Daud Fasting Effects on Haematological, Renal and Lipid Profile in Post Menopausal Women

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ABSTRACT

Background: The health benefits of Ramadan fasting have been extensively researched. Nevertheless, this fasting is only done in the month of Ramadan. Daud fasting then becomes an alternative to Sunnah fasting, to be performed outside the month of Ramadan. However, there is concern regarding the possibility of adverse effects of Daud fasting, especially for the elderly.

Aims: The purpose of this study is to find out the effects of Daud fasting on haematological parameters, renal function, urine ketones and lipid profile in post-menopausal women.

Methods: This research is quasi-experimental. The research subject consisted of two groups, one group consisting of nine post-menopausal women who performed Daud fasting, and the other group of ninepost-menopausal women who did not fast. Blood and urine sampling was done before fasting (first day) and last day of fasting (day 22nd). The data were analysed using a paired T test and Wilcoxon test, and then the independent T test to discover the differences between the two groups.

Results: Daud fasting did not result in any complaints for post-menopausal women. There were no differences to the routine blood parameters, renal function, urine ketones and Low Density Lipoprotein Cholesterol (LDL-C) levels between the groups of post-menopausal women who fast and do not. However, High Density Lipoprotein Cholesterol (HDL-C) levels were decreased significantly.

Conclusion: In a healthy condition, Daud fasting is safe to be performed by post-menopausal women. There were no differences to the routine blood parameters, renal function, urine ketones and Low Density Lipoprotein Cholesterol (LDL-C).

Key words: Daud fasting, post-menopause, haematological parameters, renal function, lipid profile

INTRODUCTION

Fasting is a religious ritual carried out by many religious communities around the world. Fasting in Islam involves abstaining from eating, drinking and doing jima' from dawn until sunset, with the intention of obeying God's command. In Islamic law, fasting is categorised into two groups, namely obligatory fasting and Sunnah fasting. An example of obligatory fasting is Ramadan fasting, while examples of Sunnah fasting are that performed in six days in Shawwal, Arafat fasting, three-day fasting in every mid-month, fasting on Mondays and Thursdays, Daud fasting and fasting in the month of Sha`ban. When Moslems perform fasting with a pure and sincere intention only because of Allah, they will feel the lessons and benefits of fasting, both for their physical and spiritual condition1.

There has been some research on the usefulness of Ramadan fasting for health, such as weight loss and the amelioration of lipid profile. Ramadan fasting has an important role in controlling blood pressure, gastric, diabetes and smoking habits. In healthy people, Ramadan fasting improves insulin sensitivity. This fasting may also be beneficial to boost mood, while Sunnah fasting on Mondays and Thursdays improves the quality of life. However, in Islam, Ramadan fasting outside the month of Ramadan is not allowed.

Daud fasting was often done by the Prophet David (Daud), i.e. fasting on one day and not fasting on the next day. The Prophet Muhammad once said that Daud fasting has more of the virtue of Sunnah fasting than others. It is also explained by Amr bin Aus that he had heard from Abdullah bin Amr Ibn Ash that the Prophet Muhammad once narrated as written by H.R. Bukhori:

Fast one day and break on the other day, that is (known as) the fasting of Daud (AS). And that is the best fasting. I (Abdullah bin Amr ra.) said: "I am capable of doing more than this," Thereupon the Messenger of Allah (SAW) said: “There is nothing better than this.”

There has been no study of Daud fasting by the elderly. The functions of many organ systems decrease in the elderly (e.g., saliva production).
Glucose levels become higher than normal because energy metabolism reduces in the liver. They are at risk of many degenerative diseases and malnutrition. This makes fasting a matter of concern. However, the decreased activity in the elderly causes an increase in body fat. Therefore, the purpose of this study is to determine the effect of Daud fasting on haematological parameters, renal function, urine ketones and lipid profiles in post-menopausal women.

