

# Study if Some Biomarkers in Abortion Women Undergoing Intracytoplasmic Sperm Injection (Icsi) Technique

Al-Msaid Hayder L. F<sup>1</sup>, Husham Qassim Mohammed<sup>2</sup>

<sup>1,2</sup>Kufa university, Iraq

Email: [haiderl.ligan@uokufa.edu.iq](mailto:haiderl.ligan@uokufa.edu.iq)

## Abstract

The term abortion at the end of pregnancy after several weeks There are many reasons for abortion such as genetic factors and immune factors. In the current study, 60 samples of blood samples and whole blood samples were collected from women who underwent intracytoplasmic sperm injection technique who attended the fertility center in Sadr City Medical Center in Najaf Governorate, Najaf Health Directorate / Ministry of Health / Iraq., and 30 continuously pregnant women (control group) and the results were a significant increase for aborted women compared to the control group for interleukin, but there was a significant decrease in the level of vitamin D three for the aborted women compared to the control group. Through the results of our research, we conclude the role of the vitamin, as its deficiency leads to an increase in cytokines, and we find that this increase leads to miscarriage of pregnancy.

**Keyword:** abortion women, interleukin10&17 and vitamin D3

## 1. Introduction

Abortion term use of the end of the pregnancy after many weeks [1, 2] there is many cause of the abortion such as genetic factors and immunological factors [3, 4]. The immunological factors have many cause which may by interaction with women abortion [5, 6]. Lymphocytes of the adaptive immune system have active functions such as cytokine production antibodies and direct killing of intracellular pathogen-infected cells [7, 8]. The ability of the immune system to self-regulate is important, as failure to do so would harm the body and is involved in allergic and autoimmune disease [9, 10]. The adaptive immune system also creates an immune memory, which reveals an immediate and powerful protective response against previously encountered pathogens [11, 12]. Although trophoblasts do not present allosteric antigens, they are oligomerized Buds, cellular debris, microparticles, and exosomes in the mother Rotation [13, 14]. These particles are cleared by maternal macrophages and the antigenic peptides can then be displayed and recognized [15, 16]. Moreover, the fetus cells can be found in blood samples taken from most pregnant women and it is also found in tissues outside the fetus [17, 18]. A number of studies indicate that high levels of the anti-inflammatory cytokine interleukin17 may lead to pregnancy loss and sometimes low levels of interleukin-10 and high levels of the pro-inflammatory cytokines interleukin-6, tumor necrosis factor and interferon-associated symptoms of threatened spontaneous abortion [19-21].

In our study, interleukin 17, interleukin 10 and vitamin D3 were measured and their relationship with abortion was studied.

## 2. Material and Method

The study was conducted in the scientific

laboratories of the Department of Life Sciences, College of Science, University of Kufa, as well as in the scientific laboratories of the Fertility Center in Al-Sadr Medical City, Najaf Governorate. From January 2020 to March 2022 Blood serum and whole blood samples Collected from women undergoing intracytoplasmic spermatogenesis Injection technique attended at the fertility center. Average lifespan of women undergoing endoplasmic reticulum The sperm injection technique was (30.15 ± 0.35) years and the age range for each was Patients' ages ranged between (20-31) years and samples were collected after spontaneous abortion And this study which is divided into two groups pregnant and implantation failure according to the results of  $\beta$ -human chorionic gonadotropin after two weeks of in vitro fertilization - intracytoplasmic sperm injection technique process, and the pregnant group divided into two groups continuous pregnancy (control group) and spontaneous abortion group (between 1 and 3 months) and study the relationships between immunological parameters by these groups.

The concentration of interleukin 17, interleukin 10 and vitamin D3 was measured by ELISA method [22-24].

## 3. Statistical Analysis

The statistical system (graphic bad version 5) was adopted as the T-analysis method was chosen [25].

### The Results and discussion

In our study, 60 samples of serum and whole blood specimens were collected from women which undergoing intracytoplasmic sperm injection technique that attended to fertility center in AL-Sadder Medical City in the Province of Najaf, AL-Najaf Health Directorate /Ministry of Health/Iraq, and 30 continuous pregnant women (control group)

## Results and Discussion Interleukin-10

It is noted from Figure No.1 that there is a significant increase in women who have spontaneously aborted when compared with the control group, This could be due to an increase in the level of white blood cells during pregnancy or naturally in aborted women, which is always accompanied by increased urinary and genital infections, which in turn leads to an increase in the level of interleukin-10 [26].

