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ORIGINAL ARTICLE

Prevalence of Sexual Dysfunction in Patient with Subclinical Hypothyroidism and Subclinical Hyperthyroidism

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ABSTRACT

Introduction: Thyroid disease as well as sexual dysfunction is both prevalent disorders that can significantly impact one's quality of life.

Objectives: To determine the prevalence of sexual dysfunction in patient with hypothyroidism and hyperthyroidism.

Study design: Cross sectional study

Settings: Department of Diabetes, Endocrinology and Metabolic Diseases, MTI Hayatabad Medical Complex, Peshawar from December 2022 to May 2023.

Materials & Methods: The study included adult individuals (aged 18 and above) with a confirmed diagnosis of hypothyroidism. Individuals with pre-existing sexual dysfunction unrelated to hypothyroidism, those with comorbidities affecting sexual function (diabetes, cardiovascular diseases), and pregnant or lactating women were excluded. Additionally, individuals unable to complete the required questionnaires or participate in the study procedures were not considered for inclusion. Participants provided demographic details, including age, gender, and relevant medical history. Thyroid function was assessed through serum levels of thyroid-stimulating hormone (TSH), triiodothyronine (T3), and thyroxine (T4). Statistical analysis was performed using SPSS version 22.

Results: The mean age of the participants was 42.5 years, with a standard deviation of 8.2 years. In terms of gender, there were 82 male participants, constituting 65.6% of the total, while 38 participants were female, representing 31.66%. For subclinical hypothyroidism, the levels of FSH were 8.90 ± 4.50 mU/mL, LH was 7.20 ± 3.90 mU/mL, Free Testosterone was 5.60 ± 2.40 pg/mL, and Prolactin was 350.60 ± 75.80 ng/mL. For subclinical hypothyroidism, 78.33% of male patients and 41.66% of female patients were affected. In the case of subclinical hyperthyroidism, 61.66% of male patients and 36.66% of female patients had this condition.

Practical Implication: The study's findings offer actionable insights for policymakers, facilitating informed decisions in healthcare resource allocation. Implementation of these recommendations can enhance patient outcomes and optimize resource utilization effectively.

Conclusion: In conclusion, our study underscores the significant association between subclinical hypothyroidism and sexual dysfunction, aligning with and extending findings from existing literature

Keywords: Subclinical Hypothyroidism, Subclinical Hyperthyroidism, Sexual Dysfunction, Thyroid Disorders

INTRODUCTION

Sexual dysfunction, a multifaceted and often silent health concern, has garnered increasing attention in recent years due to its impact on the overall well-being and quality of life. Among the numerous factors contributing to sexual health issues, an emerging area of research has focused on the intricate relationship between subclinical hypothyroidism, subclinical hyperthyroidism and sexual dysfunction.[1] Subclinical hypothyroidism and subclinical hyperthyroidism represent nuanced thyroid disorders characterized by subtle hormonal imbalances that may not manifest overt clinical symptoms. In subclinical hypothyroidism, the thyroid-stimulating hormone (TSH) levels are elevated, while free thyroxine (T4) levels remain within the normal range.[2] This condition is often asymptomatic, making its detection challenging without routine thyroid function testing. Subclinical hypothyroidism has been associated with adverse cardiovascular outcomes, lipid profile alterations, and a potential risk of progression to overt hypothyroidism, underscoring the importance of early identification and management.[3,4]

Conversely, subclinical hyperthyroidism is marked by low or suppressed TSH levels alongside normal free T4 and triiodothyronine (T3) levels. Like its hypothyroid counterpart, subclinical hyperthyroidism may not exhibit apparent symptoms, but it raises concerns about potential cardiovascular complications, particularly in older adults. The risk of atrial fibrillation and osteoporosis is heightened in this condition, prompting the need for close monitoring and therapeutic intervention when deemed necessary.[5,6] The global prevalence of thyroid disorders ranges from 5% to 10%. Hypothyroidism affects 4.6% of the overall population in the USA, whereas hyperthyroidism affects 1.3%. The percentages in European countries are 3.05% and 0.75%, respectively. In Pakistan, the occurrence of hypothyroidism is 4.1% and hyperthyroidism is 5.1%. Subclinical hyperthyroidism as well as subclinical hypothyroidism is observed at rates of 5.8% and 5.4% respectively.[7,8]

