>, 15.4%.<sup>24</sup> and 19.8%.<sup>14</sup> The presence of autoimmune thyroid antibodies is also associated with high risk of preterm birth and hence low birth weight of babies. Coexistence of pre-eclampsia and oligohydramnios also increases the incidence of preterm birth and PROM. In our study, 19.52% of patients had PPH. In similar other studies, this incidence was 19%.<sup>23</sup>, 7%.<sup>24</sup> and 16%.<sup>31</sup> PPH in patients with hypothyroidism is secondary to uterine hypotonia and coagulation disorders.<sup>27</sup>

In our study 46.56% of women underwent caesarean section, out of which 19.58% had foetal distress. The incidence of caesarean section rate was 40%.<sup>31</sup> and 28.7%.<sup>14</sup> in other studies. In hypothyroidism there occurs labour abnormalities due to the associated uterine hypotonia, which increases the chances of caesarean delivery.<sup>31</sup> Apart from this, chances of caesarean section also increase due to foetal distress which may be secondary to various other associated complications. In our study, 4.83% of pregnancies ended in stillbirth. In a study by Leung et al, 1.4% of women had still birth.<sup>26</sup> The overall perinatal mortality in our study was 7.4%. This rate was 3.9% and 1.9% in studies done by Buckshee et al and Sejekan respectively.<sup>24,25</sup> Various complications in hypothyroidism has been associated with perinatal mortality.

#### CONCLUSION

Hypothyroidism in pregnancy is not an uncommon finding. It has been associated with poor maternal and neonatal outcome. Various studies have been done in developed countries to study the incidence and outcome of hypothyroidism in pregnant women. But there are few studies in developing country like India. We, therefore, performed a study to know the incidence of hypothyroidism in pregnant women in Punjab and its consequences on maternal and foetal outcome. It has been seen that hypothyroidism adversely affects maternal and foetal outcome. So, diagnosing the patients with hypothyroidism and starting early treatment and close antenatal and postpartum follow-up of these patients help in preventing and diagnosing the complications associated with hypothyroidism, thus reducing the maternal and foetal morbidities.

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