

Evaluation of Serum Magnesium, Hemoglobin and body mass index in Dysmenorrheic Women in Tikrit City /Iraq

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Abstract

This study was conducted to evaluate serum magnesium, hemoglobin level and body mass index of 60 primary dysmenorrheic women and 60 control attended to emergency department / teaching Tikrit hospital in Tikrit city. Blood samples were collected from groups from July / 2011 to the October / 2011. Their ages varied between 14-25 years.

The results showed that serum magnesium level of primary dysmenorrhea women was significantly ($P < 0.05$) lower than in the control group which was 0.98 ± 0.18 , 1.82 ± 0.21 mmol/l respectively. Also the mean of the serum hemoglobin in dysmenorrhea women was significantly ($P < 0.05$) lower than the control group which was 9.31 ± 0.81 g/dl, 12.32 ± 0.94 g/dl, respectively. The results showed that body mass index in dysmenorrhea women was significantly ($P < 0.05$) lower when compared with control group which was 17.4 ± 1.02 kg/m², 19.77 ± 1.6 kg/m² respectively.

Introduction

Dysmenorrhea, one of the most frequently encountered gynecologic disorders among female adolescents, refers to painful menstruation.

Dysmenorrhea is classified as primary and secondary dysmenorrhea. Primary dysmenorrhea menstrual pain occurs in the absence of underlying pelvic pathology and this thought to be related to the release of prostaglandins particularly PGF₂- α during menstruation, which can cause excessive uterine contractions and subsequent ischemia (1,2,3). It occurs more frequently in un married women than in married women, and decreases with age (4). Secondary dysmenorrhea is caused by pelvic disease, such as endometriosis, uterine fibroids, pelvic inflammatory disease, pelvic adhesions, and cervical stenosis. The pain of secondary dysmenorrhea usually begins earlier in the menstrual cycle and continues beyond the end of menses. Further symptoms may be present depending on the underlying pathology (5). Magnesium is an essential nutrient mineral that the body needs it for healthy functioning, magnesium activating over 300 different biochemical reaction in the body all necessary for our body to function properly (6). Magnesium also has important role in dysmenorrhea (7, 8, 9). Magnesium deficiency can mimic many other disorder these include fatigue, irritability, weakness and dysmenorrhea (10, 11). An often overlooked factor that may contribute to menstrual irregularities is anemia (12) Chronic anemia can be present at a sub-clinical level that is why it is not always considered as a contributing factor of DUB (dysmenorrheal and dysfunctional uterine bleeding). At any level of anemia, the impaired oxygen and nutrient carrying capacity can have a dramatic effect on tissues throughout the body, especially reproductive tissues. Because these tissues are susceptible to an even mild anemic state is the result of their function being dependent upon hormonal messages communicated from the neuro endocrine system through the blood to the target tissue (13, 14,15). Another factor that found to be associated with menstrual cramps from this study is

body mass index (BMI). The prevalence of menstrual pain among young women was very high in the under weight group (BMI < 19) given the current trend for young women to wish to be thin. In women 14 to 20 years of age attempts to lose weight are associated with increase menstrual pain independent of body mass index (16,17).

The aim of this study is to evaluate the changes in serum magnesium and hemoglobin levels and BMI in primary dysmenorrheic women.

Materials and Methods:-

Two groups of patients were enrolled in this study. Group 1 consisted of 60 dysmenorrheal women; group 2 consisted of 60 control women. Their ages were (14-25) years. Patients were previously diagnosed by physicians. They attended for emergency department to Teaching Tikrit hospital in Tikrit city / Iraq. Blood samples were collected from both groups and centrifuged for 15 minutes at 3000 rpm and the serum was separated and stored at 4°C for analysis.

Biochemical Assay:-

1. Determination of serum magnesium

Serum magnesium level was assayed according to the kit and Khayam- bashi method (18)

2. Hemoglobin estimation:

Hemoglobin was calculated indirectly by using the Power, (19). $Hb = Pcv/3.3$

Statistical analysis:

The results were expressed as mean \pm SD. Students t-test was used to compare differences in means between 2 groups, a P value less than 0.05 is regarded as statistically significant (20).

Results

Serum magnesium level was evaluated in the dysmenorrheal and normal women. The mean of serum magnesium in dysmenorrheic women was significantly ($p < 0.05$), lower than the control group, which was 0.98 ± 0.18 , 1.82 ± 0.21 mmol/l as shown in figure 1.

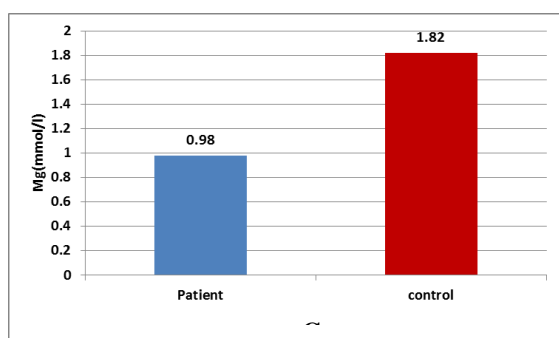


Figure (1): Level of magnesium in dysmenorrhic and normal women

Also results in figure 2 showed that the mean of serum hemoglobin value in dysmenorrhic women (9.31 ± 0.81) g/dl was significantly ($p < 0.05$) lower than control group which was (12.32 ± 0.94) g/dl.

