



## Estimation of vitamin d3 and ferritin in pregnant woman and relationship with hair loss

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### Abstract

The current study was designed to verify the relation between level of serum both vitamin D3 and serum ferritin in pregnant women in study group on Tikrit Hospital and hair loss in first and second trimester of pregnancy. To achieve this aim, take 50 pregnant in first and second trimester with hair loss and other group 30 women pregnant without hair loss them aged between 22 and 38 years. Serum vitamin D3, ferritin, white blood count and platelets count will be measured in all group in this study we found the level of vitamin D3 well decreased in women with hair loss and ferritin level found low in this women during first and second trimester while the other group with no hair loss there is normal level of both vitamin D3 and serum ferritin. And other factors such as white blood cell and platelet not related to hair loss but all changes due to physiology of pregnancy.

**Keywords:** vitamin D3, ferritin, hair loss

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### INTRODUCTION

Pregnancy is normal physiological process during it many changes appear in the blood of pregnant women. Most of these changes effect on hair, nail, vision, heart, and other oranges in the body. During pregnancy many serological changes that occur due to embryological development .When the embryo develop this lead to decrease level of vitamins and minerals such as vitamin D3 and serum ferritin and this changes has many effect on body structure such as hair (Barrett et al., 2019). During pregnancy the fetus well develop and grow this need increase requirement of many vitamins and minerals for pregnant women (Singh et al., 2011). The chemical changes during pregnancy lead to decrease level of iron and vitamin D3. Low level of iron during pregnancy lead to growth retardation and fetal defect (Lone et al., 2004). Iron is essential for oxygen transport and inter in DNA structure and act as antioxidant. Vitamin D3 is essential for calcium absorption from intestine and it is important for growth of fetal bone during embryonic life, vitamin D3 deficiency related to many daises in neon eat such as bone fracture in fetus (Tomashek et al., 2006). Vitamin D3 level in new neat depend on pregnant vitamin level so the lactated child from women with low level vitamin have a risk to low vitamin B6 (Gale et al., 2008). Low level of vitamin D3 in pregnant women have bad effects on all trimester of pregnancy such as preterm labor, hair loss, and pulmonary function defect in her baby (Bodnar et al.,

2007). Decrease in the level of vitamin D3 after delivery while cause excessive hair loss and more complication in bone (Bodnar et al., 2014). Vitamin D3 deficiency can lead to hair loss .one of role vitamin D3 plays in stimulating new and old hair follicles when there is not enough vitamin D in your system, new hair can be stunted. Low level of serum ferritin during and after pregnancy can lead to many complication in all the body system (Mirzakhani et al., 2017). Such as hair loss, on heart, nail and muscle (Akkoca et al., 2014). Iron deficiency during pregnancy can lead to done have enough red blood cells to get oxygen to different tissues in body. It causes hair thinning (Bregy and Trüeb, 2008; Rostami et al., 2015). Aim of this study is study the direct and in direct effect of low level of both vitamin D3 and serum ferritin in pregnant women in first and second trimester of pregnancy (Sobouti et al 2020)

### MATERIALS AND METHOD

In this study take 50 pregnant women in first and second trimester and 30 non pregnant women the of all women in study between 22 and 38 years. The sample of these women collected from the Tikrit Hospital - Gynecological Department. And take the sample 5ml of blood and dived to tow group one putted in tube with

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**Table 1.** Relationship some biological variables with hair loss in pregnant women and control group of pregnant women who do not have hair loss

Parameters	Groups	Control without hair loss Mean± SD	Control with hair loss Mean ± SD	P- value
Pregnant period (Month)		4.0000 ± 1.69967	3.6897 ± 1.62796	0.05*
Vitamin D (ng/mL)>30		30.5000 ± 5.81053	12.1314 ± 6.06972	0.05*
Ferritin (ng/mL)20-200		25.4600 ± 9.47877	11.6586 ± 2.53638	0.05*
Hb (g/dl)11-16		11.4000 ± 1.02089	10.5724 ± 1.49640	0.05*
WBC (*103)/µl		7.2400 ± 1.47136	8.4276 ± 3.40146	0.05*
PLT *103)/µl		182.4000 ± 62.88473	221.4483 ± 54.07969	0.05*

**Table 2.** Relationship correlation of pregnant women with hair loss

parameters	Pregnant period (Month)	Vitamin D3 (ng/mL)>30	Ferritin (ng/mL) (20-200)	Hb (g/dl) (11-16)	WBC (*103)/µl	PLT (*103)/µl
Pregnant period (Month)	1	-.375*	.271	.161	-.060	.186
Vitamin D3 (ng/mL)>30	-.375*	1	-.095	.005	-.022	-.125
Ferritin (ng/mL)20-200	.271	-.095	1	.387*	.286	-.152
Hb (g/dl)11-16	.161	.005	.387*	1	-.086	-.093
WBC (*103)/µl	-.060	-.022	.286	-.086	1	-.055
PLT (*103)/µl	.186	-.125	-.152	-.093	-.055	1

\* . Correlation is significant at the 0.05 level (2-tailed).

