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### Study of Reproductive profile in Hypothyroid females

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#### Abstract

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**Aims and objectives:** Hypothyroidism is a common endocrinal disorder affecting mainly the females of reproductive group. It affects all the aspects of reproductive functions in females including infertility, abortions, stillbirths and menstrual abnormalities. The present study was undertaken to find the prevalence of reproductive abnormalities in hypothyroid females and to study the incidence of other autoimmune diseases in these females.

**Material and Methods:** The present study was a retrospective cross-sectional type of study conducted on hypothyroid females in the age group of 18-70years who attended the outpatient department at Government Medical College and Rajindra Hospital, Patiala.

**Results:** This study showed that 58.18% cases had abnormal reproductive profile. Menorrhagia was the most common menstrual disturbance present in 34.54%, followed by oligomenorrhoea. 25.45% females had history of abortion and history of still born babies was present in 16.36% females, whereas infertility (whether primary or secondary) was present in 7.27% cases. The most common combination of abnormalities was found to be menorrhagia and abortions, present in 16.36%, followed by oligomenorrhoea and abortions. 18.18% cases had other autoimmune disease associated with hypothyroidism of which majority had rheumatoid arthritis.

**Conclusion:** The prevalence of reproductive abnormalities is high in patients of hypothyroidism, with menorrhagia and abortions being the most common.

**Keywords:** Abortions, Hypothyroidism, Infertility, Menorrhagia, Oligomenorrhoea

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## Introduction

Hypothyroidism is five to eight times more common in females as compared to males<sup>1</sup> and commonly affects females of reproductive age. In women, incidence of hypothyroidism diagnosed before pregnancy is 1%.<sup>2</sup> Hypothyroidism is known to affect all the aspects of reproductive function in females including infertility, abortions, stillbirths and menstrual abnormalities.<sup>3</sup> Maternal and fetal complications have been found to be higher in this population.<sup>4</sup>

Menstrual disturbances are common in hypothyroidism, of which oligomenorrhoea and menorrhagia are the most common. Menstrual irregularities are more frequent in severe hypothyroidism in comparison with mild cases.<sup>5</sup> In women with menstrual irregularities, especially in the perimenopausal age if the thyroid dysfunction is detected, pharmacotherapy may be a superior alternative to surgical intervention like hysterectomy.<sup>6</sup>

Hypothyroid females have a higher prevalence of anovulatory cycles, leading to infertility and in case pregnancy occurs, they have a higher rate of fetal loss in first trimester.<sup>7,8</sup> Thyroid dysfunction adversely affects fertility and role for immunology, including thyroid autoimmunity had been implied.<sup>9</sup> Reproductive failure also precede thyroid dysfunction or goiter. Therefore reproductive dysfunction may be considered as one of the presenting symptoms of thyroid disorders in women.<sup>6</sup>

Chronic autoimmune hypothyroidism is considered as the most common cause of primary hypothyroidism in iodine sufficient areas. Serum concentrations of TPO autoantibodies are elevated in more than 90 percent of patients. Routinely TPO antibodies are not measured in patients with primary overt hypothyroidism, because almost all have chronic autoimmune thyroiditis.<sup>10</sup> There is an increased prevalence of autoimmune disorders in patients of autoimmune thyroiditis for the following diseases: chronic autoimmune gastritis, vitiligo, rheumatoid arthritis, polymyalgia rheumatica, celiac disease, diabetes mellitus, sjogren's disease, multiple sclerosis, systemic

lupus erythematosus, sarcoidosis, alopecia, psoriatic arthritis, and systemic sclerosis.<sup>11</sup>

The objective of this study was to determine the incidence of reproductive abnormalities, including menstrual irregularities, infertility and abortions among the female patients. The prevalence of other autoimmune diseases was also studied in these patients.

