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Research Article

A study for the effects of vitamin E on the sperm activation of sub- fertile patients

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ABSTRACT

At the outset, we would like to point out that this study was conducted at Al-Sadr Teaching Hospital in Najaf, Iraq, between Nov. 2018 and July 2019. The study sample was made up of 150 patients in the hospital and the main purpose herein is to determine the effects of vitamin-E and its ability to stimulate sperm in patients with weakness. The main results obtained, there is a significantly decreasing $P < 0.05$ in the sperm-concentration that was evaluated in the post-activation stage in the laboratory, both in the treatment and the control-groups compared to the pre-activation groups using Ferticuilt medium through the so-called mixing technique. The direct thing as we would mention pointing out is that there were no-statistically-significantly-differences in the estimated value with different concentrations of vitamin-E used. One of the significant and meaningful results is the spermatozoa motility ratio, as it is found that the spermatozoa-motility ratio and the degree of motility increased in a significant manner $P < 0.05$ in both treatment and control-groups compared to the pre-activation groups by the aid of the above mentioned-medium and by direct-mixing-technique. We would like to point out that there were no-significant-differences in the values estimated by the different-concentrations of vitamin-E used, but it was observed that the results were preferred with sperm activation in the laboratory. Regarding the improvement of the spermatozoa motility ratio as well as the kinetic degree with the median when adding (0.06) Mg/ml) of $vit-$E.

Keywords: Sperm fertility patients, $vit-$E

INTRODUCTION

To start with, we would like to outline some of the definitions that researchers have defined for a topic that affects every newly married husband and wife, where (Saad and others 2019) knew that infertility is the natural inability of a couple to find a pregnancy by practicing the intimate sexual relationship between them naturally in a period of no more than a year from their confrontation. In 2010, the World Health Organization set an approximate period for pregnancy to occur, and it is most often pregnancy during a year of marriage, at a rate ranging between 80% and 85% for those couples who do not use any method of contraception, as infertility is a source of concern, discomfort, and major concerns and affects nearly 15% of all couples of reproductive age and no D point out that the most important reasons for infertility are those that include decreased quality of semen and are responsible for 25% of cases of infertility. When we want to talk about the different types of reactive oxygen, it can be said that it is a group of factors that are characterized by a strong interaction and belong to the category of free-radicals, which constitutes group chemical-molecules that interact with an oxidized-electron and also helps in modifying the bilateral molecules that it encounters. Sperm plasma contains many types of reactive oxygen, for example, the superoxide anion, the root hydroxyl and hydrogen peroxide are all of the many types of the main reactive oxygen found in the sperm plasma. Sperm cells require living in airy conditions of oxygen to support their life, but metabolites, like different types of reactive oxygen, can alter the functions of the sperm cell and thus endanger the cell's survival. We would also like to talk a little bit about germ-cells and we can say that these cells possess male germ cells in different stages of differentiations the ability to create different types of reactive oxygen, and there is a need for low physiological levels in order to

regulate the reproduction of sperm as a reaction to acrosome and fusion of cells Sperm (Agarwal, 2004, Ashok, 2010). Also, the excesses reactive oxygen cells must be continuous-disabled using anti-oxidants in the seminal-plasma in order to maintain the function of the normal-cell. Also, oxidative-stress occurs when the excess-free-radicals defend the anti-oxidant in male-reproductive-system (Dinish, 2012). Reactive oxygen levels are usually restricted by anti-oxidant defenses mechanisms such as % $vit-$C and -E in membrane-sperm plasma as well as sperm membrane (Magda, 2012) except that supplementing males with infertility with vit-C and -E anti-oxidants has his suggestion as a possible treatment for male infertility and the unknown is caused (Edmund, 2012). $vit-$E is 8 fat-soluble compounds that include both tocopherols and tocrerinol (Brigelius-Flohe and Traber, 1999). Among these forms, tocopherols γ is commons in North-American-diet and is found in corn-oil, soybean-oil, ghee and dressings. One of the largest biologically active-α-tocopherols in North America is alpha-tocopherols, which is the second form of $vit-$ as a fat-soluble anti-oxidant, as it stops the production of reactive-oxygen-species that form when fats are subject to oxidation (Packer, 2001). The 8-shapes of vit-E are classified to 2-categories; 4-of them are toco-pherols and the other 4-, are tocotrienols, and they are by prefixes α, β, γ-and δ.

