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# Effect of Anti-Cardiolipin (Igg-Igm) and Its Relationship with the Level of White Blood Cells in Women Undergoing Intracytoplasmic Sperm Injection (ICSI)

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**Abstract:** This study was conducted on 84 samples of women subject to the ICSI program which belong to 84 women who suffer from non-pregnancy for patients attending the fertility centre in Al-Sadr Medical Hospital in the governorates of Najaf, for the period between January 2019 and March 2020. In this study, the sample was divided into two sections An intravenous blood section to measure WBC and a serum section to measure anti-cardiolipin (IgG-IgM) while  $\beta$ -hCG was used to indicate the success of ICSI, the presence of pregnancy from its absence, as these groups were divided The interior is in threshing, based on the  $\beta$ -hCG level to Two groups (Pregnant Women Group - Pregnancy Failure Group) and then divided the total of pregnant women into (Pregnancy Group and spontaneous miscarriage) and then demonstrate the immunological effect on the pregnancy of women after ICSI technique. The results of the current research showed a significant increase at the level of significance ( $p < 0.05$ ) in the level of the hormone  $\beta$ -hCG and that the increase in the level of this hormone is evidence of the presence of high success rates for pregnancy in women who performed operations IVF, where the success rate at the beginning of the matter reached 61.9%, after which it decreased to 33.3% after the first three months due to the occurrence of a spontaneous miscarriage of pregnant women due to various immunological and physiological reasons, as well as a positive correlation between the level of  $\beta$ -hCG and other parameters within the study (Antiphospholipid (IgG-IgM) -WBC). The results of the current research also showed a significant difference at the level of significance ( $p < 0.05$ ) between the group (pregnancy failure) and the group (spontaneous miscarriage) compared with the control group (continued pregnancy) in relation to the level of anti-cardiolipin (IgG-IgM), Also, The results of the current research showed a significant difference at the level of significance ( $p < 0.05$ ) between the group (pregnancy failure) and the group (spontaneous miscarriage) compared with the control group (continuation of pregnancy) in relation to the level of WBC, and the present study found a positive relationship between the level of anti-cardiolipin (IgG-IgM) and WBC.

**Keywords:** Miscarriage; ICSI technique; Anti-cardiolipin (IgG-IgM); White blood cells.

## INTRODUCTION

Infertility is a widespread disease worldwide and it means "the inability of the spouses to achieve pregnancy within one year of marriage" and the estimated rate of infertility in the world is around 15-20%[1]. Many factors can affect couples marriage such as hormonal disorders, vitamin D, and other biomarkers to occur infertility case in one of the couples or both[13,14,15,16].

*In vitro* fertilization, intracytoplasmic sperm injection (ICSI), and intrauterine insemination (IUI) be are the main methods of assisted reproductive technology (ART). Found several various studies in recent years have indicated that occur risk factor for implantation failure of women after *In vitro* fertilization - ICSI which may be immunological parameters or biochemical parameters may be affected on *In vitro* fertilization - intracytoplasmic sperm injection results [1].

White blood cells (WBCs) They are considered an important part of the immune system in the body, It should be noted that the increase in the number of white blood cells[17] or their lack of a normal limit indicates the presence of a health problem that afflicts the patient, it cause of white blood cells rise for a number of reasons, the most important of which are summarized below For pregnancy and childbirth or spontaneous miscarriage because increase Infection in Urinary tract with or immune system problem [2].

Anti-cardiolipin antibody (ACA) syndrome is one of the autoimmune diseases that leads to blood clotting in both arteries and veins. This is due to clogged blood vessels in the placenta that are responsible for delivering food and oxygen from mother to fetus during pregnancy [3].

## MATERIALS AND METHODS

This study was conducted in the laboratories of the Department of Biology, College of Science, University of Kufa, and in the Laboratory of the Fertility Center in Sadr City Medical City in Najaf Governorate / Najaf Health Directorate / Ministry of Health / Iraq.