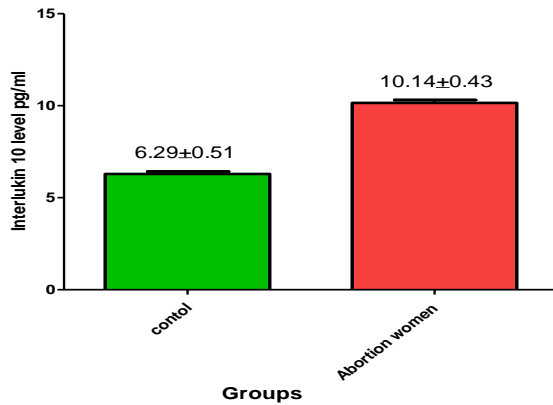


Figure No.1:show Interleukin 10 level that significant increase between the group of women with spontaneous abortion 60 and the continuing pregnant women (control group) who were 30 .

## Results and Discussion Interleukin-17

It is noted from Figure No.2 that there is a significant increase in women who have spontaneously aborted when compared with the control group, Vitamin D3 works to inhibit the secretion of cytokines such as IL 17 or IL 10 this is likely that the vitamin D3 may lead to a decrease in the effectiveness and function of cells, and consequently a lack of the vitamin D3 leads to a lack of cytokines [27-29].

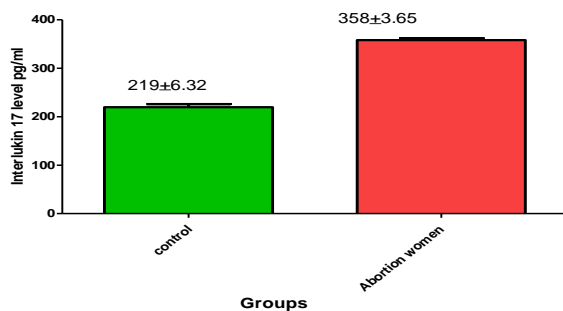


Figure No.2:show Interleukin 17 level that significant increase between the group of women with spontaneous abortion 60 and the continuing pregnant women (control group) who were 30 .

## Results and Discussion vitamin D3

It is noted from Figure No.3 that there is a significant in women who have spontaneously aborted when compared with the control group, The results of our study agree with previous studies that indicate the vital role of vitamin in successful pregnancy and fetal development, as vitamin D plays an important role in immunity and trophoblast invasion as it is also important for a healthy pregnancy, because it is related to calcium metabolism in the myometrium,

and it has a direct role In the production of antimicrobial peptides and may help prevent infection during pregnancy [30-32].

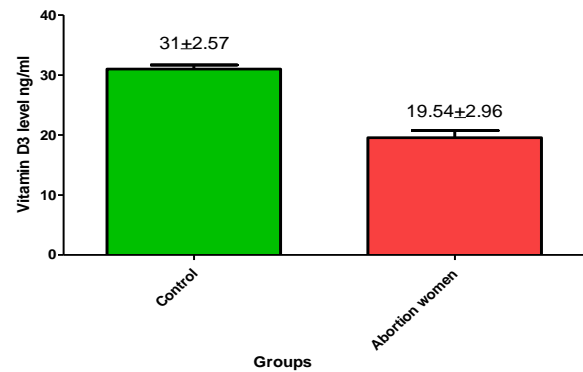


Figure No.3:show vitamin D3 level that no significant between the group of women with spontaneous abortion 60 and the continuing pregnant women (control group) who were 30 .

## 4. Conclusions

Through the results of our research, we conclude to the role of vitamin, as its deficiency leads to an increase in cytokines, and we find that this increase leads to miscarriage of pregnancy.

