



Influence of the Combined Oral and Injectable Contraceptives on the Level of Creatinine, Urea, and Some Electrolyte

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Abstract

This study was conducted to investigate the effect of combined oral contraceptives and injectable contraceptives on the Urea, Creatinine, Sodium and Potassium level. The study included 40 women used hormonal contraceptives who attending the family center of planning at the feminine and children hospital in Al- Muthanna Governorate. They were divided into two groups (combined oral contraceptives group and injectable contraceptives group) and were compared with control group (20 women do not use of contraceptives). The blood samples were collected to determine of serum Urea, Creatinine, Sodium and Potassium level. The results showed no significant differences in the level of Urea, Sodium and Potassium between the three study groups, while Creatinine showed a significant increase (0.01) in combined oral contraceptives group compared with injectable contraceptives and control groups. In conclusion, combined oral contraceptives and injectable contraceptives did not affect the level of Urea, Sodium and Potassium, except Creatinine, showed significant increase in women who used Compound oral contraceptives group.

Keywords: *Combined oral contraceptives, Injectable contraceptives, Serum electrolytes, Urea, Creatinine.*

Introduction

Hormonal contraceptives are drugs that play a vital role in the lives of many married couples and used in order to control the increase of births [1] or reducing undesirable pregnancies [2]. Where the proportion of undesirable pregnancies among women in reproductive age 51% and the rate of unwanted pregnancy that lead to abortion up to 65% [3]. Worldwide, contraception has been common, in 2007; the proportion of women in ages between 15 - 49 which used contraceptives pills up to 9% and the proportion of women used contraceptives injectable or transplant about 4% [4].

It was suggested that use of contraceptives were useful [5], but also have some risks on health. These risks include increase in disease of circulatory system, overweight [6], liver disorders, headache, an imbalance in the fat and carbohydrate metabolism, and inflammation of the pancreas [7]. And also influence on water, electrolyte equilibrium [8] and this lead to water retention and this lead to weight gain [9].

The kidney is essential for the sustainability of the natural cell function and for maintains the normal level of blood, osmolality and volume of plasma [8]. In order to know the influence of oral and injectable hormonal contraceptives on the level of some of the electrolytes and parameters that affect the function of kidney conducted this study.

Material and Methods

The collecting of the blood samples was conducted in the center of the Family Organization in the feminine and children hospital in Al- Muthanna Governorate from women who used the hormonal contraceptives, which included 40 women aged from 18-24 years, which use a contraceptive for three months and more, as well as the control group (do not use the contraceptives), which included 20 women, aged from 18-24 years. The safety of these women has been confirmed from the diseases that may affect the studied parameters such as diabetes, coronary heart disease, blood pressure, kidney failure and other diseases.

The questionnaire was filled for each woman, including name, age, weight, height, body mass index, smoking habit, exercise, diet and duration of contraceptive use. The samples were split into three groups (first group control who did not use any contraceptives ways, the second group who use oral contraceptives, and the third group who use injectable contraceptives). Type of contraceptive used by women includes:

Combined contraceptive pill including:

- Yasmin (0.03 mg of ethinyl estradiol and 3 mg of drospirenone).
- Diane (0.035 mg of ethinyl estradiol and 2 mg of drospirenone).
- Sunya (20 µg ethinyl estradiol and 75 µg of gestodene).

Type of injectable contraceptive used by women (Depot medroxyprogesterone acetate (DMPA)).

Analysis of Electrolyte

After obtaining the samples, they were sent directly to the laboratory for analysis. Serum sodium and potassium levels were measured according to the method [10]. Serum Creatinine and urea level were measured according to the method [11].

Statistical Analysis

The results were statistically analyzed by statistical package of social system (SPSS) (version 20) to determine the mean and standard deviation for each parameter. ANOVA (Analysis of Least Significant) used to determine the significant differences between the groups at probability level ($P < 0.05$).

Result and Discussion

The study was conducted on forty women who use contraceptives: (25 of them use combined oral contraceptives (ethinyl estradiol and drospirenone), 15 others use injectable contraceptives (depot medroxyprogesterone acetate), and 20 women do not use contraceptives are considered as (control groups). From the results obtained, there was an insignificant increase in the level of Urea in the control group in compared with combined oral contraceptives and injectable contraceptives group (Table 1). While the combined oral contraceptives group showed increase in the level of Creatinine, Sodium and Potassium compared to the injectable contraceptives group and control group, but these difference were significant for Creatinine ($P > 0,01$) and non-significant for Sodium and Potassium (Table 1).

Table 1: Effect of Combined oral contraceptives and Injectable contraceptives on parameters in this study

Electrolytes level	Control group	Combined oral contraceptives	Injectable contraceptives	P value
Urea (mg/dl)	26.15 ± 8.70	25.96 ± 5.37	25.94 ± 6.14	NS
Creatinine (mg/dl)	0.72 ± 0.17	1.11 ± 0.32 **	0.93 ± 0.35	0.01
Sodium (mol/L)	135.45 ± 12.20	145.18 ± 9.09	144.54 ± 7.87	NS
Potassium (mol/L)	4.13 ± 1.09	4.66 ± 1.07	4.65 ± 1.28	NS

NS = non-Significant, ** $P < 0.01$

The results of this study were consistent with other study conducted by [12] about the effect of oral contraceptives at the level of Urea and Creatinine, which indicated that there were no significant difference in the level of Urea and a significant increase in the level of Creatinine in women who used oral contraceptive in compared with women do not used oral contraceptive (0.01).

While another study [13] showed a significant increase in the level of Urea and Creatinine when using different doses of combined oral contraceptives (Levonorgestrel and ethinyl estradiol) on laboratory rabbits. The high level of the Creatinine may be due to is that most of the combined oral contraceptives are composed of two hormones: Estrogen and Progesterone. The level of these hormones changes during the

menstrual cycle and period of use of contraceptives [8]. The high level of progesterone increases the level of Creatinine as illustrated by [14]. Creatinine is the product of protein breakdown in the body [15], and its level is not affected by the amount of water, production rate of urine and digestion of the and the rate of excretion and production is constant and is proportional to the mass of the body muscle.

The elevation of Creatinine level in the plasma is an indicator of under excretion which indicates impairment of kidney function, and is considered as an internal indicator in the treatment and diagnosis of kidney diseases and is primarily measured to assess kidney function protein [16, 17]. The results [18] were consistent with sodium level and inconsistent in potassium level of our

study where indicated there was non-significant difference of sodium level and a significant increase in potassium level of oral contraceptives than of control group and injectable contraceptives group. And in another study by [13] appeared that the oral contraceptive group showed a significant decrease in the level of sodium and a significant increase in the level of potassium compared with the control group.

Conclusion

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