Have been taken about five millilitres of intravenous blood samples were drawn in the morning from women which undergoing intracytoplasmic sperm injection (ICSI) technique during three parts: the first part after 14 days from an injection, the second part after trimester spontaneous miscarriage while the third part for women which be continuously pregnant and using a needle and syringes which is used for one time from each patient and control. Four millilitres of the blood then it was left in a gel tube at room temperature for 10 minutes to complete the blood clotting, then centrifuged at 3000 rpm for 5 minutes, then the serum was separated for measurements of  $\beta$ -hCG level and anti-cardiolipin (IgG-IgM) level by ELISA method and one millilitre of the blood was put in EDTA-Na<sub>2</sub> treated collection tubes for measurements of a number of white blood cells count by GENEX HEMATOLOGY ANALYZER.

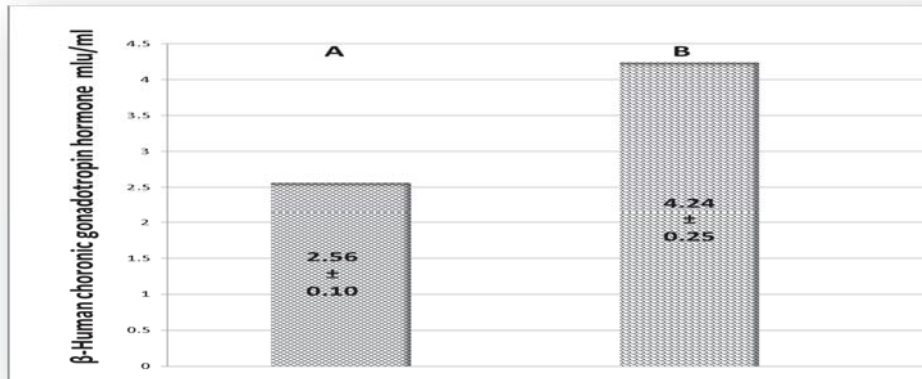
### Statistical Analysis

The popular statistical system (Graph Pad prism ver. 5) was adopted, and one-way analysis of variance table - Anova method (by Tukey's multi-comparative test) was used to compare the groups divided into the measured parameters. The results are expressed as (Mean  $\pm$  Stander Error). Correlation coefficients were calculated to estimate the correlation between tags and parameters. Descriptive statistics and correlation coefficients were performed using mega stat (V10.12 version) for excel 2010[4].

## RESULTS

### Results of B-Human Chorionic Gonadotropin Hormone Test

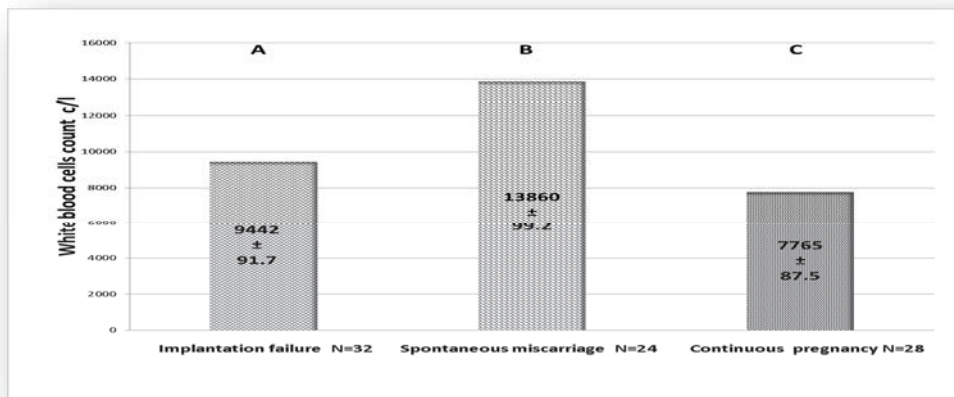
This test showed found a significant difference ( $p < 0.05$ ) between pregnant women which were 52 ( $4.24 \pm 0.25$ ) and non-pregnant women (Implantation Failure) ( $2.56 \pm 0.10$ ) which was 32 from women which undergoing intracytoplasmic sperm injection technique as shown in figure (1)



**FIGURE 1.** Result  $\beta$ - Human chorionic gonadotropin hormone test which differs between pregnant women which were 52 and non-pregnant (Implantation Failure) which was 32 from women which undergoing intracytoplasmic sperm injection technique. Different letters mean significant differences at ( $p < 0.05$ ).

