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Original Article

Examination of Blood Urea, State of Reactive Oxygen Species And Antioxidants Associated With Oral Contraceptive Pills Among Female Athletes

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ABSTRACT

Blood urea, reactive oxygen species, and antioxidants are interconnected biochemical parameters. In case of any adverse effects of any agents, it directly affects the body's physiological activities. **Objective:** To examine blood urea, the state of reactive oxygen species and antioxidants associated with oral contraceptive pills (OCP) among female athletes. **Methods:** Participants of the study were randomly selected as participants of the study. The users of OCP were placed in the Experimental Group (EG), and the nonuser of OCP was put in (CG). Each group was comprised of twenty-five subjects. 5 ml blood was collected from all the subjects. Each subject was marked with a different identification code. The blood urea level was measured through the blood urea nitrogen (BUN) test. The balancing state of reactive oxygen species and antioxidants was measured through FRAP Assay. Results collected through both BUN and FRAP were calculated through the statistical package for social sciences (SPSS, version 26). **Results:** The mean and standard deviation of EG in term of blood urea was 29.23 ±7.89; df was 82, t-score was -.822, P- value was .413. A significant difference in term of FRAP between CG and EG was found, such as the mean and SD of CG were 137.95±.20.87, means and SD of EG was 110.54±.39.22, the t score was 3.23, and the P value was .002. **Conclusions:** Results show that OCP significantly impacts blood urea and causes an imbalance in both reactive oxygen species and antioxidants among users.

INTRODUCTION

Many females use OCP-containing hormones like estrogen and progesterone for controlling unwilling pregnancy by destroying ovulation, coagulating the cervical mucus and spoiling sperm diffusion [1, 2]. Both estrogen and progesterone are likely hormones produced naturally by the female ovary [3, 4]. Resultant of different factors, naturally, in the human body, reactive oxygen species as free radicals (ROS / RONS), which, by the transfer of their free, unpaired electron, causes oxidation [5, 6]; thus human body leads to oxidative stress. Oxidative stress is the "Imbalance between reactive oxygen species (ROS) and antioxidants in the body". Antioxidants are essential in

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preventing the body from oxidative stress caused by reactive oxygen species. This imbalance leads to tissue damage [7, 8]. In oxidative reactions, organic compounds such as DNA, proteins, carbohydrates and lipids become degraded. The body contains powerful enzymatic and non-enzymatic anti-oxidants, which manage the lethal effects of oxidative stress. As reactive oxygen species generate oxidative stress, so in conditions like inflammation, carcinogenesis, ageing, radiation damage and photo biological reactive oxygen species are involved. This area of research (oxidative stress) provides new perspectives in pathophysiology, toxicology, biochemistry and pharmacology [7]. In a normal person, the level of reactive oxygen, species and antioxidants remain equal. When this balance disturbed, the level of reactive oxygen becomes increased [9, 10]. Living organisms use the oxygen to survive. As oxygen is poisonous to the body, these organisms contain antioxidants to counteract free radicals bent due to biochemical reactions and safeguard the body from the toxic effects of oxygen. Antioxidants are the constituent which foils the oxidation of organic molecules, produced in the body and also taken with food. Considering the above critical analysis of previous studies, it is clear that OCP users may be at risk of different health problems. What is the impact of OCP on the blood urea and antioxidant system? To discover this fact, the researcher intends to conduct a research study under the title "Assessment of Blood Urea and Oxidative Stress Induced by Oral Contraceptive Pills among Females Athletes."

METHODS

The researcher adopted the below procedures to reach specific findings and conclusions. Female athletes were taken as Participants of the study were randomly selected as participants of the study. The users of OCP were placed in the Experimental Group (EG), and the nonuser of OCP was put in (CG). A random sampling technique is used for selecting sample and thus each group was comprised of twenty-five subjects. 5ml blood was collected from all the issues. Each subject was marked with a different identification code. The ethical and review board of Gomal University, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan, approved the protocol of this particular research study. The blood urea level was measured through the blood urea nitrogen (BUN) test. The balancing state of reactive oxygen species and antioxidants was measured through the Ferric Reducing Assay Protocol (FRAP Assay). Results collected through both BUN and FRAP were calculated through the statistical package for social sciences (SPSS, version 26.0) and by using analyzed by using mean, standard deviation, frequency and percentage etc., as statistical tools. Mean and Standard Deviation was calculated for quantitative variables and frequency and percentages for qualitative variables. Independent sample t test was applied to find out the significant difference of blood urea levels among both groups. p value <0.05 was considered as significant. Mean: The mean can be used to represent the typical value and therefore serves as a yardstick for all observations. It is calculated as:

