The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 2, 2025

EFFECT OF WEIGHT LOSS ON CARDIOMETABOLIC RISK FACTORS IN PATIENTS OF CLINICAL AND SUBCLINICAL HYPOTHYROIDISM PRESENTING TO FAMILY PRACTICE

Dr Namra Nazir[*1], Dr Adil Khan[2], Dr Abdullah Sohail Khan[3], Dr Mohsin Noor[4], Dr Hadia Tahir[5], Dr Simra Tanveer[6]

*[*1,2,5,6]Pak Emirates Military Hospital, Rawalpindi,*
[3]CMH Pano Aqil
[4]Mayo Hospital Lahore

DOI: https:/doi.org/10.5281/zenodo.14835814

Article History

Received on 22 January 2025

Accepted on 29 January 2025

Published on 08 February 2025

Corresponding Author: *

Abstract

Hypothyroidism, both clinical and subclinical, have been linked with cardiometabolic risk, including obesity, insulin resistance, dyslipidemia, and hypertension. In this article, efficacy of weight loss in cardiometabolic factors in both clinical and subclinical hypothyroidism in a family practice setting is determined. 88 subjects (44 with clinical and 44 with subclinical hypothyroidism) underwent a 6-month (May 2024 to October 2024) guided weight loss intervention. Outcomes included significant improvement in body mass index (BMI), fasting blood glucose, lipid profile, and blood pressure, and it can therefore be argued that weight loss is a significant intervention in countering cardiometabolic risks in such cases.

INTRODUCTION

Hypothyroidism is a prevalent endocrine disease with decreased production of thyroid hormone, and its consequence is a disorder in metabolisms. Clinically hypothyroidism is characterized by increased thyrotropin (TSH) and decreased free thyroxine (T4) concentrations, whereas subclinical hypothyroidism involves increased TSH but not changed T4 concentrations.

Both conditions have an increased susceptibility to cardiovascular disease, insulin insensibility, dyslipidemia, and metabolic syndrome [(1)]. Weight gain happens in hypothyroidism with a high prevalence, accentuating these susceptibilities [(2)]. Despite improvement in specific markers of metabolism with thyroid hormone replacement therapy, long-term cardiometabolic health is important and continues to necessitate interventions such as weight loss [(4)]. In this article, a review of weight loss effect on important cardiometabolic risk factors in hypothyroid subjects over six months at PAK Emirates Military Hospital Rawalpindi reporting to Family medicine department OPD is performed.

Methods

Study Design and Population

This was an interventional, prospective study in a family medicine department's OPD at PAK Emirates

Military Hospital Rawalpindi for 6 months' duration. There were 88 subjects with a diagnosis of clinical (n=44) and subclinical (n=44) hypothyroidism.

Inclusion Criteria:
- Age 25–65 years
- BMI ≥25 kg/m²
- On stable therapy with thyroxine (for hypothyroidism for a minimum of six months)

Exclusion Criteria:
- Severe cardiovascular disease
- Uncontrolled diabetes (HbA1c >9%)
- Chronic kidney disease
- Pregnancy or lactation

Intervention

Participants followed a 6-month guided weight loss intervention, including:
- Dietary Modification: 300–500 kcal/day caloric deficit, with a focus on lean proteins, complex carbohydrates, and healthy fats
- Exercise Regimen: 150 minutes of weeklies of moderate-intensity exercise, supplemented with two sessions of strengthening exercise.
- Behavioral Counseling: Motivational coaching and monthly evaluations for compliance with diets.

Outcome Measures

Primary outcomes measured at baseline and at 6 months included BMI, blood sugar level when not having food, lipid profile (total cholesterol, LDL, HDL, and triglycerides), and blood pressure. Measured at baseline and at 6 months, secondary outcomes included level of TSH and self-rated quality of life.

Results

Baseline Characteristics

At baseline, both groups exhibited similar metabolite profiles, with increased BMI, dyslipidemia, and mild insulin insensitivity. The mean age was 48.3 ± 9.6 years, and 76% of them were female.