## References

1. Khalfa HM, Al-Msaid HL, Alsahlanee R. Relationship between vitamin D3 levels and marital status: A random study in females suffering from bone disorders in Al-Najaf province. *Journal of Medical and Life Science*. 2019;1(3):65-70. <https://doi.org/10.21608/jmals.2019.110859>
2. AL-Msaid HL, Khalfa HM. Relationship between interleukin 17 & 6 in patients with varicocele compare with a control group. *Journal of Medical and Life Science*. 2019;1(3):71-4. <https://doi.org/10.21608/jmals.2019.110862>
3. Caetano MR, Couto E, Passini Junior R, et al. Gestational prognostic factors in women with recurrent spontaneous abortion. *Sao Paulo Medical Journal*. 2006;124:181-5. <https://doi.org/10.1590/S1516-31802006000400002>
4. Mowbray J, Underwood J. Immunology of abortion. *Clinical and experimental immunology*. 1985;60(1):1. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1577006/>
5. AL-Msaid HL, AL-Sallami AS. Study the level of cytokine in unexplained and idiopathic infertile men. *Journal of Pharmaceutical Sciences and Research*. 2018;10(4):808-11. Available from: <https://www.researchgate.net/publication/324845254>
6. Almsaid H, Khalfa HM. The effect of Ketogenic diet on vitamin D3 and testosterone hormone in patients with diabetes mellitus type 2. *Current Issues in Pharmacy and Medical Sciences*. 2020;33(4):202-5. Available from: <https://sciendo.com/downloadpdf/journals/cipms/33/4/article-p202.xml>
7. Beck G, Habicht GS. Immunity and the invertebrates. *Scientific American*. 1996;275(5):60-6. Available from: <https://www.jstor.org/stable/24993447>