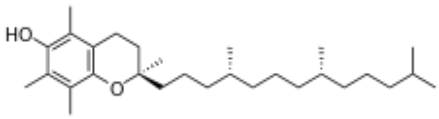

Figure (1): α-tocopherols shapes of $vit-$E

Biological functions of vit-E

One of the most important functions is anti-oxidants (Traber and Stevens, 2011).Functions including enzymatic activities, gene expression and neuro-logical functions, (Traber and Stevens, 2011) have suggested that the important function of vit-E is cell-signaling as an anti-oxidant, and α-toco-pherols is an important fat-soluble-anti-oxidant as it performs its-functions as an anti-oxidant in the pathway of glutathione-peroxidase and protecting cell-membranes from oxidations through its interaction with lipid-roots produced in the reaction of the lipid-peroxide-chain, this will remove the intermediate free-radicals and prevent oxidation-reaction from continuity. We would like to point out that we can recycle the oxidized α-tocopheroxyl roots produced in this process back to the active reduced form by reducing the process by flashing other oxidants such as acerbate, retinol, or ubi-quinol (Wang, 1999). $vit-$E has many different forms and each type has its own characteristics that distinguish it from others. For example, to-tocopherols are a nucleus that can interact with the mutation loving the electrophoresis. Here, $vit-$E acting-radical creeping agent for peroxyl and it prevents the reproduction of free-tissue-radicals. The main objective was determination $vit-$E effects on the activity of spermatozoa in patients-laboratory with then infertility.

MATERIALS & METHODS

Patients

With regard to the samples of the current study, 150 samples were taken of the seminal fluid from infertility patients and their ages were between 20-62 years, while they were in Al-Sadr Teaching-Hospital in Najaf, Iraq, for age group, blood type, type of infertility, duration and assessments of the presence/absence of varicocele, excluding patients with diabetes, high blood pressure or leucopenia in this study.

Samples: method of obtaining it, its specifications and characteristics

First: the method of sampling

In terms of the way to obtain the samples, they were through masturbation after abstaining from sex for a period of 3-5 days.

Second: Samples keeping

The sample is kept in a disposable plastic container and incubated at 37^0C for liquefaction (Pal, 2006).

Third: Samples characteristics and specifications

There are many characteristics with regard to samples in laboratory laboratories, including:

- Sample-size
- Sample-PH
- Color-situation
- Viscous-situation
- Lique-faction-time
- Sperm-concentrations
- Sperm-motility-ratio
- Sperm-active-degree
- Sperm-morphogenesis & accumulation (WHO, 1999).

Samples treatment and statistical analysis

First, divide the sperm samples into four parts as follows:

Part I

By taking 0.5mg of semen and mix it with 0.5mg with Ferticuilt medium incubated at temperature for 30-minutes.

Part II, $vit-$**E1**

Where 0.5mg of semen is mixed with 0.5mg enriched medium and 0.02mg of $vit-$E at temperature for 30-minutes.

Part III $vit-$**E2**

Where 0.5mg of semen is mixed with 0.5mg enriched medium and 0.04mg of $vit-$E at temperature for 30-minutes.

Part IV, $vit-$**E3**

Where 0.5mg of semen is mixed with 0.5mg enriched medium and 0.06mg of $vit-$E at a temperature for 30-minutes.

After treating all semen samples, the next stage, which is the examination stage, the third evaluation stage, then the fourth and final stage, begins assessing statistical-differences in the observed-results.

With regard to the stage of statistical analysis, the value of P <0.05 was considered as average and of utmost importance in statistical analysis.

RESULTS AND DISCUSSION

The results of the study had multiple indications, especially in the post-activation stage in the laboratory, where it was found that there was an apparent-decreasing in $P < 0.05$ sperm-concentrations which was evaluated after the in vitro activation in both the treatment group and the control group and there were no-statistical-apparent-differences in the sperm-concentrations between treatment-groups. We would like to point out that there was a significant-increase in sperm-motility as well as the motion-degrees at $P < 0.05$ in both treatment- & -groups compared to the previous activation, and there were no-statistically-apparent-differences in the evaluation values between vit-E group and we noted that the best laboratory results. The indicator of sperm-motility and the mobility-sperm-degree using the Ferticuilt medium enhanced with $vit-$E at concentration-0.06mg/ml. Also, the sperm-motive-index was -apparent-increased by doubling the motility of sperm in both the treatment group and the control-group compared to the pre-activation groups and there were statistically-significant-differences in the estimated value of the concentration of vitamins used and the results obtained in figures (1-4).

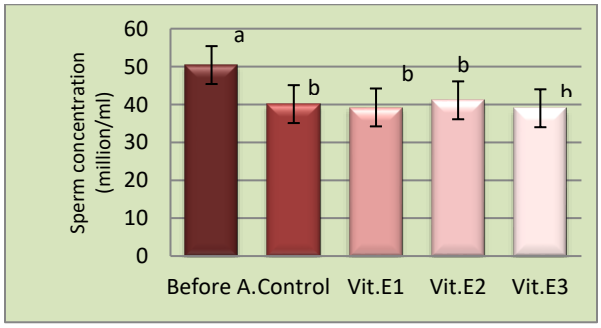

Figure (2): Mean-sperm-concentration at different $vit-$**E-concentrations**

Before-A= before-activation,
Control = Ferticuilt-medium,
$vit-$E1 = $vit-$E1 (0.02mg/ml),
$vit-$E2 = $vit-$C (0.04mg/ml,
$vit-$E3 = $vit-$E (0.06mg/ml),

