

Menstrual Abnormality Experienced in Well Differentiated Thyroid Carcinoma Female Patients After Single Dose Radioiodine Therapy – Mono Institute Based Experience

¹ Samira Sharmin, ² Syed Muhammad Baqui Billah, ¹ Hosne Ara Rahman, ¹ Afroza Naznin, ¹ Farida Yasmin, ³ Md.Monir Uddin

¹ Institute of Nuclear Medicine and Allied Sciences, SSMCH, Mitford, Dhaka.

² Sher-e-Bangla Medical College, Barishal

³ District Sadar Hospital, Narsingdi

Correspondence Address: Dr. Samira Sharmin, PMO, INAMS, SSMCH, Mitford, Dhaka. Email: Samira958@gmail.com Mitford, Dhaka.

ABSTRACT

Background: Menstruation is a natural event in all women between puberty and menopause. Radioiodine therapy is the popular method of treatment in Differentiated Thyroid Carcinoma (DTC) worldwide. Considering these two, this study was designed to evaluate the experience of menstrual problems of DTC patients after a single dose of Patients and radioiodine therapy

Patients and Methods: and This retrospective observational study conducted at INMAS, Mitford, Dhaka, analyzed data obtained between January 2020 and December 2023 from 79 female patients with DTC who were referred for radioiodine therapy for their clinical state(s), about 75mci (2.7GBq).

Results: Of the 79 female patients, 12 (15.1%) reported no problem or menstrual abnormality, transient amenorrhea was noticed among 16 (20.6%), oligomenorrhea identified in 12 (15.1%), hypomenorrhea in 13(16.5%), delayed pregnancy in 1 (1.2%), no problem with pregnancy reported by 2 (2.5%), and persistent problem with menstruation before and after therapy was reported by 11 (13.9%) patients after receiving radioiodine therapy. Menopause was reported by 12 (15.1%) during the study period. In this study, mean age of the study subjects were 30.7±5.01 years.

Conclusion: This study reveals that female patients receiving radioiodine therapy had experienced menstrual abnormalities of varying degrees.

Keywords: Well Differentiated Thyroid Carcinoma, Menstrual abnormality, Radioiodine therapy.

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INTRODUCTION

Menstruation is a physiological part of a woman's reproductive cycle that is experienced from puberty until menopause (1). Menstrual irregularities can have a significant impact on women's health and quality of life, including physical, mental, and pregnancy-related health (2).

Differentiated Thyroid Carcinoma (DTC), arising from the thyroid's follicular cells, is the most common type of malignant tumor in the endocrine system. Radioiodine therapy, proven effective and relatively safe, is the most widely used treatment option worldwide in differentiated thyroid carcinoma (DTC). Radioiodine therapy is a worldwide-acceptable method for the treatment of thyroid carcinoma (3). Around the world, thyroid carcinoma is more prevalent in women of different ages, more noticed among the young women (3, 4). As radioiodine therapy is most commonly used for the treatment of the carcinoma thyroid, many of the female patients experience some form of menstrual disturbance (4).

This study was conducted to evaluate the occurrence(s) of menstrual problems among DTC patients after a single dose of radioiodine therapy.

PATIENTS AND METHODS

This retrospective observational study was conducted from January 2020 to December 2023 by enrolling 79 female patients between the ages of 22 and 46 years, with a mean age of 30.7±5.01 years. All the patients underwent total thyroidectomy and rise of THS >30 IU/ml. The study subjects were female patients who had received a single dose of 75 mCi (2.7 GBq) radioiodine therapy for their clinical state. The data were collected from record books and through interviews during follow-up. The data were compiled and analyzed by SPSS 2022.

RESULT

This study was based on data from 79 female patients who received 75 mci of radioiodine therapy, and a majority of

them suffering from some form of menstrual dysfunction such as transient amenorrhea (20.6%), hypomenorrhea (16.5%), oligomenorrhea (15.1%), difficulty getting pregnancy (1.2%) and menopause (15.1%).

Table 1: Characteristics of the study subjects

Clinical status	Follow up data
Study Subjects	79
Mean age	30.7±5.01
Type of carcinoma	Papillary (76) & Follicular (3)
TSH	0.012± 0.011 ml U/L
Thyroglobulin	1.28±0.6 ng/ml
AntiTg antibody	1.28±1.9IU/mL
Whole body iodine scan	Negative

Transient amenorrhea was being experienced by 20.6% of patients with a mean age of about 29.0±4.2 years. The duration of their amenorrhea period was 3.2±1.4 months. Restoration of the normal menstruation time was 2.3±1.4 months without treatment for 9 (56.25%) patients. For 7 (43.75%) other patients, restoration of normal menstruation with treatment took the time of 5.1±1.5 months. Female

patients reported menopause after radioiodine therapy with an age range of 39-46 years and a mean age of 43.1± 2.4 years before therapy and a menopausal mean age of 45.6± 2.5 years after therapy.

A total of 13 (16.5%) patients reported oligomenorrhea, and restoration of normal menstruation took 2.3±1.5 months without treatment (9 in number, 69.23%), and restoration of normal menstruation took 7.6±2.6 months with treatment (4 in number, 30.76%).

A few of the patients (12 in number, 15.1%) experienced oligomenorrhea with a mean age of 28.5±2.5 years. Restoration of normal menstruation time after 5.5±1.8 months was reported without treatment among 7 (58.3%) and restoration in 9.7±2.9 months with treatment among 5 (41.6%) patients.

