

Sitagliptin Increases the FAI in PCOS

Daneshjou D^{1*}, Soleimani Mehranjani M¹, Zadehmodarres Sh², Shariatzadeh SMA¹,

1. Department of Biology, Faculty of Science, Arak University, Arak, Iran.

2. Men's Health and Reproductive Health Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
Email: d.daneshjou@yahoo.com

Introduction

Polycystic ovary syndrome (PCOS) is a highly prevalent disorder, the etiology of which is not well understood (1). On the other hand, hyperandrogenism is the common biochemical abnormality in women with PCOS. Most of PCOS Studies have focused on the evaluation and treatment of hirsutism, acne, alopecia, and infertility, health issues that are generally of greatest relevance to PCOS(2). Also, PCOS patients often suffer from a glucose homeostasis disorder, insulin resistance, and obesity and are susceptible to type 2 diabetes. There is a hypothesis that insulin plays a role in the hyperandrogenism of women with PCOS(3). Sitagliptin, as an oral anti hyperglycemic agent uses in treatment of type 2 diabetes, is considered recently in clinical investigations of PCOS and can affect this patients in different ways(4,5).

The aim of the present study was to evaluate the effect of sitagliptin on the free androgen index (FAI) in patients with PCOS undergoing intracytoplasmic sperm injection (ICSI).

Method and Material

In this clinical trial, 40 infertile PCOS patients were selected based on the Rotterdam criteria; Then they divided into 2 groups (n=20): sitagliptin group (Januvia, Merck, West Drayton, UK; 50 mg, twice a day) and placebo group. All patients were undergoing treatment with antagonist GnRH protocol. Treatment was carried out two months before the start of the ovulation cycle and continued until the day of oocyte aspiration. Total testosterone and sex hormone binding globulin (SHBG) concentrations in blood serum were assayed. To calculate the FAI, total testosterone value x 100 is divided by the SHBG value.

Result

Serum level of total testosterone significantly decreased in sitagliptin group (3.51 ± 1.03 vs. 5.32 ± 1.41 , $p=0.001$). SHBG level increased in sitagliptin group (50.11 ± 7.15 vs. 47.88 ± 8.74) but this differences was not significant ($p>0.05$). Hence, FAI was significantly decreased after treatment with sitagliptin (7.03 ± 1.77 vs. 1.10 ± 1.80 , $p=0.001$) (Figure1).