### Results of White Blood Cell Count

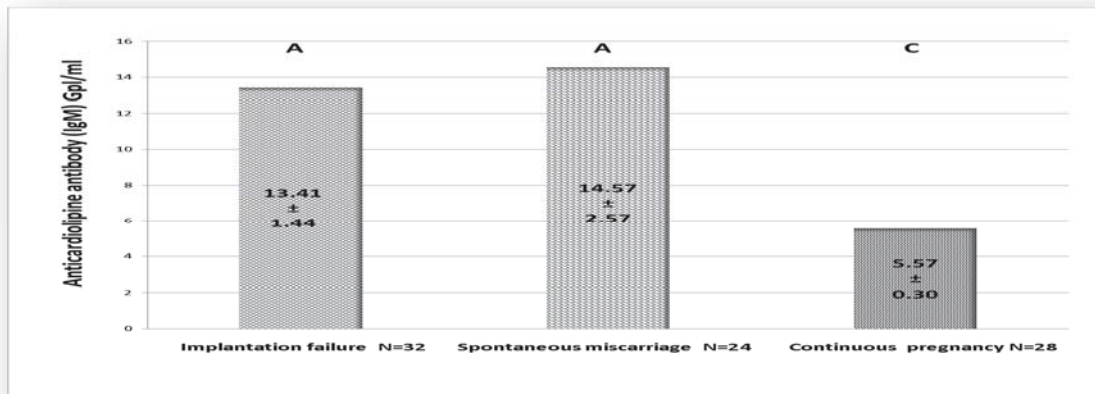
This test showed found a significant difference ( $p < 0.05$ ) between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which were 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and found non-significant difference with spontaneous miscarriage (24) ) as shown in figure (2)



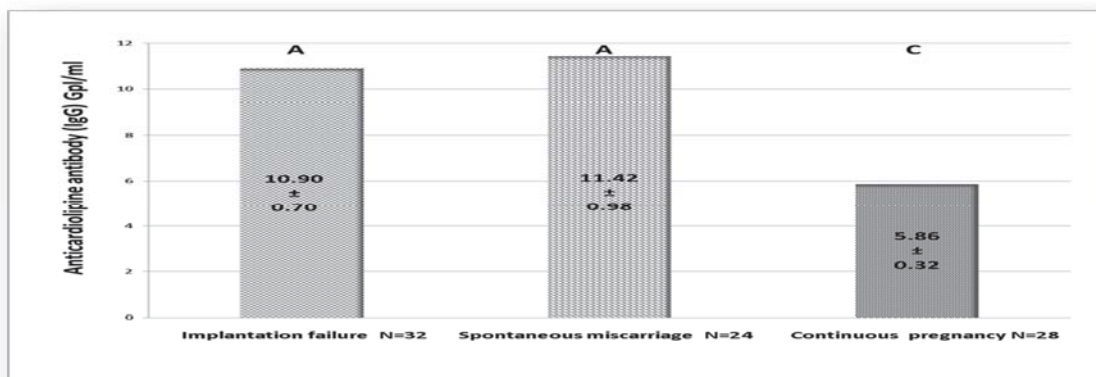
**FIGURE 2.** Results of White blood cell Count test which differ between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which were 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24)). Different letters mean significant differences at ( $p < 0.05$ ).

