



Tikrit Journal of Pure Science

ISSN: 1813 – 1662 (Print) --- E-ISSN: 2415 – 1726 (Online)

Journal Homepage: <http://tjps.tu.edu.iq/index.php/j>



Assessment of Growth Hormone , Insulin and Vit.D2 Levels for Children Suffering from Hypoweight in Kirkuk City

Nuha K. Ibrahim¹, Sahib J. Abdulrahman²

¹ Department of Biology , College of Sciences Tikrit University , Tikrit , Iraq

² Department of Biology , College of Education for Pure Sciences, University of Kirkuk, Kirkuk, Iraq

DOI: <http://dx.doi.org/10.25130/tjps.24.2019.065>

ARTICLE INFO.

Article history:

-Received: 11 / 11 / 2018

-Accepted: 20 / 2 / 2019

-Available online: / / 2019

Keywords: Growth Hormone; Insulin; Vit.D2; Hypo weight children; Kirkuk City.

Corresponding Author:

Name: Nuha K. Ibrahim

E-mail:

Nuhakhalil337@yahoo.com

Tel:

Introduction

The decrease in children weight less than normal weight was a big problem for children health especially in developing countries, we mean here by the severe deficiency of natural and which requires medical intervention[1]. The most important healthiness contests in evolving states is under-nutrition[2]. The insufficiency, deprived sanitation is basic causes of undernutrition and impurities in evolving states [3,4]. Anemia well-thought-out one of the chief predominant nutritional complications in the world [10,15]. Children under five years are principally affected by anemia because encourage and fetal development, correspondingly fundamental times of development of the central nervous system in which biochemical processes ,for example synapse formations and myelin genesis arise[5,6]. This study aimed to investigate some disorders in children suffering from hypoweight in Kirkuk city by estimating the levels of Growth, Insulin hormones and Vit.D2 levels and compared it with normal children.

Materials and Methods

Sample Collection

This study was performed in the Pediatric General Hospital and Al-Azadi Educational Hospital , from period September 2017 to February 2018, it has collected 40 blood samples from children (aged one

ABSTRACT

This study was done in the Pediatric General Hospital and Al-azadi Educational Hospital , the period from September 2017 to February 2018, aimed to evaluate levels of Growth hormone (GH), Insulin and Vit.D3 levels for children suffering from hypoweight aged (1-5)years, include 40 child, in addition to 20 healthy child. A medical syringe was used for collecting blood samples, drawing (5)ml of venous blood from them and put it in test tube free from any coagulation material, it was put in centrifuge (3000rpm, 15min) for purpose obtaining blood serum then serum are separate and drawn by micropipette put it in a test tube used for (Growth Hormone, Insulin and Vit.D) tests. After test complete, the results of study showed a significant decrease ($p \leq 0.01$) in GH, Insulin and Vit.D2 levels.

year to five years) and compare it with 20 samples of children of the same ages as a control group . A medical syringe used for collecting blood samples, pulling (5)ml of venous blood from them ,put it in a test tube free from any material of coagulation and sealing them centrifugation (3000rpm , 15min) for the purpose of obtaining blood serum which used to estimate the levels of Growth, Insulin hormones and Vit.D2 levels.

Estimation of GH Concentration in Serum

GH hormone concentration was estimated in serum by diagnostic kits prepared from fortress company from United kingdom using ELISA technique. According to the [4].

Estimation of Insulin Concentration in Serum

According to the Insulin hormone concentration was estimated in serum by diagnostic kits prepared from IBL company from Hamburg, Germany using ELISA technique. According to the [6 , 11].

Estimation of 25-hydroxy Vit.D2 Concentration in Serum

Serum Vit.D concentration was estimated using diagnostic kits prepared by Germany Immunodiagnostic systems (ids) company by ELISA technology. According to the [9].

Statistical Analysis.

The results of the study were statistically analyzed by using (SPSS) program to find the variables between two groups of study using (t-test) in the levels of probability ($p \leq 0.01$) [14].

Results and Discussion

Growth hormone concentration in patient sera (GH)

The present study result showed (Figure 1) a high significant decrease ($p \leq 0.01$). in GH levels for patients (1.115 ng/ml) when compared with healthy child (4.619 ng/ml). The deficiency of growth hormone may be either inherited such as defective GH or GHRH synthesis or attained (tumor or head injury) [17]. The Growth hormone deficiency risk factors consist of central nerves system radiation or infection, head trauma history, congenital neonates of GH deficiency are a normal size at birth still they may have signs of a shared deficiency of pituitary hormone such as midline structural imperfection, or hypoglycemia. The decreases in GH in children at the time of hypoglycemia are the diagnostic this disorder[6,13].

