

## 2<sup>nd</sup> International Conference on **Gynecology & Obstetrics**

November 16-18, 2015 San Antonio, USA

### **The effect of clomiphene citrate with and without zinc oxide nanoparticles on the reproductive parameters and gonadotropin hormones of adult female rats**

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This research was carried out to determine the effects of clomiphene citrate (CC) with and without zinc oxide nanoparticles (ZnO-NPs) on the reproductive parameters, gonadotropin hormones, T3 and T4 concentration in adult female rats. A total of 32 female rats (weighing between 195-205g and 80-90 days age) divided into a completely randomized design consisted of four groups of 4 rats with four replicates and 2 rats in each. Experimental groups were as follow: G1) Control (received normal pellet diet and water as ad libitum), G2) 5mg ZnO-NPs, G3) 0.5 mg CC, and G4) 5mg ZnO-NPs+0.5 mg CC per kg of body weight. ZnO-NPs and CC was gavaged to the rats two sexual periods of female rats. At the final trial, all experimental one rat (per replicate) anesthetized by ether solution, and then the blood samples and ovaries rats were collected. Serum removed by centrifuging (3000 g, 20 min at 4° C) and stored in -20°C until analysis. The follicles number and type were recorded with physical dissector technique. The results revealed that the secondary follicles number had significantly ( $P=0.0491$ ) increased in rats were gavaged with CC (G1) and the blend of CC and ZnO-NPs (G4) compared with the control and other treatment. The number of follicles graffian in rats that gavaged with the CC plus ZnO-NPs (G4) was more than other groups ( $P=0.0138$ ). The level of LH had significantly increased in the group that treated with CC compared to the control while the level of FSH had significantly increased in the treated rats with the combination of CC and ZnO-NPs in comparison with the control. According to the results, it could be concluded that the blend of CC and ZnO-NPs related to using those alone, improved reproductive parameters and increased gonadotropin hormones. Hence, this condition may be improving fertility rate in the rats.

**Keywords:** Hormones, Nanoparticles, clomiphene citrate, Ovary, Rat.

#### **Biography**

Fariba Rahimi had completed BSc from Yazd University, Iran. Afterward, She had continued study to earn Master of Science in Physiology from the Science and Research Branch, Islamic Azad University, Tehran, Iran in 2014. She is currently a Master of Science Physiology at Islamic Azad University in Kurdistan, Iran. Fariba is currently serving as a lecturer at the Kurdistan Azad University in the department of nursing and midwifery.

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