The prevalence of sexual dysfunction in patients with subclinical hypothyroidism and subclinical hyperthyroidism has gained attention as thyroid hormones play a crucial role in reproductive health. Subclinical hypothyroidism, marked by elevated TSH levels, has been linked to sexual dysfunction, including diminished libido and erectile dysfunction. Conversely, subclinical hyperthyroidism, characterized by low or suppressed TSH, may also impact sexual well-being.[9,10]

The exploration of sexual dysfunction in patients with subclinical hypothyroidism and subclinical hyperthyroidism is grounded in the intricate relationship between thyroid function and reproductive health. Thyroid hormones, essential regulators of metabolism and energy, also influence the endocrine system, impacting sexual function. Investigating the prevalence of sexual dysfunction in these subclinical thyroid conditions is essential for understanding the broader implications on patients' quality of life and guiding targeted interventions to enhance sexual health in this population.

MATERIALS AND METHODS

The study received ethical approval from the relevant ethical committee. This study was conducted at Department of Diabetes, Endocrinology and Metabolic Diseases, MTI Hayatabad Medical Complex, Peshawar from December 2022 to May 2023. Participants were provided with detailed information about the study, and written informed consent was obtained. Data were anonymized, and confidentiality of participant information was strictly maintained throughout the study. The estimated sample

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size for our study was 120 patients who were calculated online WHO calculator (www.openepi.com). This sample size ensures an 80% power of the test and a 95% confidence interval, taking into account the expected frequency of sexual dysfunction to be 11.75 in hypothyroid group.

Include individuals aged 18-65 years, diagnosed with subclinical hypothyroidism (elevated TSH levels with normal free T4) or subclinical hyperthyroidism (low or suppressed TSH with normal free T4 and T3). Exclude participants with overt thyroid dysfunction, other endocrine disorders, major psychiatric conditions, or those taking medications affecting sexual function. Confirm subclinical hypothyroidism and subclinical hyperthyroidism through laboratory tests measuring TSH, free T4, and T3 levels. Administer the sexual function assessment tools during structured interviews or through self-administration, ensuring confidentiality and privacy.

Demographic characteristics and thyroid function were summarized using mean, median, standard deviation, and frequency distributions. The frequency of sexual dysfunction was calculated as the proportion of participants reporting impaired sexual function based on questionnaire scores. Correlations between thyroid hormone levels and sexual dysfunction scores were assessed using Pearson or Spearman correlation coefficients, as appropriate.

STUDY RESULTS

Table 1 provides an overview of the demographic details of the included patients. The mean age of the participants was 42.5 years, with a standard deviation of 8.2 years. The majority of patients were in the age group of 15-29 years, comprising 49.6% of the total. Patients aged 30-44 years and 45-60 years were 30.4% and 16.0%, respectively. In terms of gender, there were 82 male participants, constituting 65.6% of the total, while 38 participants were female, representing 31.66%.

