RESEARCH ARTICLE

Lack of Influence of Pregnancy on the Prognosis of Survivors of Thyroid Cancer

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Abstract

Objective: The aim of this study is to investigate the influence of pregnancy on prognosis of thyroid cancer. **Methods**: A total of 72 patients aged between 15-45 years who underwent total or subtotal thyroidectomy and subsequently radioablation were followed up under suppression. Individuals who had term pregnancies after diagnosis of cancer (group 1, n: 36) and who were non-pregnant (group 2, n:36) were included in the study. Both groups were compared in terms of scintigraphic relapse and metastasis, ultrasonographic relapse, stage change of lympadenopathy at the beginning and at the end of the study. **Results**: Relapse was detected in 4 out of 36 pregnant patients (11.1%) and in 5 out of 36 non-pregnant patients (13.9%) with no significant difference between groups (p=1.00). Pathologic lymphadenopathy was detected in 2 out of 36 pregnant patients (5.6%) and in 2 out of 36 non-pregnant patients (5.6%) (p=1.00), and metastasis in 3 (8.3%) and in 1 (2.8%), respectively (p=0.61). While stage change was detected in only one pregnant patient (2.8%), and none of the non-pregnant again there was no significant difference (p=1.00). **Conclusions**: We conclude that pregnancy does not have an influence on prognosis of thyroid cancer.

Keywords: Pregnancy - thyroid cancer - prognosis

Introduction

Thyroid cancer is the most common endocrinologic malignity and common among young women and vast majority (95%) is originated from thyroid follicular cells (Schneider, 2000). Treatment goals of thyroid cancer are to eliminate the primary tumor, to reduce disease-related morbidity, to provide an accurate staging, to enable postoperative radioactive iodine 131 (I-131) (radioablation), to reduce recurrence and metastatic disease risk in the long term (Hundahl et al., 2000; Jameson and Weetman, 2001). In reproductive age women, approximately 65% of thyroid malignities are papillary cancer, 30% follicular, 3% medullary, 1% anaplastic , 1% lymphoma or metastasis from other organs (Collins et al., 2002). Diagnosis is made by fine needle aspiration biopsy (FNAB), medullary or anaplastic cancer or lymphoma requires immediate surgery.

Prevalence of thyroid cancer is between 3.6-14/100,000 in pregnancy and it is among the most common cancers seen in pregnancy. Approximately 10% of thyroid cancers in reproductive age is seen either in pregnancy or in the early postpartum period (Gibelli et al., 2011). Patients with well differentiated thyroid cancer undergo subtotal thyroidectomy in the seconf trimester or after delivery.

Generating hypothyroidism with adjuvant RAI treatment or scintigraphy tests are postponed to postpartum period in order to avoid from fetal risks arising from maternal hypothyroidism. Waiting until postpartum period does not alter the prognosis of thyroid cancer. If surgical intervention will be postponed to postpartum period, thyroid hormone supression treatment (l-thyroxin) is started until surgery (Gibelli et al., 2011).

In pregnancy, both mother and the fetus are affected from thyroid cancer. However no consensus is available about the influence of pregnancy on thyroid cancer. The aim of this study is to investigate the effect of pregnancy on prognosis of thyroid cancer.

Materials and Methods

Records of patients who were treated and followed up at Department Of Nuclear Medicine, Ege University Medical School between 1991-2013 were analyzed for the study. Ethics committee approval was obtained prior to the study.

A total of 72 patients aged between 15-45 years who underwent total or subtotal thyroidectomy followed by radioablation and being followed up under suppression, who had term pregnancies after diagnosis of cancer (n:

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36) and who were non-pregnant (n:36) were included in the study. Pregnant women consisted group 1 and non-pregnant ones consisted group 2.

Thyroid cancer is treated with total or subtotal thyroidectomy followed by radiablation for residual thyroid tissue or suppression. Patients who receive radioablation therapy are also followed with suppression. In our study, patients who underwent total thyroidectomy, radioablation therapy and followed with suppression were followed up.

Mean, standard deviation, frequency, ratio were used for descriptive statistics and qui-square test was used for proportional analysis. Distribution of variables was evaluated with Kolmogorov Smirnov test. Mann-Whitney U test and independent sample t test were used for comparison of two groups. Fischer test was used when qui-square test did not meet the conditions. Logistic regression was used for analysis of impact level. SPSS 20.0 program was used for analysis. Results were evaluated at 95% confidence interval, significance was evaluated at p level of <0.05.

Results

Of 72 patients, 36 were in pregnant group and 36 were in non-pregnant group with mean age of 26.4±5.6 (15-37) and 32.5±6.5 (15-40) years, respectively. In both groups, there were 2 follicular carcinoma cases and remaining 34 were papillary carcinoma cases and there was not a difference between groups in terms of cancer type (p=0.692). In pregnant group, mean age during pregnancy was 29.9±5.1 (21-40) and duration between diagnosis of thyroid cancer and beginning of pregnancy was 40.5±26.4 (12-120) months and the mean duration after the pregnancy was 2.5±1.4 (1-8) years.

The mean follow-up duration in the pregnant and non-pregnant group was 6.05±2.5 and 5.2±0.5 years respectively. There was no difference between the groups in term of follow-up time (p=0.080).

Both groups were compared in terms of scintigraphic relapse and metastasis, ultrasonographic relapse, lymphadenopathy and stage change at the beginning and at the end of follow up (Table 1).

Relapse was detected in 4 out of 36 pregnant patients (11.1%) and in 5 out of 36 non-pregnant patients (13.9%) and a significant difference was not detected between groups (p=1.00).

Pathologic lymphadenopathy was detected in 2 out of 36 pregnant patients (5.6%) and 2 out of 36 non-pregnant patients (5.6%) and a significant difference was not detected between groups (p=1.00).