Normal Value for GH < 7 ng/ml

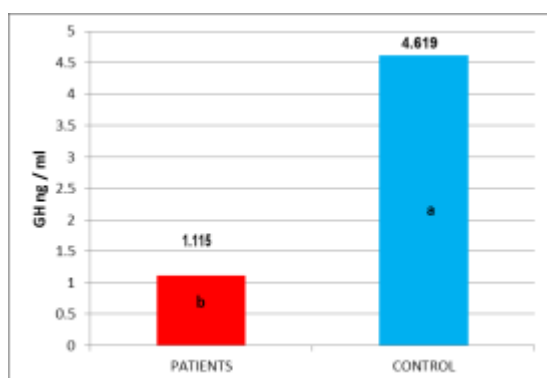


Figure (1) Growth hormone concentration in blood sera

Insulin concentration in patient sera

The present study result showed (Figure2) a high significant decrease ($p \leq 0.01$) in insulin levels for patients group (10.6 U/L) when compared with healthy child (15.82 U/L), several studies have revealed that the incidence of decrease or lack of insulin level, and this loss leads to modulate metabolism irregularities with the result and the high level of blood which leads to the emergence of various pathological disorders mainly neurological disorders[3 , 13].

Normal Value for Insulin (2.6-24.9)mu/ml.

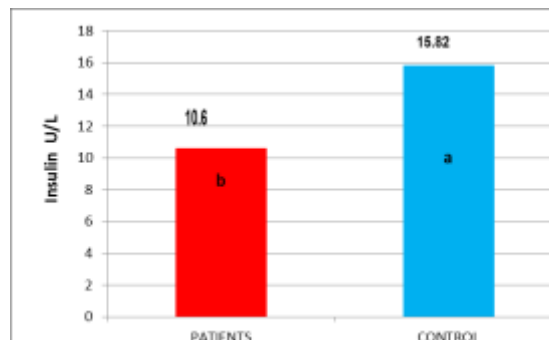


Figure 2: Insulin concentration in blood sera

Vitamin D2 (Vit.D2) concentration in patient sera

The present study result show (Figure 3) a high significant decrease ($p \leq 0.01$) Vit.D2 levels for patients (30.15 ng/ml) when compared with healthy child (45.92ng/ml). Sunlight converts 7-dehydrocholesterol in skin to cholecalciferol (vitamin D3), then enzymes in a liver transforms cholecalciferol to 25-hydroxycholecalciferol [7,11]. Other kidney enzymes transforms 25-hydroxycholecalciferol to calcitriol (1,25-dihydroxycalciferol), the active form of vitamin D, then most of them expelled in bile[17]. Dietary sources: egg yolk, fish-liver oils, fortified milk. Essential for absorption of calcium and phosphorus from GI tract[5]. Works with parathyroid hormone (PTH) to maintain Ca^{2+} homeostasis[6]. Defective utilization of calcium by bones leads to rickets in children and osteomalacia in adults[7]. Possible loss of muscle tone[8,9]. The deficiency of Vit.D3 involvement roughly signs of paresthesia (abnormal or diminished skin sensation), muscle cramps, numbness, laryngospasm, tetany and seizures, while those with slight deficiency may complain from having muscle softness[7,12].

Normal Value for Vit.D2 (30_100) ng/ml

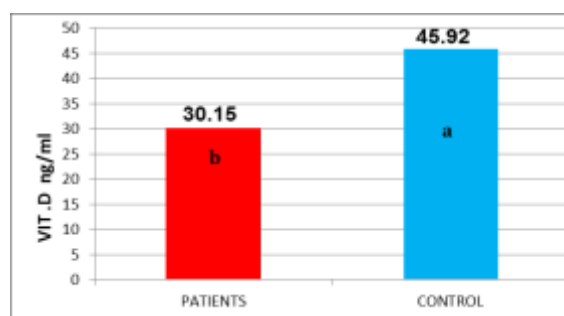


Figure 3: Vitamin D3 concentration in blood sera

References

- [1] Awad, H.R. (2015). Weight losing during birth and psychological problem follow in life. *Mid. west. j* ,52(1):1-5.
- [2] Adias, T.C.; Igwilo, A.C.; Jeremiah and Z.A.(2012). Repeat whole blood donation correlates significantly with reductions in BMI and lipid profiles and increased gamma glutamic transferase (GGT) activity among Nigerian blood donors 4;85-90.
- [3] Anthony, P. F.; Chen, Z.; Chen, and Sergey, A. (2009): In vitro diagnostics in diabetes. Meeting the challenge. *Clin. Chem.*, 45(9):1596- 1601.
- [4] Al-Allan, A.; Sundararajan, K. ; Majid, S. A.; Najee, J. A.; Amal, A.; Iman, S.; Naima, M. A.; Mona, F.; Iqbal, Z. T. and Nasser, M. (2015). Vitamin D deficiency and dyslipidemia in early pregnancy. *J. of Pregnant women*,15:314-322.

