Relationship between LDH and Mg in Monitoring of Hematological and Non-Hematological Malignant Disease

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Abstract

Magnesium, which is the second most abundant into-cellular cation after potassium, plays a key role in regulating many cellular functions and enzymes, including ion channels, metabolic cycles, and signaling pathways. The proliferation of blast cells occurs when the intracellular Ca/Mg ratio is 3/2.

Background

Aim of this study was to evaluate the correlation between the serum levels of lactate dehydrogenase (LDH) and magnesium (Mg) in patients diagnosed with hematological and non-hematological malignant diseases. Magnesium ion (Mg^{2} +) is critical for maintaining the positional integrity of tightly grouped phosphate groups. Mg^{2} + maintains the integrity of nucleic acids, ribosomes and proteins.

Objective

Serum LDH and Mg levels of patients with newly diagnosed malignant diseases	*Serum LDH and Mg levels of patients in the remission stage of malignant disease following cancer therapy*	*Serum LDH and Mg levels of patients with unfavorable responses to cancer therapy*
Lung Cancer Mean value: LDH = 1270 Mg = 2.85	Lung Cancer Mean value: LDH = 254 Mg = 1.60	Lung Cancer Mean value: LDH = 1330 Mg = 1.26
Breast Cancer Mean value: LDH = 1250 Mg = 2.55	Breast Cancer Mean value: LDH = 250 Mg = 1.80	Breast Cancer Mean value: LDH = 1260 Mg = 0.87
Genital Cancer Mean value: LDH = 1245 Mg = 2.72	Genital Cancer Mean value: LDH = 260 Mg = 1.88	Genital Cancer Mean value: LDH = 1260 Mg = 0.36
Colorectal Cancer Mean value: LDH = 1250 Mg = 2.70	Colorectal Cancer Mean value: LDH = 250 Mg = 1.7	Colorectal Cancer Mean value: LDH = 1260 Mg = 0.63
Acute and Chronic Leukemia Mean value: LDH = 1290 Mg = 3.75	Acute and Chronic Leukemia Mean value: LDH = 255 Mg = 2.05	Acute and Chronic Leukemia Mean value: LDH = 1330 Mg = 1.6

Materials & Methods

Was analyzed a cohort of patients (n = 75) comprising males (n = 36) and females (n =39) with a mean age of 57 years (SD = 12.5) who had cancer diseases and were admitted to the oncology department. The biochemical parameters were measured using a Vitros 250 dry Chemistry Analyzer (Johnson & Johnson, USA) using the slides for multi-layer spectrophotometry measurements.

In the study were excluded patients with non-neoplastic pathologies or diseases that can induce increased serum levels of Mg and LDH. These diseases included acute or chronic renal failure (CRF), ischemic heart disease, lung infarction, liver cirrhosis, acute or chronic hepatitis, massive muscle injury, megaloblastic anemia and severe syndromes that are associated with respiratory failure.

Summary

Normal levels of Mg with moderately increased LDH levels were observed in all patients who had cancer that was in the regression phase following good responses to a specific cancer therapy. Low levels of Mg with high levels of serum LDH were observed in all patients with poor prognosis and metastases.

Discussion

The LDH levels remained elevated after initial cytostatic treatment until cancer remission The serum Mg level is increased via Mg^{2}+ release from malignant tissues in patients with malignant disease prior to treatment with cytostatic drugs..

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[2] Thomas N. Seyfried, Laura M. Shelton, "Cancer as a Metabolic Disease", Nutr Metab, 2010; 7: 7.