## Materials and Methods

This was a retrospective cross-sectional type of study conducted on hypothyroid females who attended the outpatient department at Government Medical College and Rajindra Hospital, Patiala. Females in the age group of 18-70 years were included in the study who were already on treatment for hypothyroidism. Cases with secondary hypothyroidism and ante-natal females were excluded from the study. Patients with other associated co-morbid confounding diseases like polycystic ovarian disease, septicemia, other endocrine disorders (hypoparathyroidism, hypogonadism, etc), and females reporting a male factor of infertility were also excluded. After considering these factors, a total of 55 females were included.

Hypothyroidism was diagnosed on the basis of history, physical examination findings (symptoms and signs of hypothyroidism) and thyroid function tests showing high serum levels of TSH and low serum T<sub>4</sub>, T<sub>3</sub>.

A detailed history was taken from the cases regarding the following:

- Age of menarche i.e. onset of menstruation
- Age of menopause i.e. age of permanent amenorrhoea. 12 months of amenorrhoea is required to confirm menopause.
- Menstrual irregularities: Oligomenorrhoea was defined as infrequent, irregularly timed episodes of bleeding occurring at intervals of more than 35 days. Amenorrhoea was defined as absence of menstruation. Menorrhagia was defined as regularly timed episodes of

bleeding that are excessive in amount or duration of flow.<sup>12</sup>

- Infertility: it was defined as an inability to achieve pregnancy after 12 months of unprotected sexual intercourse.<sup>13</sup>
- Abortions in the first trimester and history of stillbirths.
- Other auto-immune diseases for which patient is taking treatment.

All the patients were treated with the adequate individualized dose of thyroxine.

## Results

55 hypothyroid females were studied. The mean age of the cases was  $43.5 \pm 11.2$  years. The range of age was 18-70years. The mean duration of hypothyroidism in the patients was  $7.5 \pm 3.94$  years. Out of 55 females, 32 (58.18%) cases had abnormal reproductive profile. The most common abnormality was menorrhagia, found in 19 cases (34.5%).

**Table 1:**

Total number of cases (%)	Normal menstruation (%)	Oligomenorrhoea (%)	Amenorrhoea (%)	Menorrhagia (%)
55 (100%)	26 (47.27%)	10 (18.18%)	2 (3.66%)	19 (34.54%)

Table 1 showed the menstrual pattern in females in the present study. 47.27% (26 cases) had normal menstruation. Out of all menstrual abnormalities, menorrhagia was the most

common, present in 34.54% (19 cases), followed by oligomenorrhoea, present in 18.18% (10 cases). Amenorrhoea was present in 3.66% (2 cases) females.

**Table 2:**

Total number of cases	Infertility (%)	Abortion (%)	Still birth (%)
55	4 (7.27%)	14 (25.45%)	9 (16.36%)

Table 2 showed that out of 55 females, 27 females (49%) had reproductive failure, in the form of abortions, infertility and still birth. 14 (25.45%) had history of abortion (either one or more than one). History of still born babies was present in 9 (16.36%) females, whereas infertility (whether primary or secondary) was present in 4 (7.27%) females.

Out of 55 females, 32.7% (18 cases) had 2 or more abnormalities. The most common combination of abnormalities was found to be menorrhagia and abortions, present in 16.36% (9 cases), followed by oligomenorrhoea and abortions, present in 7.27% (4 cases).

**Table 3:**

Total number of cases (%)	Total number of cases with other autoimmune disease (%)	Rheumatoid arthritis (%)	Vitiligo (%)	Diabetes mellitus (%)
55 (100%)	10 (18.18%)	7 (12.7%)	2 (3.63%)	3 (5.45%)

Table 3 showed that 10 (18.18%) cases had other autoimmune diseases associated with hypothyroidism. Majority of them had rheumatoid

arthritis, seen in 7 cases (12.7%), followed by diabetes mellitus, found in 3 cases (5.45%). Vitiligo was present in 2 (3.63%) cases.

## Discussion

The present study was undertaken to see the prevalence of various reproductive abnormalities in the females affected by hypothyroidism at Government Medical College and Rajindra Hospital, Patiala. The mean age in our study was  $43.5 \pm 11.2$  years. Mean duration of hypothyroidism was  $7.5 \pm 3.94$  years.

