



## Effects of vitamin deficiency (A, C and D) in maternal on the weights of newborns

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### Introduction

Vitamin A is needed in small amounts for functioning of the visual system, development, growth, immune function, and reproduction. Vitamin A also plays a role in the production of cell glycoprotein and in the cell division regulation in the intestine [1], which has a bearing on intestinal epithelial renewal during and after acute enteric infections and thereby on the absorption of water, electrolytes and all other nutrients [2]. Vitamin C is a water-soluble, chain-breaking antioxidant capable of scavenging essentially all physiologically relevant free radicals [3]. Humans are unable to synthesize Vitamin C, and must instead acquire it through dietary means [4-5]. Low vitamin D level is an important international public health problem [6-8]. The association between obesity and overweighting and vitamin D deficiency has been reported by many researchers [9-11]. Vitamin D deficiency has relationships with various other diseases. Vitamin D deficiency could affect on the mineralization of their bones [12], attention deficit hyperactivity disorder (ADHD) [13], epilepsy and mental retardation [14], effects on the lung function [15] and allogeneic hematopoietic transplant [16]. So, the aim of present study is the effect of vitamin deficiency (A, C and D) in maternal on the weights of newborns.

### Abstract

The present study was designed to find the relation between vitamin deficiency (A, C and D) of maternal and the weights of newborns. The study used 50 volunteers (40 pregnant women with vitamins deficiency and 10 pregnant women without vitamins deficiency). Pregnant women were divided to two groups according to vitamins state. Newborn weights directly were reported at birth time. Vitamins levels showed decreased in vitamin A, vitamin C and vitamin D in 40 pregnant female and normal in 10 pregnant female. Where, Vitamins levels showed significant decreased ( $P < 0.05$ ) 40 pregnant female compared with 10 normal pregnant female. Also, results show a high correlation between decreased vitamins levels and newborn weights. It was concluded from this study that the vitamins deficiency (A, C and D) in maternal led to decreased the weights of newborn.

### Materials & Methods

50 volunteers (female) were used in this study. 40 pregnant women with vitamins deficiency and 10 pregnant women without vitamins deficiency randomly who referred to Children's Hospital/Kirkuk between Augusts 2016 to December 2016, the range age of all women between (20-35 years).

#### Experimental design

50 volunteers (female) were taken in this study were used and divided to two groups as following:

1. Control group: 10 pregnant women without vitamins deficiency and without any disease.
2. Patients group: 40 pregnant women with vitamins deficiency.

#### Newborn weights

The weights of newborn were directly reported after birth for each group by using special balance to weighing the newborns.

#### Sample Collections for serological analysis

5ml of venous blood samples were obtained from the volunteers at third trimester. All blood samples were transferring into test tubes for clotting. Sera were obtained after samples were centrifuged at 5000 R for 10 minutes and stored until assayed for laboratory investigations.

#### Methods of estimation of vitamins

Measurement of serum Vitamins were done by the procedure of Biovision-USA kits using Minividas technic that including put drop of serum on strip and read after 10 min this done according to the company procedure of kit.

#### Statistical analysis

Data were analyzed using a statistical Minitab program, using Analysis of Variance (ANOVA) test,

in order to evaluate the significance of variability between treated and control groups [17].

#### Results

##### Newborn weights

The weights of newborn and all characterized were reported at the birth as shown in table (1).

Table (1): Characterized of newborns

Characterized \ Groups	Newborns of maternal with vitamins deficiency (40N)	Newborns of maternal without vitamins deficiency (10N)
Weights	2.627 ± 0.404 b	3.27 ± 0.389 a
Diseases	Nil	Nil
Morphological abnormalities	Nil	Nil
Sex percent %	Female 63%, Male 37%	Female 70%, Male 30%

##### Vitamins (A, C and D) levels

Vitamin A in patients group ( $22.75 \pm 3.19$ ) show significant decreased ( $P < 0.05$ ) compared with control group ( $49.44 \pm 4.55$ ). Vitamin C in patients group ( $0.88 \pm 0.27$ ) show significant decreased ( $P < 0.05$ ) compared with control group ( $1.6 \pm 0.253$ ). Vitamin A in patients group ( $11.47 \pm 2.89$ ) show significant decreased ( $P < 0.05$ ) compared with control group ( $20.95 \pm 3.11$ ) as shown in table (2).

Table (2): The levels of vitamin A, C and D

Vitamins \ Groups	Control group	Patients group
Vitamin A (mg/dl)	$49.44 \pm 4.55$ a	$22.75 \pm 3.19$ b
Vitamin C (mg/dl)	$1.6 \pm 0.253$ a	$0.88 \pm 0.27$ b
Vitamin D (mg/dl)	$20.95 \pm 3.11$ a	$11.47 \pm 2.89$ b

##### Correlation between newborn weights and vitamin deficiency

The results show a high correlation between vitamins deficiency and newborn weights. Where, newborns of maternal with vitamin A deficiency show decreased in their weights ( $2.74 \pm 0.643$ ) compare with newborns of maternal without vitamin A deficiency ( $3.29 \pm 0.582$ ) as shown in figure (1). Newborns of maternal with vitamin C deficiency show decreased in their weights ( $2.68 \pm 0.385$ ) compare with newborns of maternal without vitamin C deficiency ( $3.25 \pm 0.403$ ) as shown in figure (2). Newborns of maternal with vitamin C deficiency show decreased in their weights ( $2.58 \pm 0.607$ ) compare with newborns of maternal without vitamin C deficiency ( $3.32 \pm 0.439$ ) as shown in figure (3).