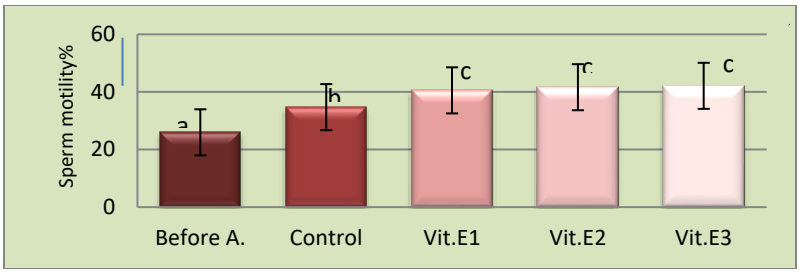

Figure (3): Mean-sperm-motility, to different $vit-$E-concentration

Before A A= before-activation,
Control= Ferticuilt-medium,
$vit-$E1$=vit-$E1 (0.02mg/ml),
$vit-$E2$=vit-$E (0.04mg/ml,
$vit-$E3$=vit-$E (0.06mg/ml),

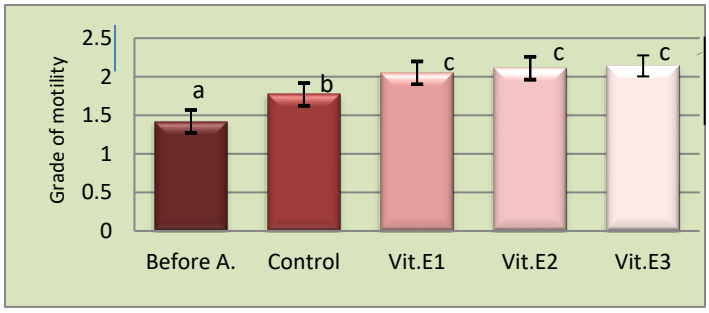

Figure (4): Mean-motility-grade to different $vit-$E-concentrations

Before $A=$ before-activation,
Control $=$ Ferticuilt-medium,
$vit-$E1$=vit-$E1 (0.02mg/ml),
$vit-$E2$=vit-$E (0.04mg/ml,
$vit-$E3$=$ $vit-$E (0.06mg/ml),

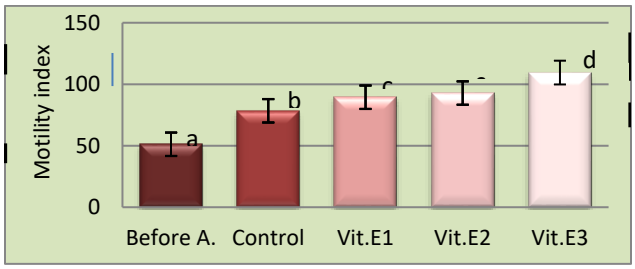

Figure (5): Mean-sperm-motility

Before $A=$ before-activation,
Control=Ferticuilt-medium,
$vit-$E1$=vit-$E1 (0.02mg/ml),
$vit-$E2$=vit-$E (0.04mg/ml,
$vit-$E3$=$ $vit-$E (0.06mg/ml),

CONCLUSION

Given the extreme importance of the subject of study for each newly built family, one of the most important requirements, and even a deficit in it, may destroy the family and increase divorce-cases, and from this concept and with the help of modern-technologies, those that have contributed greatly to helping couples to have children, it was recently observed that these techniques are the best treatment method in the majority of cases of males/females-infertility-diseases, and we recall that one factor determining successful reproduction is the quality of semen-samples, and that the optimal choice of methods for sperm preparation depends very heavily on the quality of ejaculation and we find that there are many different groups of modern techniques for preparing available sperm to select moving sperm. In the current study, any of the leukocytes was excluded and we applied the direct mixing technique, which is a simple and low-cost method for preparing sperm from patients with incomplete-myasthenia in an attempt to prevent any damage that may occur by expulsion central and reactive oxygen generation. It was found from the current study that among the three doses of $vit-C$ and -E hat were used, we found a significant-decrease $P<0.05$ in sperm-concentration that were evaluated after laboratory activity in both the treatment group and the control group as compared to the pre-groups. Activation using Ferticuilt-medium by direct mixing-technique, this result is expected due to dilution because we mix (0.5 ml) semen sample with (0.5 ml) Ferticuilt-medium added to vitamins and this dilution leads to reduced sperm concentration. We also noted from this study that when adding vitamin E to the treated samples, we found a significant increase $P<0.05$ in % of sperm-motility as well as the motor grade of the sperm that was evaluated.

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