8. Shankar AH, Prasad AS. Zinc and immune function: the biological basis of altered resistance to infection. *The American journal of clinical nutrition*. 1998;68(2):447S-63S. <https://doi.org/10.1093/ajcn/68.2.447S>
9. Vazquez MI, Catalan-Dibene J, Zlotnik A. B cells responses and cytokine production are regulated by their immune microenvironment. *Cytokine*. 2015;74(2):318-26. <https://doi.org/10.1016/j.cyto.2015.02.007>
10. Trinchieri G. Interleukin-12: a cytokine produced by antigen-presenting cells with immunoregulatory functions in the generation of T-helper cells type 1 and cytotoxic lymphocytes. 1994. Available from: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.998.5728&rep=rep1&type=pdf>
11. Sadd BM, Schmid-Hempel P. Insect immunity shows specificity in protection upon secondary pathogen exposure. *Current Biology*. 2006;16(12):1206-10. <https://doi.org/10.1016/j.cub.2006.04.047>
12. Sun JC, Ugolini S, Vivier E. Immunological memory within the innate immune system. *The EMBO journal*. 2014;33(12):1295-303. <https://doi.org/10.1002/emboj.201387651>
13. Hine R. *Universities Press Dictionary Of Biology*. Universities Press, 1999.
14. Lafond J, Simoneau L. Calcium homeostasis in human placenta: role of calcium-handling proteins. *International review of cytology*. 2006;250:109-74. [https://doi.org/10.1016/S0074-7696\(06\)50004-X](https://doi.org/10.1016/S0074-7696(06)50004-X)
15. Brode S, Macary PA. Cross-presentation: dendritic cells and macrophages bite off more than they can chew! *Immunology*. 2004;112(3):345-51. <https://doi.org/10.1111/j.1365-2567.2004.01920.x>
16. Unanue ER, Allen PM. The basis for the immunoregulatory role of macrophages and other accessory cells. *Science*. 1987;236(4801):551-7. <https://doi.org/10.1126/science.2437650>
17. Bussel JB, Vander Haar EL, Berkowitz RL. New developments in fetal and neonatal alloimmune thrombocytopenia. *American Journal of Obstetrics and Gynecology*. 2021;225(2):120-7. <https://doi.org/10.1016/j.ajog.2021.04.211>
18. Saadaoui M, Kumar M, Al Khodor S. COVID-19 infection during pregnancy: risk of vertical transmission, fetal, and neonatal outcomes. *Journal of Personalized Medicine*. 2021;11(6):483. <https://doi.org/10.3390/jpm11060483>
19. Rasmussen M, Reddy M, Nolan R, et al. RNA profiles reveal signatures of future health and disease in pregnancy. *Nature*. 2022;601(7893):422-7. <https://doi.org/10.1038/s41586-021-04249-w>
20. Jeppesen LD, Hatt L, Singh R, et al. Cell-based non-invasive prenatal diagnosis in a pregnancy at risk of cystic fibrosis. *Prenatal Diagnosis*. 2021;41(2):234-40. <https://doi.org/10.1002/pd.5861>
21. Jääskeläinen T, Kärkkäinen O, Jokkala J, et al. A non-targeted LC-MS metabolic profiling of pregnancy: longitudinal evidence from healthy and pre-eclamptic pregnancies. *Metabolomics*. 2021;17(2):1-12. <https://doi.org/10.1007/s11306-020-01752-5>
22. Condrat CE, Varlas VN, Duică F, et al. Pregnancy-related extracellular vesicles revisited. *International journal of molecular sciences*. 2021;22(8):3904. <https://doi.org/10.3390/ijms22083904>
23. Mohammed RJ, Salih LA. The Correlation between Maternal Vitamin D and Interleukin-17 Levels and Fetal Biophysical Profile. *Iraqi Journal of Science*. 2021:1836-42. <https://www.iasj.net/iasj/download/f748c25c344a9087>
24. Gupta A, Gupta S, Mani R, et al. Expression of Human epidermal growth factor receptor 2, Survivin, Enhancer of zeste homolog -2, Cyclooxygenase-2, p53 and p16 molecular markers in Gall bladder carcinoma. *J Carcinog*. 2021;20:7. [https://doi.org/10.4103/jcar.jcar\\_4\\_21](https://doi.org/10.4103/jcar.jcar_4_21)
25. Renai L, Ancillotti C, Ulaszewska M, et al. Comparison of chemometric strategies for potential exposure marker discovery and false-positive reduction in untargeted metabolomics: application to the serum analysis by LC-HRMS after intake of Vaccinium fruit supplements. *Analytical and Bioanalytical Chemistry*. 2022;414(5):1841-55. <https://doi.org/10.1007/s00216-021-03815-5>
26. Cubro H, Nath KA, Suvakov S, et al. Mechanisms of vascular dysfunction in the interleukin-10-deficient murine model of preeclampsia indicate nitric oxide dysregulation. *Kidney international*. 2021;99(3):646-56. <https://doi.org/10.1016/j.kint.2020.09.034>
27. Zhu LY, Chen MP. Association Study between Proinflammatory Cytokine Gene Polymorphism and Risk of Recurrent Spontaneous Abortion. *Indian Journal of Pharmaceutical Sciences*. 2021:99-103. <https://doi.org/10.36468/pharmaceutical-sciences.spl.259>
28. AL-Msaid HL, Waleed A, AL-Sallami AS. Relationship Between Hyperviscosity and Sex Hormone in Azoospermia and Oligozoospermia Patients Compares with The Control Group. Available from: <https://www.researchgate.net/publication/348792747>
29. Arliny Y, Yunus F, Burhan E, et al. Diagnostic predictors of active tuberculosis infection in diabetic patients with latent tuberculosis: A review on cathelicidin and 1, 25-dihydroxyvitamin D [sub] 3. *J Nat Sci Biol Med*. 2021;12(1):117-23. [https://doi.org/10.4103/jnsbm.JNSBM\\_26\\_20](https://doi.org/10.4103/jnsbm.JNSBM_26_20)
30. Baqer NN, Saheb EJ, Ahmed NS, et al. The association of IL-3, IL-17A, and IL 27 serum levels with susceptibility to toxoplasmosis in recurrent abortion of Iraqi women. *Experimental Parasitology*. 2022;234:108217. <https://doi.org/10.1016/j.exppara.2022.108217>
31. Chen C, Wang S, Zhang C, et al. Association between serum vitamin D level during pregnancy and recurrent spontaneous abortion: a systematic review and meta-analysis. *American Journal of Reproductive Immunology*. 2022. <https://doi.org/10.1111/aji.13582>
32. Chen Y, Wu Q, Wei J, et al. Effects of aspirin, vitamin D3, and progesterone on pregnancy outcomes in an autoimmune recurrent spontaneous abortion model. *Brazilian Journal of Medical and Biological Research*. 2021;54. <https://doi.org/10.1590/1414-431X2020e9570>