Title: Effects of Greek Orthodox Christian Church fasting on serum lipids and obesity.

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Reviewer: Prof Shraga Shany

Level of interest: A paper of considerable general medical or scientific interest

Advice on publication: Accept after discretionary revisions

This paper deals with the impact of the Greek Orthodox Christian fasting practices on lipoproteins and obesity. The authors used two levels of comparisons. On the first level, lipoprotein profile, obesity and other parameters were compared between a group of 60 fasters and aged and sex matched non-fasters group. Another comparison was made within the fasting group between pre and the post fasting data. The authors concluded that adherence to Greek Orthodox fasting periods results in a reduction in blood lipid values and in obesity. The article compares and discusses the impact of other vegetarian diets and other religious fasting periods on health.

The present paper deals with a very important subject that may affect public health. This article is suitable for publication, only after the required changes, corrections and clarifications, are made.

Comments:

1. The Greek Orthodox Christian fasting periods represent changes in diet rather than a real fast. Besides the general declaration that meat was replaced by fruits, vegetables and legumes, or that fish were replaced by other sea fruits, there are no quantitative details concerning these changes. Moreover, the possible changes in total calories intake is neither described and nor discussed.

2. There is no description concerning physical activity during the fasting periods. Reduction in physical activity during these periods might explain the slight, although not significant, reduction in HDL-C levels.

3. Serum triglycerides levels are not presented, although these values were taken into account in the LDL-C calculations. The use of the Friedewald equation for the LDL-C calculation, as was carried out in this study, is suitable only in the case of normal or in limited increase in serum triglycerides levels. Therefore, it is important to present these data.

4. There is a gender difference between the groups. The control group is composed of 36 women while the fasting group contains only 29. Although no age distribution of the women is noted, it may be concluded from the average age of each group that the women are in their reproductive age. In this age their total cholesterol as well as their LDL-C serum levels tend to be lower that in men. The unequal number of women in the tested groups may alter the results.
5. A significant difference in the number of smokers exist in the comparison between the tested groups.

6. I am not certain that calculating the means of the lipoproteins data before and following the three annual fasting periods is a good idea. The fasts are different in length, season and possibly in diet. I believe that more accurate results could be obtained by comparing separately the pre and post fasting data.

7. From the footnote of Table 2 it is understood that only 71 subjects out of the 120 participants had all 6 measurements. If this is true, it should be emphasized that the regression analysis was carried out only on this number. I also believe that BMI should be gender analyzed.

8. Both fasters and non-fasters are in the overweight range. BMI of 27 for fasters and 27.6 for non-fasters. This fact limits of course the significance of the results for the general population.

9. While no significant difference in T.Cho/HDL-C ratios were determined in the comparison between the fasting and non-fasting groups, a significant decrease in LDL-C/HDL-C ratios in the fasting group was reported (Table 3). This discrepancy may be explained by the fact that LDL-C values in this study, are calculated rather than directly measured. As a result, all laboratory mistakes are concentrated on this value. Moreover, a bias may be caused by including data with high levels of triglycerides in the calculation of LDL-C levels (See comment 3). This may put a question mark on the validity of the LDL-C results in this study.

10. There are differences between tables 3 and 4 in T.Cho, BMI, T.Cho/HDL-C and LDL-C/HDL-C values for the fasting group on the end of the fast. I assume that these differences are a result of including different participants numbers in each table. This fact is not mentioned in the article and the reason for it is not explained.

11. In the discussion chapter it is mentioned that T.Cho/HDL-C and LDL-C/HDL-C ratios in Barnard et al study remained unchanged during the diet changes. The authors of the present study claim that these results contradict theirs. The results on Table 4 are in full agreement with Barnard et al data and the same is true for the T.Cho/HDL-C ratio presented on Table 3.

12. Not all comparisons with the literature made in the discussion chapter are valid, since the authors of the present article failed to provide information concerning the “vegetarian” diet during the fasting periods.

Competing interests:

None declared.