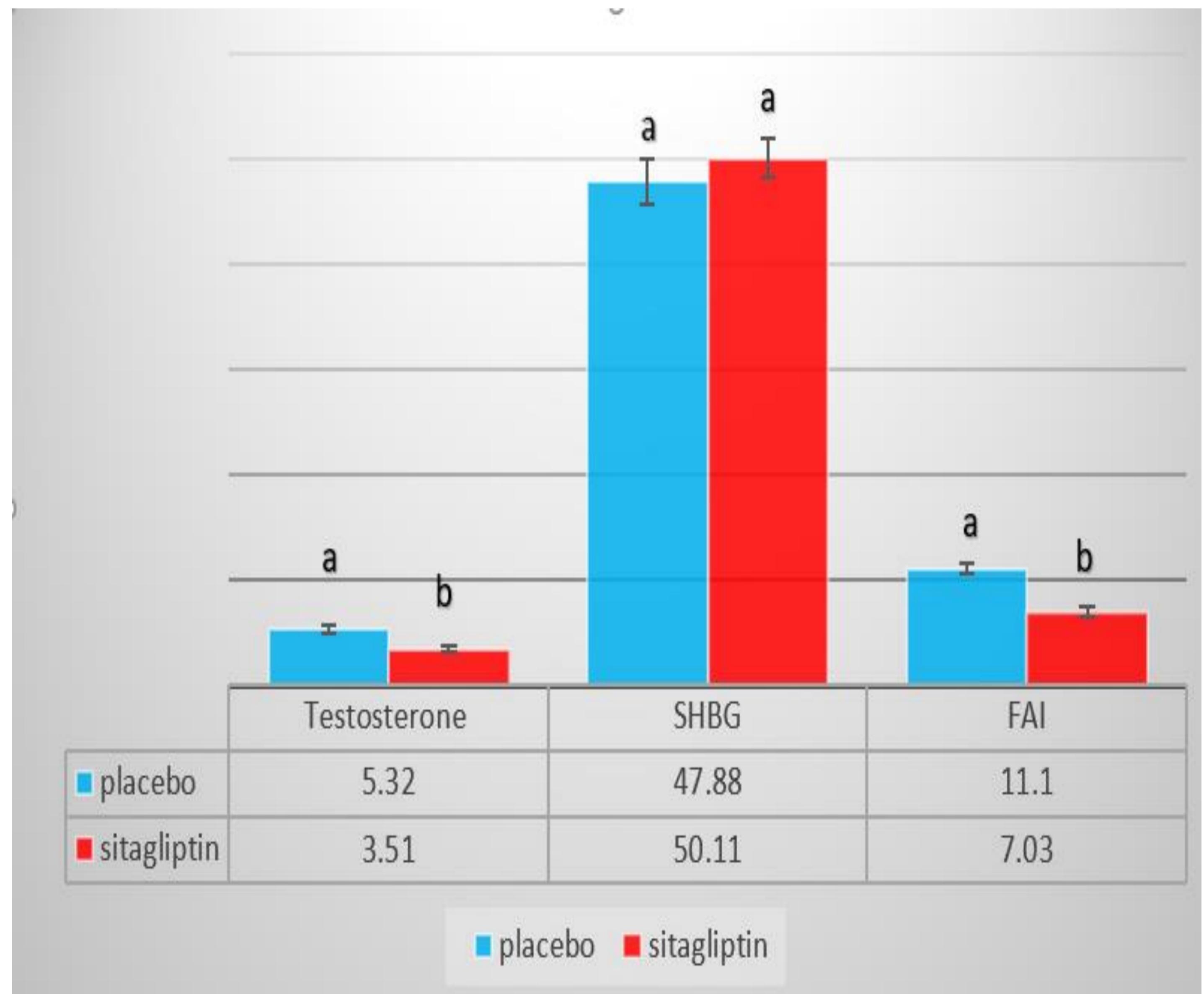


Fig.1: Distribution of total testosterone, SHBG and FAI in PCOS patients undergoing treatment of sitagliptin and placebo. Means with different letter code have significant difference and means with similar letter code have no significant difference with each other

Conclusion

Our obtained result from this clinical study showed that sitagliptin can decrease the FAI index in women with infertility due to PCOS. Therefore it seems that sitagliptin has therapeutic efficiency for treatment of PCOS

Reference

- 1- Barthelmess, E. K., & Naz, R. K. (2014). Polycystic ovary syndrome: current status and future perspective. *Frontiers in bioscience (Elite edition)*, 6, 104.
- 2- Azziz, R., Carmina, E., Dewailly, D., Diamanti-Kandarakis, E., Escobar-Morreale, H. F., Futterweit, W., ... & Witchel, S. F. (2009). The Androgen Excess and PCOS Society criteria for the polycystic ovary syndrome: the complete task force report. *Fertility and sterility*, 91(2), 456-488.
- 3- Yao, K., Bian, C., & Zhao, X. (2017). Association of polycystic ovary syndrome with metabolic syndrome and gestational diabetes: Aggravated complication of pregnancy. *Experimental and therapeutic medicine*, 14(2), 1271-1276.
- 4- Palma, J. P., Byhen, E. L., Ibáñez, L., Macedo, L. B., Palma, C. P., & Velázquez, C. R. (2018). Comparative treatment between sitagliptin vs. metformin, alone or in combination, in patients with polycystic ovary syndrome. A clinical entity at high risk for developing diabetes mellitus and gestational diabetes: A pilot study. *Revista Médica del Hospital General de México*, 81(1), 15-26.
- 5- Daneshjou, D., Modarres, S. Z., & Mehranjani, M. S. (2020). Comparing the effect of sitagliptin and metformin on the oocyte and embryo quality in classic PCOS patients undergoing ICSI. *Irish Journal of Medical Science* (1971-), 1-8.

Acknowledgement

The authors thank the infertility clinic of Mahdiyeh educational hospital (Tehran, Iran) and also the research laboratory of Arak University (Arak, Iran). This study was financially supported by the Arak University and the Men's Health and Reproductive Health Research Center of Shahid Beheshti University of Medical Sciences.