METHODS

The research design was a quasi-experimental. The study obtained a letter of ethical eligibility from the Research Ethics Committee of the Faculty of Medicine of UII number 20/Ka.Kom.Et/70/KE/V/2015. The research population consisted of a group of geriatrics in Kalasan, Sleman, Yogyakarta, Indonesia. The subject was determined by using convenient sampling that met the inclusion and exclusion criteria. The inclusion criteria were healthy women who were post-menopausal, performing Daud fasting for 22 days (11 days of fasting: day 2nd, day 4th, until day 22nd). Daud fasting is abstaining from eating, drinking and sexual intercourse from dawn until sunset. The exclusion criteria were taking medicine for dyslipidaemia within the last 3 months, taking vitamin C within the last 2 weeks, drinking alcohol, smoking and suffering from a specific illness. A total of 18 post-menopausal women were enrolled, 9 women who performed Daud fasting and 9 women did not fast. All the participants had signed an informed consent form. During fasting, subjects were followed up by phone every week to check for any side effects.

Blood sampling in fasting group was done before fasting (first day) at 7 am before breakfast and last day of fasting (day 22nd) at 5 pm. Blood sampling on non-fasting group was performed on the first day and the 22nd day at 7 am before breakfast. All the samples were sent to the laboratory of the clinical pathology RSUP Dr Sardjito. The haematological examination used the automatic haematology analyser (Sysmex Xn1000) with impedance method. The analysis of lipid profile, creatinine and Blood Urea Nitrogen (BUN) used a spectrophotometer (Cobas 6000) with CHOD-PAP method for lipid profile analysis, enzymatic uricase methods for BUN analysis and Jaffe reaction on the examination of creatinine levels. Meanwhile, urine ketones used rapid test methods.

Descriptive statistics were indicated by mean and standard deviation (95% confidence interval). The data analysis used the Paired-samples T test and Wilcoxon rank-sum test (depend on data distribution) to find out about changes in haematological parameters, renal function, weight and Body Mass Index (BMI) before and after Daud fasting for 22 days, as well as Fisher’s exact test for the urine ketones parameter. The difference between fasting group and non-fasting group was examined by Independent-samples T test, or Mann-Whitney U test (depend on data distribution).

RESULTS

There were 23 subjects willing to participate in this research. Medical examinations were made of these 23 people, and 18 of those, with ages ranging from 49 to 64 years, were selected. Both groups had no history of chronic disease, and the results of the examination of blood pressure, electrocardiogram (ECG) and blood sugar were normal. There was no difference in the average of age, blood pressure and blood sugar levels between the fasting group and non-fasting group. The predominant educational level of the fasting group was senior high school, while the non-fasting group was mostly junior high school. The employment status of the fasting group was mostly housewife, and that of the non-fasting group was equally housewife/entrepreneur (Table 1).

The group of post-menopausal women who fasted did not experience any significant complaints, such as dizziness, weariness or dehydration. The respondents could perform activities as usual. The results of the blood chemistry test on the last day of fasting show that Daud fasting did not cause any changes or abnormal values of blood chemistry. Means of BUN level, serum creatinine level and urine ketones of the fasting group were normal. Changes in the levels of BUN, creatinine and urine ketones, compared to the non-fasting group, were not significant (Table 2).

Twenty-two days of Daud fasting significantly (p<0.05) reduced weight, BMI, and the levels of LDL-C, respectively 1.15±1.2kg; 0.49±0.55kg/m² and 2.67±13.95mg/dl (Table 2). However, the changes in body weight, BMI and LDL-C levels did not differ from the respondents who did not fast. Lipid profile for HDL-C after Daud fasting significantly decreased (p = 0.015) and was significantly different from the group that did not fast, since their levels of HDL-C were increased (Table 2). There was no change in the haematological parameters before and after fasting, and there was no difference from the subjects who did not fast (Table 3).
**DISCUSSION**

The findings of this study indicate that Daud fasting by the elderly does not lead to excessive gluconeogenesis effects and metabolic acidosis. It was noted that the urine ketones in the fasting group were still within normal limits and participants did not feel physically weak. Previous studies showed an increase of fatty acid synthesis and gluconeogenesis enzyme in the elderly who fasted\(^ {12} \) so the urine ketones in the elderly who fasted were higher than in young adults\(^ {13} \). The longer the fasting time, the higher the levels of ketones\(^ {14} \). However, Daud fasting was only performed for 14 hours, so it has not led to an increased level of ketones. These results show that the ratio of BUN to creatinine was above 12 mg/dl, meaning that there was no liver failure, no low-protein diet or no hunger\(^ {15} \). On the day of fasting, participants ate and drank at 4 am and 6 pm. Unfortunately, the limitations of this study did not calculate the proportion of water, fat, protein and carbohydrate intake.