Metastasis was detected in 3 out of 36 pregnant patients

Table 1. Comparison of the Groups

	Group 1 (n=36)	Group 2 (n=36)	p
Recurrence on follow up	4 (11%)	5 (14%)	1.00
Lymphadenopathy on follow up	2 (6%)	2 (6%)	1.00
Metastasis on follow up	3 (8%)	1 (3%)	0.61
Stage change on follow up	1 (3%)	0	1.00

(8.3%) and in one of 36 non-pregnant women (2.8%) and a significant difference was not found between groups (p=0.61).

While stage change was detected in only one of 36 pregnant patients (2.8%), it was detected in none of non-pregnant patients and a significant difference was not found detected between groups (p=1.00).

Discussion

Influence of pregnancy on natural course of thyroid cancer is controversial. A significant effect before and during pregnancy was not found in majority of studies. On the other hand there is limited study which shows the effect of pregnancy on the thyroid cancer in the follow-up period of the cancer. In the current study which has the mean follow-up duration in the pregnant and non-pregnant group was 6.05±2.5 and 5.2±0.5 respectively, we did not find a difference between groups in terms of relapse metastasis before and after pregnancy. Hirsch et al. (2010) evaluated 63 consecutive women who were followed 1992-2009 and had given birth at least once after receiving treatment and reviewed for clinical, biochemical, and imaging data. They compared thyroglobulin levels and neck ultrasound findings before and after pregnancy. Demographic and disease-related characteristics and levels of thyroid-stimulating hormone (TSH) during pregnancy had been correlated with disease persistence before conception and disease progression during pregnancy. In their study mean time to the first delivery after completion of thyroid-cancer treatment was 5.08±4.39 years; mean duration of follow up after the first delivery was 4.84±3.80 years. They showed that there was no correlation of disease progression during pregnancy with pathological staging, interval from diagnosis to pregnancy, TSH level during pregnancy, or thyroglobulin level before conception and there was a positive correlation of cancer progression with persistence of thyroid cancer before pregnancy and before total I-131 dose was administered. They concluded that pregnancy does not cause thyroid cancer recurrence in thyroid cancer survivors who have no structural or biochemical evidence of disease persistence at the time of conception. In our study we have relatively shorter mean time to the first delivery after completion of thyroid-cancer treatment (40.5±26.4 months) and shorter mean duration of follow up after the first delivery (2.5±1.4 years).

Yasmeen et al. (2005) evaluated 595 (129 antepartum and 466 postpartum) women with thyroid cancer in a large retrospective study. They concluded that pregnancy had no significant effect on mortality after diagnosis of thyroid cancer and thyroidectomy during pregnancy was not associated with adverse maternal or neonatal outcomes. Additionally Cabezon et al. (2013) analyzed 29 patients who were diagnosed with thyroid cancer during pregnancy and all of the patients gave birth to term and healthy babies. In their study, histological diagnosis, lymph node metastases, tumor size and stage, complications from pregnancy, and thyroid cancer evolution were evaluated. According to their study, surgery may be postponed to the post-delivery period, unless there are risk factors that justify it during pregnancy. Reporting similar results,

Pomorski et al. (2000) investigated 23 thyroid cancer women (19 with papillary cancer and 4 with follicular one) became pregnant. None of them had developed recurrence before, during and after pregnancy. They concluded that it is possible to give birth to a healthy child after thyroidectomy and complementary treatment due to thyroid cancer, and that conception should occur after remission is confirmed and not earlier than 1 year after 131I treatment.

Balenovic et al. (2006) retrospectively analyzed the gestational histories of 76 women treated for thyroid cancer from 1971-2005. The outcome of 49 pregnancies after RAI was: 35 children (72%), 5 (10%) miscarriages and 9 (18%) induced abortions. According to their study, RAI did not adversely affect the rate of successful delivery and live birth demographics. They didn't observe congenital malformation and first year mortality.

Some authors suggest that patients who receive RAI treatment should avoid from being pregnant until one year after RAI treatment. Casara et al. (1993) recommended the patients who receive RAI treatment to avoid from being pregnant until one year after RAI treatment. They evaluated seventy female patients who had been treated with high doses of iodine-131 for thyroid cancer and who had a subsequent pregnancy. In their study, seventy-three children had been followed-up. One child was affected by Fallot's trilogy and three had a low birth weight through with subsequent normal growth; the others were healthy with subsequent normal growth. No newborn with clinical or biochemical thyroid dysfunctions had been found. Two spontaneous abortions during the second month of pregnancy had been recorded. On the basis of these data, they concluded that previous administration of high 131I doses does not appear to be a valid reason for dissuading young female thyroid cancer patients from considering pregnancy. On the other hand they recommended that patients should be advised to avoid pregnancy after 131I administration for at least 1 year to ensure complete elimination of the radionuclide and to permit confirmation of complete disease remission. In our study the duration between diagnosis of thyroid cancer and beginning of pregnancy was 40.5±26.4 (12-120) months and there was no child with birth defect.

We did not detect a change in stage before or after pregnancy. The reason for some studies' suggesting that thyroid cancer negatively affects the prognosis of thyroid cancer may arise from different demographic characteristics or different cancer types. In our study the vast majority of cancer cases were papillary carcinoma.

In conclusion, we didn't found any difference between groups in terms of stage change, recurrence and metastasis between women who had pregnancies that reached term and non-pregnant women in this study comparing the influence of pregnancy on the course of thyroid cancer. In addition, no difference was found in terms of stage, recurrence and metastasis when pregnant women were compared in the periods before and after pregnancy. According to these results, we concluded that pregnancy does not affect the prognosis of thyroid cancer. However regular controls are important for thyroid cancer patients when they are pregnant and this should be emphasized.

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