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Original Research

Evaluation of LDH levels in hypothyroid patients: A biochemical study

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ABSTRACT:

Background: The present study was conducted for assessing lactate dehydrogenase (LDH) levels in hypothyroid patients in Rohilkhand Region. **Materials & methods:**50 hypothyroid patients were enrolled. 50 age and gender matched healthy controls were also enrolled.Complete demographic and clinical details of all the patients was obtained. A Performa was made and complete medical and family history of all the patients was recorded separately. Blood samples were obtained and Thyroid Profileand LDH were evaluated among both healthy controls and hypothyroid patients. **Results:** Mean LDH among patients of hypothyroid group and control group was 312.8 U/L and 513.7 U/L respectively. While comparing the results statistically between hypothyroid group and control group, significant results were obtained. **Conclusion:** Thyroid is affected with alteration in LDH levels.

Key words: Hypothyroid, Lactate dehydrogenase

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INTRODUCTION

Hypothyroidism is one of the most common diseases worldwide, and levothyroxine is the usual medication prescribed to manage it. Hypothyroidism occurs when the thyroid gland, located in the neck, does not produce enough thyroid hormone for the body's requirements. This can result in heart disease, infertility, and poor brain development in children. People with hypothyroidism may have changes in body weight, and feel tired, weak or unhappy, all of which can reduce their quality of life. In underdeveloped parts of the world, the main reason why people develop hypothyroidism is that they not getting enough iodine from food. Thus, many countries try to increase iodine intake by adding iodine to salt.Primary thyroid gland failure can occur as a result of chronic autoimmune thyroiditis, radioactive iodine treatment, or thyroidectomy. Other causes include drug adverse effects (e.g., amiodarone and lithium), transient hypothyroidism due to silent thyroiditis, subacute thyroiditis, or postpartum thyroiditis. $^{1-3}$

Global lactic acid production is estimated to be more than 100,000 tons per year, and approximately 75% of the lactic acid produced is used in the food industry as an acidulant for flavor or as an antimicrobial agent. More recent uses for lactic acid have been driven by ecological interest and include production of the nonchlorinated solvent ethyl lactate and the biodegradable plastic polylactic acid.Lactate dehydrogenase (LDH) is a cytoplasmatic enzyme present in essentially all major organ systems. The extracellular appearance of LDH is used to detect cell damage or cell death. Due to its extraordinarily widespread distribution in the body, serum LDH is abnormal in a host of disorders.⁴⁻⁶Hence; the present study was conducted for assessing LDH levels in hypothyroid patients.

MATERIALS & METHODS

The present study was conducted for assessing LDH levels in hypothyroid patients. 50 hypothyroid patients were enrolled. 50 age and gender matched healthy controls were also enrolled.Complete demographic and clinical details of all the patients was obtained. A Performa was made and complete medical and family history of all the patients was recorded separately. Blood samples were obtained and Thyroid Profile and LDH were evaluated among both healthy controls and hypothyroid patients.All the results were recorded in

Microsoft excel sheet and were subjected to statistical analysis suing SPSS software. Mann-Whitney U test was used for evaluation of level of significance.

RESULTS

Mean age of the patients of the hypothyroid group and control group was 38.4 years and 39.3 years

Table 1: Comparison of variables

LDH	Hypothyroid group	Control group	p- value
Mean	312.8	513.7	0.001*
SD	56.1	14.6	

*: Significant



Graph 1: Comparison of variables

DISCUSSION

Thyroid hormones play a critical role in regulating the function of different systems of the human body respiratory, cardiovascular, including renal. homoeostasis, vascular tone, and central nervous system through their effect on metabolism. Hypothyroidism is a common clinical problem with its prevalence in communities with deficient iodine 1%-2%, and it is ten times higher in women as compared to men. Hypothyroidism has wide range of respiratory consequences ranging from mild dyspnea up to overt respiratory failure. Thyroid function regulates a wide array of metabolic parameters. Thyroid function significantly affects lipoprotein metabolism as well as some cardiovascular disease (CVD) risk factors, thus influencing overall CDV risk.⁷⁻⁹ LDH is an intracellular enzyme and its level is increased in these women due to cellular death. So, serum LDH levels can be used to assess the extent of cellular death and thereby the severity of disease.¹⁰⁻¹² Mean age of the patients of the hypothyroid group and control group was 38.4 years and 39.3 years respectively. Mean LDH among patients of hypothyroid group and control group was 312.8 U/L and 513.7 U/L respectively. While comparing the

results statistically between hypothyroid group and control group, significant results were obtained. McGrowder DA et al determined the activity of lactate deydrogenase (LDH) in thyroid disorders. Elevation of CK activity was found in 5 patients (28%, 5/18) with overt hypothyroidism and in 12 (24.0%, 12/50) patients with subclinical hypothyroidism. The mean CK activity in subclinical hypothyroid patients was 179.80 ± 125.68 U/L compared with 389.901 ± 381.20 U/L in overt hypothyroid patients. The elevation of LDH activity was found in 6 patients (33.3%, 6/18) with overt hypothyroidism and in 37 patients (74.0%, 37/50) with subclinical hypothyroidism. In the hypothyroid patients, a positive correlation was found between CK activity and TSH, and a negative correlation between CK activity and FT4; and between FT4 and TSH.The significant elevation in serum CK and LDH activities indicates that these can be used as parameters for screening hypothyroid patients but not hyperthyroid patients.13

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Burnett JRet al reported three cases of hypothyroidism detected because of unexplained elevation of serum enzyme levels on biochemical testing.Clinical details and serum enzyme results were obtained before and after L-thyroxine (T4) replacement therapy. The three patients all had serum creatine kinase (CK) levels > 2000 U/L, aspartate aminotransferase (AST) > 90 U/L, and lactate dehydrogenase (LD) > 300 U/L at presentation, with these levels being 10-15, 2-6, and 2-3 times the upper reference limits respectively. CK isoenzyme determination was consistent with skeletal muscle origin. Thyroid function tests performed after consultation with the clinical biochemist confirmed the biochemical diagnosis of primary hypothyroidism. A rapid fall toward normal serum enzyme levels occurred in response to T4 replacement therapy. Although serum enzymes are an integral part of both the liver and cardiac profiles provided by laboratory, they are not organ specific, and changes may reflect dysfunction elsewhere in the body. Elevations of serum CK (and other muscle enzymes) may occur in hypothyroid subjects, the cause of which has not been established.14

CONCLUSION

Thyroid is affected with alteration in LDH levels.

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