### Results of Anti-Cardiolipin (IgG-IgM) Test:

This test showed found a significant difference ( $p < 0.05$ ) between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which were 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24) ) as shown in figure (3-4).



**FIGURE 3.** Results of anti-cardiolipin (IgM) test which differ between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which were 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24) ). Different letters mean significant differences at ( $p < 0.05$ ).



**FIGURE 4.** Results of anti-cardiolipin (IgG) test which differ between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which were 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24) ). Different letters mean significant differences at ( $p < 0.05$ ).

### Correlation between Anti-Cardiolipin (IgM) Test with White Blood Cells Count

The study showed the presence of a positive correlation between, anti-cardiolipin (IgM) test with White blood cells count Figure (5).

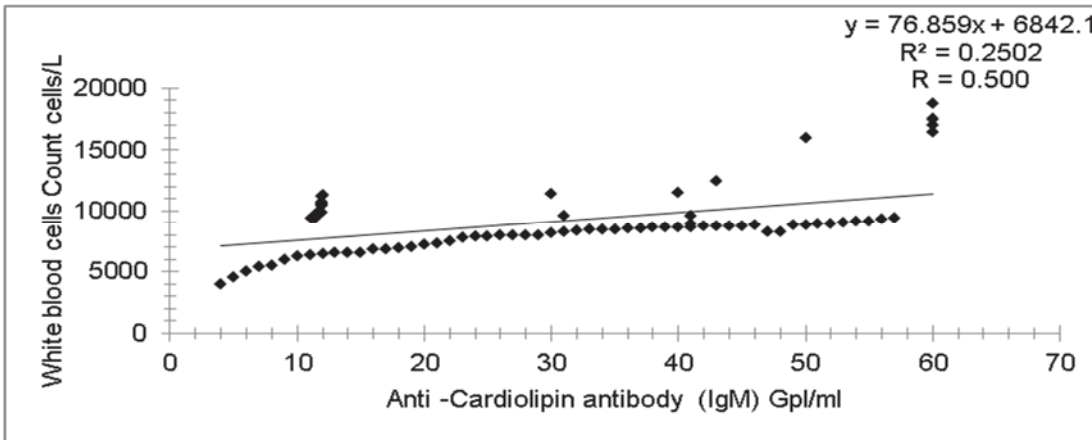


FIGURE 5. The correlation between anti-cardiolipin (IgM) test with WBC.

### Correlation between Anti-Cardiolipin (IgG) Test with White Blood Cells Count

The study showed the presence of a positive correlation between, anti-cardiolipin (IgG) test with White blood cells count Figure (6).

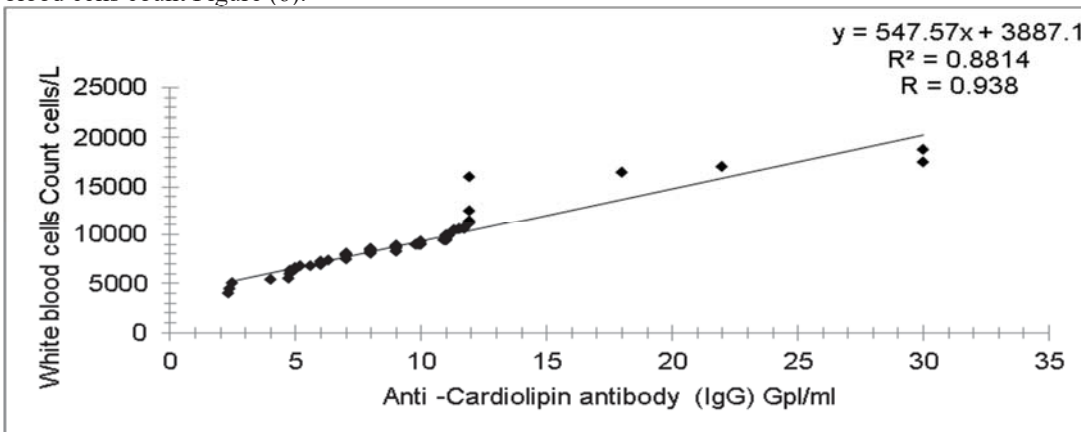


FIGURE 6. The correlation between Antiphospholipid (IgG) test with WBC.