The mean FSH levels in subclinical hypothyroidism (8.90 ± 4.50 mU/mL) and subclinical hyperthyroidism (7.70 ± 7.20 mU/mL) were not significantly different (t-test p-value = 0.677). The mean LH levels in subclinical hypothyroidism (7.20 ± 3.90 mU/mL) and subclinical hyperthyroidism (6.75 ± 2.45 mU/mL) were not significantly different (t-test p-value = 0.799). There was a significant difference in mean free testosterone levels between subclinical hypothyroidism (5.60 ± 2.40 pg/mL) and subclinical hyperthyroidism (17.40 ± 97.80 pg/mL) groups (t-test p-value = 0.001*). The mean prolactin levels in subclinical hypothyroidism (350.60 ± 75.80 ng/mL) and subclinical hyperthyroidism (295.80 ± 95.10 ng/mL) were not significantly different (t-test p-value = 0.244). The (0.001*) next to the t-test p-value for Free Testosterone indicates that the difference in mean levels between the two groups is statistically significant at the 0.05 level, suggesting that Free Testosterone levels differ significantly between subclinical hypothyroidism and subclinical hyperthyroidism as given in table 2.

Table 3 presents the results derived from the assessments using the FSFI and BDI questionnaires. In cases of subclinical hypothyroidism, the total FSFI score was 31.29 ± 3.49, whereas in subclinical hyperthyroidism, it was 28.19 ± 3.57, with a statistically significant p-value of 0.000. Similarly, desire, arousal, lubrication, orgasm, satisfaction, and pain scores demonstrated significant differences between the two groups, as evidenced by p-values of 0.000. The Beck Depression Inventory (BDI) scores were 7.79 ± 4.31 for subclinical hypothyroidism and 6.77 ± 6.03 for subclinical hyperthyroidism, with a p-value of 0.068 indicating a borderline significant difference.

Table 3 illustrates the frequency of subclinical hypothyroidism and hyperthyroidism among male and female patients. For subclinical hypothyroidism, 78.33% of male patients and 41.66% of female patients were affected, with a non-significant p-value of 0.64. In the case of subclinical hyperthyroidism, 61.66% of male patients and 36.66% of female patients had this condition, with a non-significant p-value of 0.67.

Table 1: Demographic Details of Included Patients

Variables	Characteristic	Number of Patients	Percentage
Age (Years)	Mean±SD	42.5±8.2	-
	15-29	62	49.6%
	30-44	38	30.4%
	45-60	20	16.0%
Gender	Male	82	65.6%
	Female	38	31.66%

Table 2: Hormone Level of Included Patients

Variable	Subclinical Hypothyroidism	Subclinical Hyperthyroidism	t-test p-value
FSH (mU/mL)	8.90 ± 4.50	7.70 ± 7.20	0.677
LH (mU/mL)	7.20 ± 3.90	6.75 ± 2.45	0.799
Free Testosterone (pg/mL)	5.60 ± 2.40	17.40 ± 97.80	0.001*
Prolactin (ng/mL)	350.60 ±75.80	295.80 ± 95.10	0.244

Table 3: Results Obtained from the FSFI and BDI Questionnaire Assessments.

Variables	Subclinical Hypothyroidism	Subclinical Hyperthyroidism	P value
Total FSFI	31.29 ±3.49	28.19 ± 3.57	0.000
Beck Depression Inventory	7.79 ± 4.31	6.77 ± 6.03	0.068
Desire	5.09 ± 0.63	4.10 ± 0.79	0.000
Arousal	5.26 ± 0.79	4.69 ± 0.97	0.000
Lubrication	5.39 ± 0.49	5.19 ± 0.55	0.000
Orgasm	5.65 ± 0.50	4.81 ± 0.82	0.000
Satisfaction	5.39 ± 0.55	4.53 ± 0.67	0.000
Pain	5.49 ± 0.60	5.30 ± 1.09	0.000

Table 3: Frequency of Subclinical Hypothyroidism & Hyperthyroidism

Thyroid Condition	Male Patients	Female Patients	P-Value
Subclinical Hypothyroidism	47(78.33%)	25(41.66%)	0.64
Subclinical Hyperthyroidism	37 (61.66%)	22 (36.66%)	0.67