- [5] **Bishop, M.**; Kirk, J. and fody, E.(2000). Clinical chemistry 4thed. Lippincot Williams and Wilkins, Philadelphia, USA,12 220-221.
- [6] **Chukwurah, E.F.** and Nneli, R.O. (2005). Prevalence of transfusion transmissible infection disease markers among blood donors in a south Eastern state of Nigeria, *Nigeria Biomedical Science Journal. International Journal of Blood transfusion and Immunohematology*, 7 (43):97-114.
- [7] **Ferreira, T. S.** ; Tatiana, M. R.; Marcie, R. and Antonio, F.S. (2015). Vitamin D deficiency is associated with insulin resistance independent of intracellular calcium, dietary calcium and serum levels of parathyroid hormone, calcitriol and calcium in premenopausal women. *J. Nutr Hosp.*, 31(4):1491-1498
- [8] **Frier, B. M.**, Ashby, J. P.; Nairn, I. M. and Bairs, J.D. (1981). Plasma insulin, C-peptide and glucagon concentrations in patients with insulin-independent diabetes treated with chlorpropamide, *Res. j. of Diab. metab.*, 7(1):45-49.
- [9] **Gallagher, J.C.**; Jindal, P.S. and Smith, L.M. (2014). Vitamin D supplementation in young White and African American women. *J. Bone Miner Res.*, 29(1):173-181.
- [10] **Gerard, J.** ; Tortora, J. B. and Bryan, D. (2014). Metabolism and Nutrition. Principles of Anatomy and Physiology Valencia College 14thed., 25(5):927.
- [11] **Jianhua, S.**; Naixue, C.; Guoping, Z.; Yuexian, A.; Guiju, S.; Sophie, R. Z. and Jianghong, L.(2016). Hemoglobin Status and Externalizing Behavioral Problems in Children. *International Journal of Environmental Research and Public Health*, 2:21-25.
- [12] **Judzewitsch, R. G.** ; Pfeifer, M. A. ; Best, J. D. ; Beard, J. C. ; Halter, J. B. and Porte, D. J. (1982). Chronic Chlorpropamide therapy of noninsulin-dependent diabetes augments basal and stimulated insulin secretion by increasing islet sensitivity to glucose. *J. Clin. End. and Metab.* 55(2):321-328.
- [13] **Kapoor, M.** (2001). Fluid and electrolyte abnormalities. *J. Criti. Care Clin.*, 17(3): 503-529.
- [14] **Laurie, R.**; Braun, R.; Marino,(2017). Disorders of Growth and Stature, 38(7):293-304.
- [15] **Maser R.**; Steenkiste, A. and Dorman, J. (2008). Epidemiological correlates of diabetic neuropathy: report from Pittsburgh Epidemiology of Diabetes Complications Study. *Diabetes*;38:145-148.
- [16] **Murphy, EL**, Schlumpf, K. and Wright, D.J.(2012). BMI and obesity in US blood donors: A potential public health role for the blood center. *Public Health Nutr*, 961-964.
- [17] **Norman, A.W.** and Henry, L. H.(2015). Hormones, 3rd edition. An extracellular glycoprotein involved in bone mineralization and insulin signaling. *Proc. Natl. Acad. Sci. U.S.A*, 109:715-717.

تقييم تراكيز هرموني النمو والانسولين و فيتامين D2 للأطفال الذين يعانون من نقصان الوزن في

مدينة كركوك

نهى خليل أبراهيم¹ ، صاحب جمعة عبدالرحمن²

¹قسم علوم الحياة ، كلية العلوم ، جامعة تكريت ، تكريت ، العراق

²قسم علوم الحياة ، كلية التربية للعلوم الصرفة ، جامعة كركوك ، كركوك ، العراق

الملخص

أجريت هذه الدراسة للفترة من أيلول 2017 لغاية شباط 2018 في مستشفى الأطفال العام ومستشفى أزاوي التعليمي في مدينة كركوك، وهدفت الى تقييم مستوى هرموني النمو (GH) والانسولين Insulin وفيتامين D2 (Vit.D2) لدى الأطفال الذين تراوحت أعمارهم من (1-5) سنة والذين يعانون من انخفاض معدلات الوزن لديهم وتضمنت الدراسة 40 طفلاً بالإضافة الى 20 طفلاً من الأصحاء، واستعملت المحقنة الطبية لتجميع عينات الدم حيث سحبت (5) مل من الدم الوريدي لكل طفل وتم وضعهم في أوعية اختبار خالية من مواد المتخثرة ثم وضعهم في جهاز الطرد المركزي (centrifuge (3000rpm, 15min لمدة 15 دقيقة و 3000 دورة لكل دقيقة لغرض حصول على مصل الدم وتم فصل و سحب مصل الدم باستخدام ممص مكروي ووضعها في انبواب الاختبار لغرض استعمالها في الاختبارات (هرموني النمو والانسولين و Vitamin-D2) وبعد انتهاء الاختبار أظهرت النتائج الدراسة الأنخفاض المعنوي ($p \leq 0.01$) في مستويات هرمون النمو GH والانسولين Insulin وفيتامين Vit.D2 لدى الاطفال المصابين بنقصان الوزن مقارنة مع الاطفال الاصحاء.