## DISCUSSION

The results of the current research showed a significant increase in the level of significance ( $p < 0.05$ ) in the level of the  $\beta$ - Human chorionic gonadotropin hormone, and the reason for this is that this hormone is evidence of the presence of pregnancy in women who underwent ICSI operations may be because it is excreted mainly from the placenta during the formation of the fetus and this study is consistent with what reached [5] in this regard and that the increase in the level of this hormone is evidence of high success rates of pregnancy for women who conducted ICSI operations, where the success rate initially reached 61.9%, after which it decreased to 33.3% after the first three months due to the occurrence of spontaneous abortions for women. Pregnant women for various immunological and physiological reasons, as this study indicated, and these results are consistent with what was reached [6][7] [8].

The results of the current research also showed a significant increase ( $p < 0.05$ ) in anti-cardiolipin antibody (IgG-IgM) of implantation failure group and spontaneous miscarriage group compared with the continuous pregnancy (control group), while the differences were not statistically significant between the both groups implantation failure and spontaneous miscarriage. The reason for the increased concentration of anti-cardiolipin antibody (IgG-IgM) in miscarriage women, and the group of pregnancy failure may be due



to clotting syndrome is a blood clotting disorder that causes blood clots in the capillaries which lead to a lack of blood flow to the uterus, which leads to a weak endometrium, and thus accelerate the process of miscarriage of the fetus as a result of poor fetal consistency in the endometrium due to weak endometrium while in the case of continuous pregnancy (control group). The anti-cardiolipin antibody (IgG-IgM) level is low, which means there be no thrombus in the capillaries, and thus the blood flow is normal and therefore, the adhesion of the fetus is a strong adhesion due to the strength of the inner lining of the uterus, which leads to the lack of miscarriage. As it was explained that the increase in the level of anti-cardiolipin antibody (IgG-IgM) in miscarriage women during the first three months of pregnancy, compared with non-pregnant women by 15 % [9] [10] [11].

The current study also showed a positive correlation between the level of anti-cardiolipin antibody (IgG-IgM) and WBC and perhaps the reason for this is that the increase in the level of white blood cells during pregnancy or spontaneous miscarriage in women [17], which is often accompanied by an increase in urinary and genital tract infections which leads to an increase in the level of anti-cardiolipin antibody (IgG-IgM) [12].

## CONCLUSION

The present study concluded that the positive relationship between WBC and anti-cardiolipin antibody is considered one of them as an indicator to the other in the occurrence of miscarriage in women who undergo the Intracytoplasmic Sperm Injection technique.