Regarding pregnancy, (3.7%) female patients conceived after therapy with an age range of 25–36 years and a mean age of 29±4.5 years. Among them, a single patient (1.3%) became pregnant following radioiodine therapy with treatment of 20 months, while two patients (2.5%) conceived

Table 2: Mean age of the study subjects reporting menstrual abnormality

Status	Number (percentage)	Range (y)	Mean age ±SD
No problem with menstruation	12 (15.1%)	24~37y	25.9±4.7yrs
Transient amenorrhea	16 (20.6%)	22~34 y	29.0±4.2 yrs
Hypomenorrhea	13 (16.5%)	26~29y	26.9±1.4yrs
Oligomenorrhea	12 (15.1%)	25~33y	28.5±2.5 yrs
Pregnancy	3 (3.7%)	26~35y	29.6±4.5yrs
Persistent menstrual problem before and after therapy	11 (13.9%)	23-29y	26.1±2.6yrs
Menopause	12 (15.1%)		
a. Before therapy age		39~46y	43.1± 2.4 yrs
b. After therapy menopause age			45.6± 2.5yrs

Regarding pregnancy, (3.7%) female patients conceived after therapy with an age range of 25–36 years and a mean age of 29±4.5 years. Among them, a single patient (1.3%) became pregnant following radioiodine therapy with treatment of 20 months,

while two patients (2.5%) conceived without any treatment after 11±0.7 months.

Few female patients reported persistent problems with menstruation before and after the therapy, having a mean age of 26.1±2.6 yrs.

Table 3: Types of menstrual abnormality with clinical patterns:

Menstrual abnormality							
Transient amenorrhea		Hypomenorrhea		Oligomenorrhea			
Duration of transient amenorrhea	Restoration of normal menstruation	Before therapy duration of menstruation	After therapy of duration of menstruation	Restoration of normal menstruation	Before therapy duration of menstruation	After therapy of duration of menstruation	Restoration of normal menstruation
3.2±1.4 months	2.3±1.4 months without treatment 5.1±1.5 months with treatment	5±2 days	2±1 days	2.3±1.5 months without treatment 7.6±2.6 months with treatment	26±2 days	39±4 days	5.5±1.8 months without treatment 9.7±2.9 months with treatment

without any treatment after 11±0.7 months.

Few female patients reported persistent problems with menstruation before and after the therapy, having a mean age of 26.1±2.6 years.

DISCUSSION

Menstruation is part and parcel of a woman's reproductive system and life. Regular menstruation cycle ensures a woman mental wellbeing as well as physical health and for her to enjoy a normal reproductive life (1,4,5,6).

Thyroid carcinoma is the most common and rapidly rising endocrine malignancy. Thyroid malignancy is most frequent cancer among young adults and more frequently noticed in women than man (7).

A number of prior studies have reported that following the administration of I-131, a significant dose of radiation may reach the ovaries. This may cause the patient to develop abnormalities in the menstrual cycle and/or ovarian insufficiency (5,6,8). In the present study, it was similarly noticed that menstrual cycle abnormalities were present among a majority (84.8%) of the women who received radioiodine therapy for the treatment of the carcinoma thyroid, while on a minor percentage (15.2%) reported no menstrual abnormality.

A study conducted by Rahbari R et al. (2010) reported that thyroid carcinoma noticed in the young female patients were sharply rising at the beginning of the reproductive age (9). Another study by Yaish I et al. (2018), also showed similar results, conducted on women with reproductive age after single dose of radioiodine therapy with mean age of about 34

years and age range 20–45 years (10). The subjects of this study were women having menstrual cycle as well as child bearing age i.e age range was 22~ 46 years with mean age 30.7±5.01 years.

A study conducted by Vini et al. (2002) on 496 women below the age of 40 showed that 12% of the patients experienced menstrual abnormalities comprising hypomenorrhea or changed duration of cycle noted in the first year after RAI. This study also revealed that amenorrhea was noticed in 8% of the patients for a period from four to ten months (11).

Similar findings were observed in this study, which found that 23.8% of patients had transient amenorrhea with mean time 3.2±1.4 months and restoration of the normal menstrual cycle 2.3±1.4 months, whereas oligomenorrhea was noted among 17.9%. This study also reported hypomenorrhea in 19.4% with decreased duration of menstrual time of about 5±2days to 2±1days. Restoration of the normal cycle occurred without treatment in 2.3±1.5 months and with treatment in 7.6±2.6 months.

The impacts of I-131 therapy on gonadal function are an important issue since most the female patients are of reproductive age and many wish to have children (5,6). Pregnancy is one of the main concern of the young carcinoma thyroid patients as they were treated in their most crucial time of life that is reproductive time (6,11). This

study found that 3 patients conceived after radioiodine therapy, with mean age of 29.6 ± 1.5 yrs and range of 26~35 years. A single patient had conceived with treatment after 20 months and two patients conceive after 11 ± 0.7 months without any treatment. A study conducted by Kim et al (2020) showed that (9.7%) women became pregnant after treatment (9.4%) following radioactive iodine therapy (12).

Regarding menopause, this study showed that at the beginning of the therapy mean age of the patients were 43.1 ± 2.4 years and at the end of the study all these patients experienced menopausal state with mean age 45.6 ± 2.5 years which was lower than normal Bangladeshi women menopausal age 46.7 years (13). A study conducted by Sharmin et al. (2023) showed similar findings that the mean menopausal age of the study subjects was 44.1 ± 2.6 years which was lower than normal Bangladeshi women menopausal age (14).

CONCLUSION

This study depicts the prevalence of different types of menstruation abnormalities (and prognosis, from follow up data) experienced by women following radioiodine therapy for the treatment of Differentiated Thyroid Carcinoma (DTC).

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