Daud fasting in the elderly did not lead to dehydration or a decline in renal function. BUN and creatinine levels are still within normal limits. In addition, they were not significantly different between the fasting and non-fasting groups. Previous research on young adults performing Ramadan fasting shows that there is no change in urea or creatinine levels\(^ {16} \). Even in patients with kidney transplants, there is no difference before and after Ramadan fasting\(^ {17} \) and there is no difference with patients undergoing kidney transplantation who do not fast\(^ {18} \). Research on the elderly shows an increase in BUN and creatinine after Ramadan fasting in those with cardiovascular disease risk but still within the normal limits\(^ {19} \). Ramadan fasting is abstaining from food and drink from sunset to sunrise every day during one month but Daud fasting is only every other day.

**Table 1** Baseline characteristics of subjects (n=18)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Fasting</th>
<th>No fasting</th>
<th>p</th>
<th>p²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>55.11±3.96</td>
<td>56.67±5.57</td>
<td>0.5*</td>
<td>0.036*</td>
</tr>
<tr>
<td>Last education level</td>
<td>Senior High school</td>
<td>Junior High School</td>
<td>0.124*</td>
<td>0.328</td>
</tr>
<tr>
<td>Occupation</td>
<td>housewife</td>
<td>Housewife/entrepreneur</td>
<td>1c</td>
<td>0.209</td>
</tr>
<tr>
<td>Systolic blood pressure, mmHg</td>
<td>120±11.18</td>
<td>132.89±30.14</td>
<td>0.67a</td>
<td>0.31</td>
</tr>
<tr>
<td>Diastolic blood pressure, mmHg</td>
<td>72.22±6.67</td>
<td>71.11±6</td>
<td>0.73b</td>
<td>0.374</td>
</tr>
</tbody>
</table>


**Table 2** Changes in anthropometry and blood chemistry, fasting group and non-fasting group

<table>
<thead>
<tr>
<th></th>
<th>Fasting</th>
<th>Non-fasting</th>
<th>p</th>
<th>p²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight, kg</td>
<td>53.8±7.2</td>
<td>52.64±8.45</td>
<td>-1.15±1.28</td>
<td>0.31</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>22.84±2.93</td>
<td>22.35±3.31</td>
<td>-0.49±0.55</td>
<td>0.3</td>
</tr>
<tr>
<td>LDL-C, mg/dl</td>
<td>139.44±26.63</td>
<td>136.78±20.04</td>
<td>-2.13±19.5</td>
<td>0.34</td>
</tr>
<tr>
<td>HDL-C, mg/dl</td>
<td>65.44±17.63</td>
<td>57.44±10.06</td>
<td>-8.27±7.87</td>
<td>0.34</td>
</tr>
<tr>
<td>BUN, mg/dl</td>
<td>11.73±4.15</td>
<td>12.73±2.2</td>
<td>1±3.6</td>
<td>0.72</td>
</tr>
<tr>
<td>Creatinine, mg/dl</td>
<td>0.8±0.18</td>
<td>0.84±0.12</td>
<td>0.037±0.13</td>
<td>0.2</td>
</tr>
<tr>
<td>Urine ketones</td>
<td>negative</td>
<td>positive</td>
<td>0.12</td>
<td>0.471</td>
</tr>
</tbody>
</table>

*The difference between fasting and non-fasting (Independent-samples T test, Mann-Whitney U test or Fisher test)