## REFERENCES

- Poongothai, Subramani, Rajendra Pradeepa, Anbhazhagan Ganesan, and Viswanathan Mohan. (2009): "Prevalence of Depression in a Large Urban South Indian Population - The Chennai Urban Rural Epidemiology Study (Cures - 70)." *PLoS ONE* 4(9).
- Glenn, A., and Armstrong, C. E. (2019). Physiology of red and white blood cells. *Anaesthesia & Intensive Care Medicine*.
- Erkan, D., Unlu, O., Lally, L., and Lockshin, M. D., (2017). Antiphospholipid Syndrome: What Should Patients Know?. In *Antiphospholipid Syndrome* (pp. 341-357). Springer, Cham.
- Motulsky, H.J. (2003). Graph pad prism 4.0 statistics Guide- statistical analyses for laboratory and clinical researchers. Graphpad software, San Diego CA.
- Gold, R. S., Azem, F., Yovel, I., Wagman, I., Amit, A., & Lessing, J. B. (2000). Does ICSI affect early serum  $\beta$ -HCG in pregnancies achieved after IVF?. *Human reproduction*, 15(6), 1221-1224.
- Humaidan, P., Ejdrup Bredkjær, H., Bungum, L., Bungum, M., Grøndahl, M. L., Westergaard, L., & Yding Andersen, C. J. H. R. (2005). GnRH agonist (buserelin) or hCG for ovulation induction in GnRH antagonist IVF/ICSI cycles: a prospective randomized study. *Human Reproduction*, 20(5), 1213-1220.
- Harun, R., Ruban, L., Matin, M., Draper, J., Jenkins, N. M., Liew, G. C., ... & Moore, H. D. M. (2006). Cytotrophoblast stem cell lines derived from human embryonic stem cells and their capacity to mimic invasive implantation events. *Human reproduction*, 21(6), 1349-1358.
- Theilen, L. H., Mellnick, V. M., Shanks, A. L., Tuuli, M. G., Odibo, A. O., Macones, G. A., & Cahill, A. G. (2017). Acute appendicitis in pregnancy: predictive clinical factors and pregnancy outcomes. *American journal of perinatology*, 34(06), 523-528.
- Ruffatti, A., Favaro, M., Calligaro, A., Zambon, A. and Del Ross, T., (2019). Management of pregnant women with antiphospholipid antibodies. *Expert review of clinical immunology*, 15(4), 347-358.
- Khangura, R. K., Cooper, S. and Luo, G. Y., (2019). Anti-phospholipid Antibody Syndrome: Pathogenesis, Diagnosis, and Management in Pregnancy. *Maternal-Fetal Medicine*, 1(1), 38-42.
- Krivonos, M. I., Kh. Khizroeva, J., Zainulina, M. S., Eremeeva, D. R., Selkov, S. A., Chugunova, A., and Sultangadzhiyeva, K., (2020). The role of lymphocytic cells in infertility and reproductive failures in women with antiphospholipid antibodies. *The Journal of Maternal-Fetal & Neonatal Medicine*, 1-7.
- Rudnicka, E., Kunicki, M., Suchta, K., Machura, P., Grymowicz, M. and Smolarczyk, R., (2020). Inflammatory Markers in Women with Polycystic Ovary Syndrome. *BioMed Research International*, 2020.
- (13) Al-Shimerty, Dhigam F. Hassan and AL-Sallami, Alaauldeen S.M(2020). The Effect of Vitamin D3 and its Relationship with the Level of White Blood Cells in Women Spontaneous Miscarriage

Undergoing Intracytoplasmic Sperm Injection (ICSI) Technique. Medico-legal Update, Vol. 20, No. 4, pp. 164-171.

14. (14) Albaldawy, M.T. and Alsalami, A.S. (2017). Study of association among vitamin D, testosterone and semen quality in fertile and Iraqi infertile men. *Journal of Pharmaceutical Sciences and Research*, 2017, 9(7), pp. 1067–1071.
15. (15) Hammood, S.A., Al-Sallami, A.S. and Al-Khafaji, S.M. (2019). Study the relationship between TEX101 protein, inhibin B and testosterone hormone in azoospermia and severe oligospermia in infertile patients. *Indian Journal of Public Health Research and Development*, 2019, 10(5), pp. 1274–1279.
16. (16) Hammood, S.A. and Al-Sallami, A.S.M. (2020). The role of cdx-ii, dyslipidemia, vitamin d in polycystic ovary syndrome. *Indian Journal of Forensic Medicine and Toxicology*, 2020, 14(2), pp. 2197–2201.
17. (17) Al-Shimerty, Dhigam F. Hassan and Al-Sallami, Alaauldeen S.M. (2021). The effect of interleukin-10 and its relationship with the level of white blood cells in women spontaneous miscarriage undergoing intracytoplasmic sperm injection (ICSI) technique. *Indian Journal of Forensic Medicine and Toxicology*, 2021, 15(1), pp. 990–994.