Letter to the Editor

The Impact of Ramadhan Fasting in Women with PCOS: an Association Between FPG and Lipid Profiles

Dear Editor,

It is an interesting article by Asemi *et al.*[1] published in this journal in December 2015. The authors investigated the impact of Ramadan fasting in women with polycystic ovary syndrome (PCOS) with respect to their metabolic status. This study is very valuable for muslim women suffering from PCOS. Nevertheless, there are numerous important points which remain unclear regarding the results.

PCOS is the most common endocrine disorders affecting women in reproductive age.[2] It is defined as a syndrome of PCO (polycystic ovaries)-diagnosed by ultrasonography, as well as at least one symptom of hyperandrogenism.[3] Scientific evidence suggests that PCOS has a significant association with inflammation,[4] dyslipidemia, insulin resistance,[5] both type 2 and gestational diabetes mellitus, and cardiovascular disease.[6]

In the article published by Asemi *et al*., the authors observed that FPG (fasting plasma glucose) changed insignificantly before and after Ramadan, which were 97.55 ± 6.36 and 95.03 ± 9.74, respectively, describing that the majority of samples had considerably normal FPG levels (prediabetes category 100–125 mg/dL).[7] From our point of view, the insignificant result is probably due to the normal glucose metabolism of patients involved in the study. In fact, not all women with PCOS in reproductive age have abnormalities in glucose metabolism. Koh *et al.* reported that few women with PCOS were considered as normal FPG (<100 mg/dL); even they, however, found that over one third of study samples were undetected by FPG measurement although the samples were found to have abnormalities in glucose tolerance assessed by oral glucose tolerance test.[8]

In addition, the article's result showed the insignificant alterations of lipid parameters, which are cholesterol and a variety of fatty acids, between pre- and post-ramadan fasting. In fact, the association between insulin resistance, hyperandrogenism, obesity in PCOS has been established and each of these parameters independently affects dyslipidemia, although this theory is still less understood.[9] However, it seems that the result might show a relationship between lipid parameters and FPG concentration and the plausible bridge in both parameters is whether there is a presence of insulin resistance, due to the fact suggested by Teede *et al*. that it may have an important effect on metabolic features in patients with PCOS.[10]

In conclusion, we could not agree more that larger studies must be conducted to confirm the finding. Moreover, the present study has a fundamental contribution to future studies with respect to investigating the association among FPG, insulin resistance and lipid profiles in women with PCOS.

References

1. Asemi Z, Samimi M, Taghizadeh M, Esmaillzadeh A. Effects of Ramadan Fasting on Glucose Homeostasis, Lipid Profiles, Inflammation and Oxidative Stress in Women with Polycystic Ovary Syndrome in Kashan, Iran. *Arch Iran Med*. 2015; 18(12); 806 – 810.
2. Duncan WC. A guide to understanding polycystic ovary syndrome (PCOS). *J Fam Plann Reprod Health Care*. 2014; 40(3): 217 – 225.
3. Kovacs G, Briggs P. *Polycystic Ovaries (PCO) and Polycystic Ovarian Syndrome (PCOS)*. In Lectures in Obstetrics, Gynaecology and Women's Health. Swetzeland: Springer; 2015; 87 – 89.
4. Duleba AJ, Dokras A. Is PCOS an inflammatory process? *Fertil Steril*. 2012; 97(1): 7 – 12.
5. Xiang SK, Hua F, Tang Y, Jiang XH, Zhuang Q, Qian FJ. Relationship between Serum Lipoprotein Ratios and Insulin Resistance in Polycystic Ovary Syndrome. *Int J Endocrinol*. 2012; 2012: 173281.
6. Cussons AJ, Stuckey BGA, Watts GF. Cardiovascular disease in the polycystic ovary syndrome: new insights and perspectives. *Atherosclerosis*. 2006; 185(2); 227 – 239.
7. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 2014; 37(S*uppl 1): S81* – S90.
8. Koh AR, Lee SJ, Park SY, Kim MK, Kim JY, Lee KW, Kim KH. Predictors of abnormal glucose tolerance among women with polycystic ovary syndrome. *Korean J Obstet Gynecol*; 2012; 55: 477 – 484.
9. Diamanti-Kandarakis E, Papavassiliou AG, Kandarakis SA, Chrousos GP. Pathophysiology and types of dyslipidemia in PCOS. *Trends Endocrinol Metab*. 2007; 18(7): 280 – 285.
10. Teede HJ, Hutchison S, Zoungas S, Meyer C. Insulin resistance, the metabolic syndrome, diabetes, and cardiovascular disease risk in women with PCOS. *Endocrine*. 2006; 30: 45 – 53.

