

# Metabolic alterations following growth hormone therapy



**ASSIGN  
BUSTER**

## Evidence Based Research Paper

## Metabolic Alterations Following Growth Hormone Therapy

## Introduction

Turner syndrome is a manifestation of changes brought on by incomplete or missing sex chromosomes. Common clinical manifestations include below average height and abnormal development of reproductive organs. The endocrine changes from this disorder cause health issues to be more common in females with Turner syndrome. These health issues include diabetes mellitus, cardiac disease, and metabolic syndrome. Patients with Turner syndrome are often treated with synthetic hormones to replace those not produced by the patient's body. This medication regimen focuses on retaining optimal body function and maintaining homeostasis. One of these synthetic hormones is recombinant human growth hormone.

## Synopsis

A study conducted by Qi et al. sought to determine how growth hormone therapy impacted patient metabolisms. In total, 45 patients diagnosed with Turner syndrome participated over the course of three years from 2008 until 2011. These patients were pre-screened for specific requirements to be eligible for participation. These requirements included height, delayed physical maturation, infertility secondary to abnormal reproductive development, and bloodwork that shows chromosomal changes specific to the X chromosome. Each participant was tested before initiation of growth hormone treatment. Testing included an oral glucose tolerance test, serum

cholesterols, serum triglycerides, serum proteins, and body composition analysis. After 6 months of prescription treatment with rhGH, the same testing was conducted on each participant. Pre-growth hormone values were compared to values after testing. No significant change was found in oral glucose tolerance testing results after rhGH therapy. Plasma protein levels after growth hormone use were significantly higher than pre-treatment levels. Participant body fat percentage dropped significantly after six months using growth hormone. Total lipid and total cholesterol levels were unaffected by treatment. HDL levels increased significantly, and LDL levels decreased significantly after the use of growth hormone. Over all trends within this study showed that fat percentage decreased, and protein metabolism improved after six months of growth hormone treatment. Carbohydrate metabolism was not significantly changed by growth hormone therapy.

### Clinical Practice Application

Nursing is a career that requires continual learning and adaptation. Even the most experienced nurses need to continually grow as new information and practices are introduced. The research presented in this article helped to broaden my scope of knowledge and provided me with some insights to apply in my clinical practice.

Long-term treatment regimens with any medication have consequences on the patient. This applies to all medications, even if they are formulated to mimic a substance that the body usually produces naturally. These consequences can range from a negligible and barely noticeable effect to a

<https://assignbuster.com/metabolic-alterations-following-growth-hormone-therapy/>

life changing significant effect. While individual actions will vary, research often shows trends of how long-term adherence to a medication regimen will impact a patient's physical, mental, and emotional well-being. This study specifically speaks about the body's physical adaptation to recombinant human growth hormone and the rate at which nutrients are metabolized. Altered metabolism can lead to disease processes such as diabetes, heart disease, and strokes. It is important for me to be armed with the knowledge about each medication that I administer. Teaching about medication purpose and potential side effects should be done before, during, and after medication administration as often as necessary for the patient. Ensuring that the patient taking the medication also understands each medication that they take will help them to remain as safe and healthy as possible during medical treatment.

Nutrition is another key component to a patient's physical health. It is established that excess weight is a significant risk factor in many complications and health problems. Patients with Turner syndrome commonly have a high amount of body fat which can lead to an increase in health problems such as cardiac disease. Patients who demonstrate a nutritionally balanced and healthy diet will have more success in reducing their weight. Losing excess weight will reduce their risk of health problems and complications like cardiac disease. Involving a nutritionist may help patients to better maintain their weight and minimize health complications associated with Turner syndrome.

Puberty is a time of change for all adolescents. Patients who have Turner syndrome experience puberty differently than most. It is important to explain <https://assignbuster.com/metabolic-alterations-following-growth-hormone-therapy/>

to these patients what to expect. Accurate information about medications, treatments, and follow ups can help to increase compliance. Teaching expected changes during adolescence and how they may experience puberty differently from their peers will decrease anxiety that stems from a lack of knowledge. The patient will feel more comfortable and will be better equipped to manage their physical health.

Turner syndrome patients have a higher risk of developing both type I diabetes and type II diabetes than peers without Turner syndrome.

Occurrence of type I diabetes is doubled, and incidence of type II diabetes is quadrupled in patients with Turner syndrome. It is essential to ensure that these patients understand the increased risk they have. Patients should regularly be screened for diabetes and follow up with their primary care physician and endocrinologist. It is also important that they can identify signs and symptoms of diabetes. If they develop any signs or symptoms, these should be reported to their physician.

Turner syndrome can be overwhelming for those diagnosed. The effects go far beyond the physical changes. Short stature and infertility can cause large amounts of depression and emotional turmoil for patients. Nurses can offer encouragement and help the patient to identify their personal support system. Nurses can also act as an advocate to connect the patients with external support groups for people diagnosed with Turner syndrome. These actions will have lasting impacts on the patient's prognosis and how they will live with Turner syndrome.

In conclusion, this study and research article act as a springboard for further information. More studies should be completed with larger participant numbers from areas outside of China. It would also be beneficial to conduct long term studies over the entire course of growth hormone treatment. Often treatment lasts for years, which could change how the treatment physically and emotionally impacts patients. These changes will provide more accurate representation of the effects of growth hormone and allow the best possible treatment plans to be developed for patients.

## References

- Qi, W., Li, S., Shen, Q., Guo, X., & Rong, H. (2014). Effects of recombinant human growth hormone therapy on carbohydrate, lipid and protein metabolisms of children with Turner syndrome. *Pakistan journal of medical sciences* , 30 (4), 731-4.