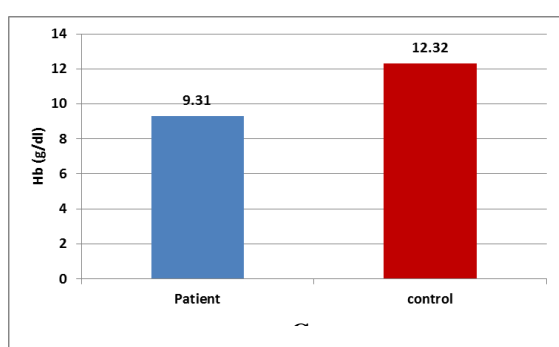


Figure (2): Level of Hemoglobin in dysmenorrhic and normal women

The body mass index was measured in this study, the results indicated that the mean of body mass index in dysmenorrhic group was significantly lower ($p < 0.05$) than in control group which was 17.4 ± 1.02 , 19.77 ± 1.6 kg/m² respectively, as showed in figure 3.

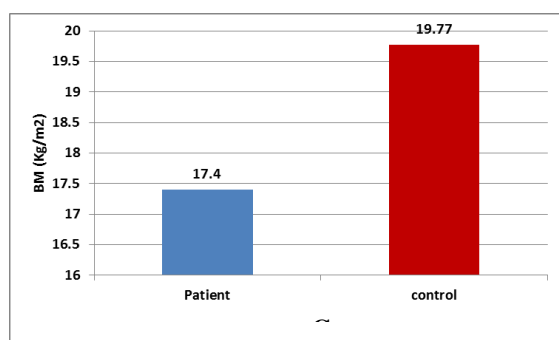


Figure (3): Body mass index level in dysmenorrhic and normal women

Discussion

Evidence suggests that most women with primary dysmenorrhea have increased or abnormal uterine

prostanoid production and release, giving rise to abnormal uterine activity and therefore to pain (21,22). In women with primary dysmenorrhea, the endometrial tissues are capable of increased production and the release of prostaglandins during menstruation were the first to quantify prostaglandins in menstrual fluid and demonstrate that dysmenorrheal women produce 8–13 times more prostaglandin F than do non-dysmenorrheic women (23,24). Magnesium influences the contractility, tone and relaxation of the uterine smooth muscle; and may inhibit the synthesis of prostaglandin alpha. Mg based on inhibition of biosynthesis of prostaglandin (25). This study showed that magnesium level in primary dysmenorrheal group was lower than control women this is in accordance with (26, 27, 28). Study also the mean values of hemoglobin in dysmenorrhic women were significantly lower than normal women. Anemia can not only be the cause of excessive uterine bleeding, but can also be the result (29, 30). The anemia can then aggravate menorrhagia by impairing the delivery of nutrients and oxygen required to repair and oxygenate the reproductive tissues (31, 32). Recurrent bleeding per cycles results in anemia (33). Anemia can also be nutritional in origin and can result from insufficient dietary iron, vitamin B12, folic acid, vitamin C, vitamin B6, and vitamin E, which all play a role in the uptake and metabolism of iron and the formation of healthy red blood cells (30, 31, 32, 33, 34, 35). Another factor that found to be associated with menstrual cramps from this study is body mass index. BMI is associated with increased risk of primary dysmenorrhea (16). Results of this study showed that significantly lower ($p < 0.05$) of BMI in dysmenorrhic women when compared with control women and this is in accordance with Koebnick et al (36). and Fujiwawa (37). The primary dysmenorrheal attempting to lose weight was significantly associated with increased menstrual pain (17). It is well known that in appropriate dieting often induces amenorrhea in young women and may cause ovarian dysfunction during subsequent reproductive years (38). Also observed that diet during adolescence has long lasting adverse effects (37). Many female adolescents suffer menstrual pain and their daily activities are often adversely affected it is therefore necessary to clarify what factors are associated with menstrual pain in order to assist in improving their quality of life (QOL) (16).

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تقييم المغنيسيوم وهيموكلوبين المصل ومعامل أكتله الحيوية في النساء المصابات بعسر الطمث الأولي في مدينة تكريت / العراق

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الملخص

تضمنت الدراسة تقييم مستوى المغنيسيوم والهيموكلوبين في مصل 60 امرأة مصابة بعسر الطمث الأولي و60 امرأة كمجموعة ضابطة في قسم الطوارئ/ مستشفى تكريت التعليمي في مدينة تكريت وكذلك تضمنت الدراسة تقييم معامل الكتلة الحيوية للجسم. تم جمع عينات الدم من كلا المجموعتين للفترة ما بين شهر تموز 2011 لغاية شهر كانون الأول 2011 وتراوحت اعمارهن ما بين 14-25 سنة اشارت نتائج الدراسة الحالية الى ان مستوى المغنيسيوم في مصل النساء المصابات بعسر الطمث الاولي انخفض ($P < 0.05$) معنويا عن المجموعة الضابطة اذ بلغ 0,98 ملي مول/لتر و 1,82 ملي مول / لتر على التوالي. وانخفاض معدل قيم الهيموكلوبين معنويا في مصل النساء المصابات بعسر الطمث الاولي مقارنة مع مجموعة السيطرة وكانت 9,31 غم /100مل و 12,32 غم/100مل على التوالي. اشارت النتائج ايضا الى انخفاض معامل الكتلة الحيوية للنساء المصابات بعسر الطمث الاولي معنويا مقارنة مع نساء السيطرة وكانت 17,4 كغم/2م و 19,77 كغم/2م على التوالي.