Muhammad Firman Akbar MD, M.MedSc•[1], Muhammad Rizkinov Jumsa MD[2]

Authors' affiliations: [1]Clinician, Department of General Health Services, Sahabat Sehat Clinic, West Nusa Tenggara, Indonesia. [2]Resident, Department of Obstetrics & Gynecology, Faculty of Medicine University of Hasanuddin, Indonesia

•Corresponding author and reprints: Muhammad Firman Akbar MD, M.MedSc, Clinician, Department of General Health Services, Sahabat Sehat Clinic, West Nusa Tenggara, Indonesia. E-mail: m.f.akbar@dr.com; mfakbar@connect.hku.hk.

Reply;

Dear Editor;

In our recent article[1] entitled "effects of Ramadan fasting on glucose homeostasis, lipid profiles, inflammation and oxidative stress in women with Polycystic Ovary Syndrome (PCOS) in Kashan, Iran", we concluded that Ramadan fasting for 4 weeks in women with PCOS had beneficial effects on nitric oxide and plasma glutathione levels, but it did not affect glucose hemostasis parameters, lipid profiles or total antioxidant capacity. We thank Akbar and Jumsa [2] for their interest in our article. They believe that "the insignificant results in fasting plasma glucose (FPG) are probably due to normal glucose metabolism of patients involved in the study". We agree with them that not all women with PCOS are suffering from abnormalities in glucose metabolism. In our study, 11 of 27 women with PCOS had prediabetes (100–125 mg/dL) and 16 had normal glucose levels. As they implied, this might explain lack of finding a significant effect on plasma glucose levels. It seems that the effect of Ramadan fasting is greater among people with elevated glucose levels, including diabetics, than those with near-normal concentrations. We did not also find a significant effect of Ramadan fasting on lipid concentrations. As Akbar and Jumsa [2] pointed out, this might also be explained by the complex relations between insulin resistance, glucose homeostasis, hormonal balance and lipid concentrations. Although we did not examine the existence of insulin resistance in our study participants, it seems that most women with PCOS are already insulin-resistant. In addition, the majority of PCOS women in our study had near-normal levels of lipid profiles. This might also

provide an additional reason for not finding a significant effect on lipid concentrations. Our findings were in accordance with other studies that had demonstrated no alterations in lipid profiles during Ramadan in healthy volunteers.[3–4] However, as Akbar and Jumsa [2] mentioned, larger studies must be conducted to confirm these finding. It must also be kept in mind that the high standard deviations (SDs) of dependent variables in some cases such as lipid profiles, high-sensitivity C-reactive protein and biomarkers of oxidative stress might make the interpretation of our findings difficult. Such high SDs might be explained by the small number of participants in the study, which was a limitation.

References

1. Asemi Z, Samimi M, Taghizadeh M, Esmaillzadeh A. Effects of Ramadan Fasting on Glucose Homeostasis, Lipid Profiles, Inflammation and Oxidative Stress in Women with Polycystic Ovary Syndrome in Kashan, Iran. *Arch Iran Med*. 2015; 18(12): 806 – 810.
2. Akbar MF, Jumsa MR. The impact of Ramadan fasting in women with PCOS: an association between FPG and lipid profiles. 2016.
3. Aksungar FB, Eren A, Ure S, Teskin O, Ates G. Effects of intermittent fasting on serum lipid levels, coagulation status and plasma homocysteine levels. *Ann Nutr Metab*. 2005; 49(2): 77 – 82.
4. Aksungar FB, Topkaya AE, Akyildiz M. Interleukin-6, C-reactive protein and biochemical parameters during prolonged intermittent fasting. *Ann Nutr Metab*. 2007;51(1): 88 – 95.

Zatollah Asemi MD[1], Ahmad Esmaillzadeh MD[•2,3,4]

Authors' affiliations: [1]Research Center for Biochemistry and Nutrition in Metabolic Diseases, Kashan University of Medical Sciences, Kashan, I.R. Iran. [2]Food Security Research Center, Isfahan University of Medical Sciences, Isfahan, Iran. [3]Department of Community Nutrition, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran. [4]Department of Community Nutrition, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences, Tehran, Iran.

•Corresponding author and reprints: Ahmad Esmaillzadeh PhD, Department of Community Nutrition, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan P.O. Box: 81745-151, Iran, Tel: +98-311-7922720, Fax: +98-311-6681378, E-mail: Esmaillzadeh@hlth.mui.ac.ir