**Table 3.** Relationship of biological variables of pregnant women who do not have hair loss

parameters	Pregnant period (Month)	Vitamin D3 (ng/mL)>30	Ferritin (ng/mL) 20-200	Hb (g/dl) 11-16	WBC (*103)/µl	PLT (*103)/µl
Pregnant period (Month)	1	-.646*	-.130	-.474	.342	-.352
VitaminD3 (ng/mL)>30	-.646*	1	.395	.810**	-.487	-.046
Ferritin (ng/mL)20-200	-.130	.395	1	.472	.197	.239
Hb (g/dl) 11-16	-.474	.810**	.472	1	-.186	.336
WBC (*103)/µl	.342	-.487	.197	-.186	1	.267
PLT (*103)/µl	-.352	-.046	.239	.336	.267	1

\* . Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

anticoagulant [EDTA] to estimate [Hb. WBC.PLT]. The second part of blood putted in plastic tube without anticoagulant to estimate [Ferritin. vitamin D3] In [BIOLABO] By used ELISA Kit.

## STATISTICAL ANALYSIS

Statistical analysis was performed using the SPSS system, used T-test to calculate the sample and use Chi-square to compare non digital for value and the P- value is less than 0.05.

## RESULTS

In the study, the results showed a significant decrease ( $p \leq 0.05$ ) in vitamin D3, ferritin, Hb ( $12.1314 \pm 6.06972$ ), ( $11.6586 \pm 2.53638$ ), ( $10.5724 \pm 1.49640$ ), respectively in pregnant women who had hair loss compared with women Of pregnant women without hair loss ( $30.5000 \pm 5.81053$ ), ( $25.4600 \pm 9.47877$ ), ( $11.4000 \pm 1.02089$ ), respectively, and a significant increase in WBC, PLT ( $8.4276 \pm 3.40146$ ) and ( $221.4483 \pm 54.07969$ ) Had hair loss compared with pregnant women who had no hair loss ( $7.2400 \pm 1.47136$ ), ( $182.4000 \pm 62.88473$ ), respectively (**Table 1**). The results showed there was a negative correlation (for pregnant women with hair loss) between vitamin D3 and WBC (PLT) and positive correlation between vitamin D3 and Hb (**Table 2**). The results showed that there was a positive correlation between pregnant

women with no hair loss between vitamin D3 and Hb and a negative relationship between vitamin D3 and WBC (**Table 3**).

## DISCUSSION

During the first and second trimester ,pregnant women are high vulnerable to iron deficiency anaemia .Low serum ferritin was mainly due to iron requirement along with expansion of blood volume are greater than at other times to maintain maternal tissues ,placental and fetal need. Most of pregnant women develop decrease in vitaminD3 level either because of type of diet or clothes, or used sunscreen (Rostami et al., 2015; Khosravi and Entekhabi, 2016). And air pollution and colour of skin act as factor that effect on vitamin D3 absorption because the sun light activate the vitamin D3.Vitamin D3 is important for growth of hair follicles and produce the antigen to develop the follicles and reach to final stage (Kelishadi et al., 2014; Feizabad et al., 2017). So low vitamin D3 level lead to defect in hair follicles and increase the rate of loos and decrease the rat of grow and development (Zheng et al., 2001; Shao et al., 2012). Vitamin D3 deficiency has linked with alopecia, the autoimmune condition that cause blade and patches on the scalp and other areas of the body (Angham G et al., 2019). Reasons for insufficient vitamin D3 level include spending more time indoor and not eating foods packed with the nutrient due to nausea in pregnancy (Waikel et

al., 2001). Low intake of vitamin D3 and increase requirement during pregnancy lead to decrease level in serum of pregnant women and all the complication start occur. Iron deficiency are common in pregnancy because of increase need for iron to transport of oxygen to different tissue during intra-uterine life so any decrease in level of ferritin lead to low oxygenation of tissue and hair follicles that lead to thinning of hair and loss. Low serum ferritin can lead to more complication such as low birth weight (Tabrizi and Barjasteh, 2015; Akinlaja, 2016), fetal distress .In this study there is increase in the level of white blood cell this due to increase energy requirement for pregnancy and labour (Akinlaja, 2016; Chandra et al., 2012). There is many cause for increase white blood cell such as stress and nausea and vomiting (Kaur et al., 2014; Everly and Lating, 1989). During pregnancy many haematological changes in serum of pregnant women such as increase

in clotting factor and platelet count (Karpatkin, 1969). Increase in level of platelet due to changes in heart rate and cardiac output these changes happened normal in each pregnancy but many disease many aggravate these changes (Juan et al., 2011). In this study we found strong correlation between level of vitamin D3 and serum ferritin and loss of hair in pregnant women in group of study.

## CONCLUSION

In this study we found the level of Vitamin D3 well decreased in women with hair loss and ferritin level found low in this women during first and second trimester while the other group with no hair loss there is normal level of both Vitamin D3, serum ferritin and other factors such as white blood cell and platelet not related to hair loss but all changes due to physiology of pregnancy.

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