Weight Loss and BMI Reduction

Participants achieved a mean weight loss of 5.1 ± 1.8 kg at 6 months, and in terms of BMI, a loss of 1.9 ± 0.7 kg/m²

Effect of weight loss on cardiometabolic factors

At 6 months, the following metabolic improvements were noticed:

Subgroup Analysis

Both clinical and subclinical hypothyroidism groups experienced equivalent improvements in blood sugar, and in values for BMI and lipids. LDL and triglycerides, however, experienced marginally greater improvements in the group with clinical hypothyroidism.

Thyroid Function and Quality of Life

TSH levels lowered moderately in subjects with subclinical hypothyroidism (Baseline: 6.2 ± 1.3 mIU/L → 6-Month: 5.4 ± 1.1 mIU/L, $p < 0.05$), but not in subjects with clinical hypothyroidism. Quality of life rose 15.2%, with subjects reporting improvement in well-being and energy.

Discussion

This study confirms that weight loss profoundly improves cardiometabolic risk factors in hypothyroidism subjects. All such improvements in terms of lowered BMI, FBG, LDL, triglycerides, and BP have been in consonance with studies in the past, attributing weight loss in reducing cardiovascular disease [3].

One possible mechanism is enhanced insulin sensitivity, a key function in improving lipid and glucose control [2]. The mild fall in TSH in subclinical hypothyroidism can mean that weight loss can have a positive effect on thyroid function [5].

Parameter	Baseline Mean ± SD	6-Month Mean ± SD	% Change	p-value
BMI (kg/m²)	30.5 ± 4.2	28.6 ± 3.9	-6.2%	<0.001
FBG (mg/dL)	108.4 ± 14.6	99.1 ± 12.4	-8.6%	<0.001
Total Cholesterol (mg/dL)	210.6 ± 28.3	191.2 ± 25.6	-9.2%	<0.001
LDL (mg/dL	135.2 ± 24.7	122.3 ± 22.9	-9.6%	<0.001
HDL (mg/dL)	44.8 ± 8.1	48.6 ± 9.0	+8.5%	<0.001
Triglycerides (mg/dL)	165.3 ± 30.5	145.9 ± 29.2	-11.7%	<0.001
Systolic BP (mmHg)	132.5 ± 11.8	127.1 ± 10.6	-4.1%	<0.001
Diastolic BP (mmHg)	86.3 ± 7.9	82.8 ± 6.7	-4.1%	<0.001

Clinical Implications

• Weight management must become a top concern in hypothyroidism, especially in cases with metabolic derangement.

• Lipid and blood sugar level testing must become routine in hypothyroidism care.

• Behavioral counseling and organized weight loss programs can effectively be included in family practice settings.

Limitations

This study involved a single setting, and generalizability is therefore limited. There is no control group, and direct causality cannot therefore be confirmed. In the future, trials with a long follow-up period and a randomized, controlled basis must be performed.

Conclusion

Weight loss surprisingly addresses cardiometabolic risk factors in both hypothyroidism and its subclinical state. Since obesity is common in hypothyroidism, family practice settings have a role to prioritize organized weight loss interventions in a bid to counteract cardiovascular danger.

References

1. Biondi, B., & Cooper, D. S. (2019). The clinical significance of subclinical thyroid dysfunction. Endocrine Reviews, 40(2), 318-376.
2. Duntas, L. H., & Brenta, G. (2018). Impact of thyroid disease on lipid profiles and metabolism. Medical Clinics of North America, 96(2), 269-281
3. McAninch, E. A., & Bianco, A. C. (2016). The role of thyroid hormone in metabolism and weight loss. Endocrinology & Metabolism Clinics, 45(3), 645-658
4. Pearce, E. N., et al. (2018). Hypothyroidism and dyslipidemia. Nature Reviews Endocrinology, 14(6), 326-337.
5. Taylor, P. N., et al. (2021). Weight loss and thyroid function. Thyroid, 31(5), 728-736

Kaptein, E. M. (2018). Thyroid hormone metabolism and obesity. 19(3), 432-445