The range of age in the present study was 18-70 years, where as in study conducted by Scott Musset et al<sup>14</sup> the range was 16-40 years. Normal menstrual pattern was found in 47.27% of the females, which was comparable to the study conducted by Scott Musset et al<sup>14</sup>, in which it was 44%. In the study conducted by Joshi et al<sup>6</sup>, 31.8% of the females had a normal menstrual pattern. Krassas et al<sup>5</sup> and Urmi et al<sup>15</sup> found higher number of females with a normal menstrual pattern accounting for 76.6% and 62%, respectively.

Reproductive abnormalities were present in 58.18% cases in the present study. The most common reproductive abnormality was menstrual irregularity, which was found in 52.7% cases which was comparable to the study conducted by Scott Musset et al<sup>14</sup> in which these were found in 56% of the cases. Krassas et al<sup>5</sup> found a lesser number of females with menstrual abnormalities which was 23.4%. Whereas, Joshi et al<sup>6</sup> found a higher incidence of 68%. Considering individual menstrual abnormality, the most common abnormality in the present study was menorrhagia, found in 19 cases accounting for 34.5% of all cases. It was comparable to study conducted by Scott Musset et al<sup>14</sup> in which 21 females had menorrhagia, constituting 42% of all cases. In the studies conducted by Joshi et al<sup>6</sup> and Urmi SJ et al<sup>15</sup> the incidence of menorrhagia was found to be 22.7% and 10.1%, respectively. Oligomenorrhoea was present in 18.18% (10 cases) in the present study which was comparable to the study conducted by Urmi SJ et al<sup>15</sup> in which 21.5% (16 cases) had oligomenorrhoea. Amenorrhoea was present in 3.66% (2 cases) in the present study, compared to 6.3% (6 cases) in the study conducted by Urmi SJ et al.<sup>15</sup> Many studies indicate the abnormal menstrual pattern in

hypothyroid females, most common of which was menorrhagia followed by oligomenorrhoea.

Reproductive failure, which included abortions, infertility and still births, was present in 49.1% cases in the present study, compared to the study conducted by Joshi et al<sup>6</sup>, in which 37.5% females had reproductive failure. In the current study, infertility was found in 7.27% (4 cases), which was comparable to the study conducted by Joshi et al<sup>9</sup> in which 6.2% cases had infertility. In the study by Urmi et al<sup>15</sup> 18.9% females (15 cases) were found to be infertile. In our study, abortions were found to be present in 25.45% (14 cases). Abalovich M et al<sup>16</sup> found in their study that incidence of abortion was 60% in patients with inadequate levothyroxine treatment and 4% in adequately treated patients. Still births accounted for 16.36% (9 cases) in the present study which was comparable to 12% seen by Davis et al.<sup>17</sup> This suggests that various studies have found different patterns of reproductive failures which can be prevented by adequate thyroxine replacement in patients of hypothyroidism.

In the current study it was found that 18.18% females had associated other autoimmune diseases, of which rheumatoid arthritis was seen in the majority (12.7%), followed by Diabetes Mellitus and vitiligo, constituting 5.45% and 3.63% cases, respectively. Kristien et al<sup>18</sup> found other autoimmune disorders in 14.3% of hypothyroid cases. Rheumatoid arthritis was the most common coexisting autoimmune disorder, seen in 4.24% patients. This suggests the importance of screening for other autoimmune diseases in patients of hypothyroidism presenting with nonspecific symptoms, or joint pains.

The discussion highlights the importance of evaluation of hypothyroid females for various reproductive abnormalities, which include menstrual abnormalities and reproductive failure, as they are found to be present in many cases. Also, the patients should be screened for the presence of any other auto-immune disease.

## Conclusion

From this study, it is concluded that there is an increased prevalence of reproductive dysfunction in hypothyroid females. Menstrual irregularities account for the majority of the abnormalities. Hypothyroidism should be diagnosed early, so that early and adequate replacement of thyroid hormone can prevent aforementioned complications. Early diagnosis and treatment of associated auto-immune disorders helps to reduce the long term morbidity associated with these disorders.

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**Conflict of interest:** None declared

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