DISCUSSION

Sexual dysfunction is a common concern among individuals with thyroid disorders, including both hypothyroidism and hyperthyroidism. Studies indicate a noteworthy prevalence of sexual dysfunction in patients grappling with these thyroid conditions. In hypothyroidism, characterized by an underactive thyroid, individuals may experience challenges such as reduced libido, erectile dysfunction, and other related issues. Conversely, hyperthyroidism, marked by an overactive thyroid, is also associated with an increased likelihood of sexual dysfunction.[11,12]

In our present study, we observed a correlation between sexual dysfunction and Subclinical Hypothyroidism (SCH), consistent with the findings of Krassas et al. (2008) which demonstrated an association between hypothyroidism and sexual dysfunction.[13] The manifestation of sexual dysfunction in SCH appears to be primarily driven by hormonal changes, as evidenced by our results indicating a link between sexual dysfunction and elevated levels of Thyroid-Stimulating Hormone (TSH) in the serum. This aligns with the study conducted by Carani et al. (2005) where an inverse correlation between TSH serum levels and sexual dysfunction was documented.[14]

Our study, revealing that 78.33% of male patients and 41.66% of female patients with subclinical hypothyroidism were affected, aligns with findings from Atis et al. (2010). In their study, Atis et al. explored various parameters in patients with clinical hypothyroidism, including levels of serum TSH, thyroid hormones, prolactin (PRL), free testosterone, and other hormonal markers. Atis et al. noted a significant correlation between hypothyroidism and female sexual dysfunction (FSD), with 56% of patients in the clinic hypothyroidism group experiencing FSD, compared to 15% in the control group (P = 0.006). The mean total FSFI scores also

demonstrated a significant difference among groups, emphasizing the impact of thyroid function on female sexual health.[15]

Our study's findings resonate with various existing literature, shedding light on the intricate relationship between thyroid disorders and sexual function. Pasquali et al. (2013) suggested a hierarchy in sexual dysfunction, with patients having nodular goiter exhibiting the poorest sexual function, followed by those with hyperthyroidism, hypothyroidism, and Hashimoto's thyroiditis, respectively. Our observations align with this trend, particularly noting the impact on sexual function in female patients with subclinical hypothyroidism, further emphasizing the diverse manifestations of sexual dysfunction in thyroid disorders.[16]

Sawicka-Gutaj et al. (2018) highlighted a higher prevalence of sexual dysfunction in female patients with autoimmune thyroid disease compared to those with non-autoimmune diseases. Our study, which identified subclinical hypothyroidism as a contributor to poor sexual function, resonates with Sawicka-Gutaj et al.'s findings and suggests a potential autoimmune origin for the observed impact on sexual health.[17] Bates et al. (2020) emphasized the pivotal role of thyroid disorders in the pathogenesis of sexual dysfunction, especially in women, reinforcing the notion that thyroid antibodies play a significant role in sexual dysfunction. Our study, with its focus on subclinical hypothyroidism and its impact on sexual function, contributes to the growing body of evidence supporting the correlation between thyroid disorders, particularly autoimmune ones, and sexual dysfunction.[18] Furthermore, Luo et al. (2017) and Gabrielson et al. (2019) identified a significant relationship between serum levels of free T3 and sexual dysfunction, with higher levels of fT3 associated with lower FSFI scores. This aligns with our study's emphasis on hormonal changes, particularly the correlation between elevated TSH serum levels and sexual dysfunction in subclinical hypothyroidism.[19,20]

In summary, our study's findings align with and complement existing literature, collectively reinforcing the intricate interplay between thyroid disorders, autoimmune factors, hormonal fluctuations, and sexual dysfunction. These insights provide valuable guidance for clinicians in understanding and addressing the multifaceted aspects of sexual health in individuals with thyroid disorders.

CONCLUSION

In conclusion, our study underscores the significant association between subclinical hypothyroidism and sexual dysfunction, aligning with and extending findings from existing literature. These insights emphasize the importance of comprehensive thyroid evaluation in addressing the nuanced aspects of sexual health in affected individuals.

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