Mean Formula

$$\text{Mean} = \frac{\text{Sum of All Data Points}}{\text{Number of Data Points}}$$

$$\text{Mean} = \text{Assumed Mean} + \frac{\text{Sum of All Deviaions}}{\text{Number of Data points}}$$

Standard Deviation: Standard deviation measures the dispersion of a dataset relative to its mean. It is calculated as the square root of the variance. Standard deviation, in finance, is often used as a measure of the relative riskiness of an asset.

RESULTS

Table 1 represents the age-wise difference in blood urea mg/dl in both CG and EG. 15 participants were between age 20-25 years, 20 participants were between age 26-30 years and 15 participants were above the age of 31 years.

Age-wise groups	Number
20 -25 years	15
26-30 years	20
31 years and above	15
Total	50

Table 1: Showing the age-wise difference regarding Blood Urea mg/dl in both CG and EG

Table 2 shows the mean difference in blood urea mg/dl in CG and EG. The data indicate the same result regarding blood urea in both CG and EG. The mean and standard deviation of CG was 27.66 ±7.86. The mean and standard deviation of EG was 29.23 ±7.89, df was 82, t-score was -.822, p-value was 0.413.

Groups Statistics						
Testing Variables	Testing Groups	N	Mean ± SD	Df	T-score	p-Value
Blood Urea mg/dl	CG	25	27.66±7.86	82	-.822	.413
	EG	25	29.23±7.89			

Table 2: Showing the mean difference in Blood Urea mg/dl in both CG &EG

Table 3 shows a significant difference between CG and EG in FRAP. The mean and SD of CG were 137.95 ± .20.87, means and SD of EG was 110.54 ± .39.22, the t score was 3.23, and the P value was .002.

Groups Statistics						
Testing Variables	Testing Groups	N	Mean ± SD	Df	T	p-Value
FRAP	CG	25	137.95±.20.87	82	3.23	.002
	EG	25	110.54±.39.22			

Table 3: Showing the mean difference in FRAP in both CG and EG

DISCUSSION

The result of the study reveals that there is no significant

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difference between age-wise three groups in Blood Urea mg/dl because (F= .298, P > 0.05). The mean scores of the three age-wise groups were the same. So, it is found that there is no effect of age on Blood Urea mg/dl. Similarly, is no significant difference between the blood Urea of both CG and EG. Blood urea such as the mean and standard deviation of CG was 27.66 ±7.86, The mean and standard deviation of EG was 29.23 ±7.89, df was 82, t-score was -.822, P- Value was .413. The same finding is drawn by [11, 12], showing that OCP has no effects on blood urea. Opposing the result of the current, the findings revealed by the study conducted [13] and demonstrated that plasma glucose and urea concentrations were unaffected by the menstrual phase or either OCP; likewise, no significant effect was found among OCP users, and thus the finding of the study reveals that OCP is safe and having side effects in term of biochemical parameters of the body [14]. The study shows a significant difference between CG and EG regarding FRAP. In line with this emerging finding, the survey conducted by [15-17] concluded that long-term use of oral contraceptives causes abnormalities in the liver. In the group of 42 women of an average age of 32 years using oral contraceptives. These women were matched with control women who were not using any contraceptives. It was indicated that there was a significant difference between cases and control movement because women taking oral contraceptives are associated with liver abnormalities, such as liver cell adenomas and hemorrhage into the tumour. Thus, it was concluded that prolonged use of oral contraceptives causes abnormalities in the liver. Finding of the study conducted by [18-20] support the present study by finding out that oxidative stress is caused by oral contraceptives (OC), which could be disadvantageous to physical activity and raise cardiovascular risk (as thromboembolism).

CONCLUSIONS

Based on the analysis, the researcher arrived at the conclusion that there is no significant difference between the blood urea of the control and subjects. It means that OCP has no effect on blood urea. In addition, the researcher also draws the conclusion that OCP has a significant impact on the antioxidant system and cause oxidative stress among its user.

Conflicts of Interest

The authors declare no conflict of interest.

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