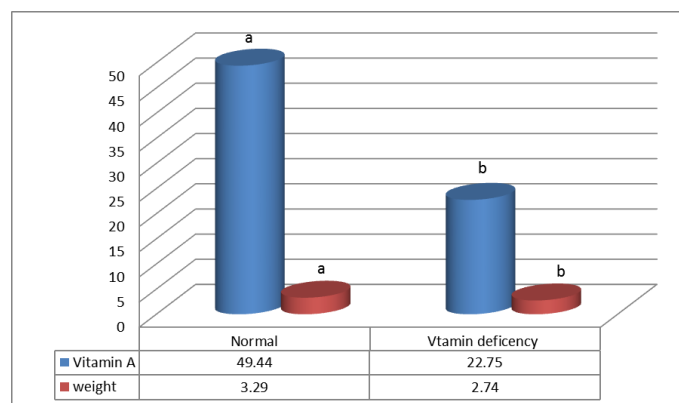


Figure (1): correlation between levels of vitamin A of maternal with newborns weights.

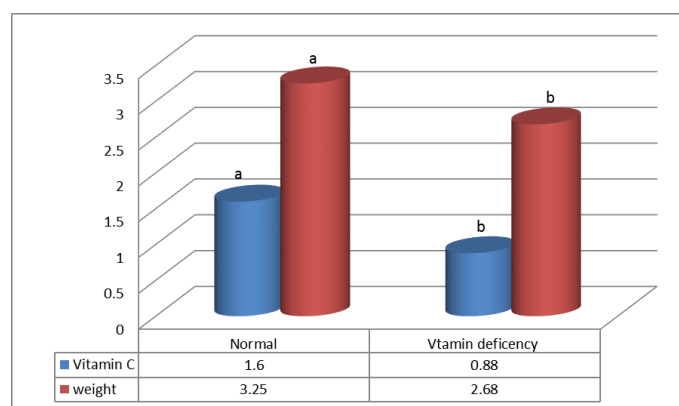


Figure (2): correlation between levels of vitamin C of maternal with newborns weights.

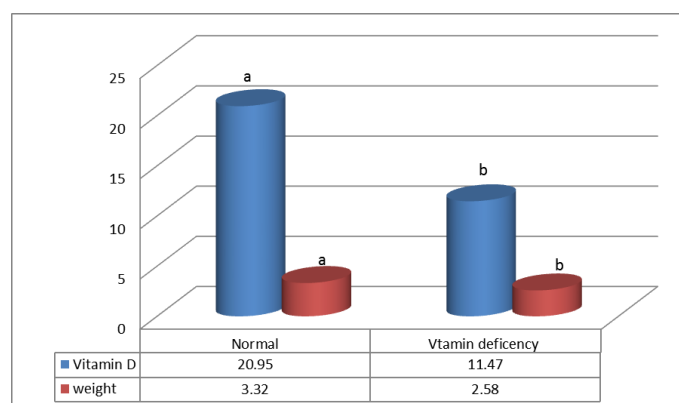


Figure (3): correlation between levels of vitamin D of maternal with newborns weights.

## Discussion

The results of present study show a correlation between vitamins deficiency and decreased in weights of newborn. Rotondi and Khobzi (2010) referred that the relation between the prevalence of vitamin A deficiency in pregnant and the effect of neonatal vitamin A supplementation on infant mortality [18]. Rondò et al. (2001) referred that the Concentrations of vitamin A in cord blood correlated significantly with birth weight and length [19]. Also, Tolba et al. (1998) referred that a high correlation between birth weights and vitamin A. they found the increasing birth weight occur with increasing cord plasma vitamin A, and decreasing birth weight occur

with decreasing cord plasma vitamin A [20], that is in agreement with the present results.

According to the present study, vitamin C has a positive correlation with the newborn weights. Mathews et al. (1999) referred that a high correlation between birth weights and vitamin C [21]. Also, present results show decreased the vitamin D levels during pregnancy period. Katzman (2012) indicated that low weight gain during pregnancy is significantly associated with low vitamin D levels [22]. Fallahi et al. (2016) referred that the high correlation between the vitamins D levels in maternal and Infant's vitamin D levels. Also, they found no significant relationship between low birth weight and mothers' vitamin D level [23].

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## تأثير نقص الفيتامينات (A, C و D) في الامهات الحوامل على اوزان حديثي الولادة

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المعهد التقني الدور ،

### الملخص

صممت الدراسة الحالية لايجاد العلاقة بين نقص الفيتامينات (A, C و D) في النساء الحوامل واوزان حديثي الولادة. استخدمت الدراسة 50 متطوعة (40) انثى حامل تعاني من نقص الفيتامينات و 10 نساء حوامل وبدون نقص في الفيتامينات). بعدها قسمت النساء الحوامل الى مجموعتين اعتمادا على حالة الفيتامينات. اوزان حديثي الولادة سجل مباشرة بعد الولادة. مستويات الفيتامينات اظهرت انخفاض في مستوى فيتامين A وفيتامين C وفيتامين D في 40 انثى حامل وكانت مستويات الفيتامينات طبيعية في 10 نساء حوامل. حيث اظهرت مستويات الفيتامينات انخفاض معنوي ( $P < 0.05$ ) في 40 امرأة مقارنة مع 10 نساء طبيعيات. ايضا اظهرت النتائج وجود علاقة قوية بين انخفاض مستويات الفيتامينات واوزان حديثي الولادة. يستنتج من هذه الدراسة بان نقص الفيتامينات (A, C و D) في الاناث الحوامل يؤدي الى انخفاض اوزان حديثي الولادة.

**الكلمات المفتاحية:** فيتامين A: فيتامين C: فيتامين D: اوزان حديثي الولادة.