**Table 3** Changes in haematology parameter

<table>
<thead>
<tr>
<th></th>
<th>Fasting</th>
<th>Non-fasting</th>
<th>p</th>
<th>p²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucocyte, /mm³</td>
<td>6.45±1.41</td>
<td>6.84±1.2</td>
<td>0.39±1.13</td>
<td>0.25</td>
</tr>
<tr>
<td>Erythrocyte, /mm³</td>
<td>4.15±0.42</td>
<td>4.22±0.44</td>
<td>0.07±0.18</td>
<td>0.425</td>
</tr>
<tr>
<td>Haemoglobin, gr/dl</td>
<td>12.27±1.0</td>
<td>12.35±1.07</td>
<td>0.09±0.46</td>
<td>0.72</td>
</tr>
<tr>
<td>Haematocrit, %</td>
<td>36.21±7.76</td>
<td>37.15±3.13</td>
<td>1±3.6</td>
<td>0.391</td>
</tr>
<tr>
<td>Platelet, /mm³</td>
<td>303.7±100.9</td>
<td>255.4±104.8</td>
<td>-48.3±139</td>
<td>0.895</td>
</tr>
<tr>
<td>Neutrophil, %</td>
<td>55.4±10.65</td>
<td>56.6±12.32</td>
<td>1.1±7.93</td>
<td>0.77</td>
</tr>
<tr>
<td>Lymphocyte, %</td>
<td>33.81±10</td>
<td>32.25±10.86</td>
<td>-1.56±6.23</td>
<td>0.453</td>
</tr>
<tr>
<td>Monocyte, %</td>
<td>7.41±1.82</td>
<td>7.38±1.48</td>
<td>-0.02±1.57</td>
<td>0.886</td>
</tr>
<tr>
<td>Eosinophil, %</td>
<td>2.94±1.7</td>
<td>3.22±2.5</td>
<td>0.26±1.15</td>
<td>0.366</td>
</tr>
<tr>
<td>Basophil, %</td>
<td>0.39±0.26</td>
<td>0.5±0.22</td>
<td>0.17±0.16</td>
<td>0.93</td>
</tr>
</tbody>
</table>

*Data were presented as mean ± SD (95%CI); Δ after minus before; *significant (p<0.05)

*The difference after and before fasting (Paired-samples T test or Wilcoxon rank-sum test)
Fasting has been extensively verified as very beneficial for health. It can improve the immune system, prevent cancer and improve memory, mood and quality of life. Fasting could be expected to prevent ageing due to a decreased risk of the incidence of degenerative diseases. The results of this research indicate that Daud fasting done for 22 days by healthy geriatric women can reduce weight, BMI and LDL-C level although statistically the decrease is not different from those who do not fast. Previous research on the elderly also shows a decrease in BMI, although not significantly. In addition, the HDL-C levels decrease significantly after Daud fasting but still within normal limits. This may be due to a change in the dietary composition during fasting. There was no significant changes in LDL/HDL cholesterol ratio after Daud fasting. The LDL/HDL cholesterol ratio of 3 indicate cardiovascular risk, but this ratio after fasting was only 2.4±0.66. Other research shows that there are still variations in the levels of HDL-C and LDL-C after Ramadan fasting, but there is a tendency for fasting to have good effects, i.e. a decrease in the levels of LDL-C and an increase in the levels of HDL-C.

There were no significant differences in haematological parameters except basophil, and this was still within normal limits. Other research by Furuncouloet shows that haemoglobin decreases and is significantly different after Ramadan fasting and lymphocytes increase significantly, but haematocrit, total leukocytes, platelets and granulocytes are not significantly different. In young adult athletes who exercise 2–3 hours a day, fasting does not change the value of the normal white blood cell count (WBC), lymphocytes and neutrophil. Instead, it increases the value of C4 and immunoglobulin A, meaning that fasting can actually be protective because it improves the immune system.

CONCLUSION

There were no differences to the routine blood parameters, renal function, urine ketones and Low Density Lipoprotein Cholesterol (LDL-C). Daud fasting is safe to be performed by healthy post-menopausal women, but the composition of the meal and break should include adequate macronutrients and micronutrients, because there is a tendency to malnutrition in the elderly.

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REFERENCES

16. Cheah SH, Ch’Ng SL, Husain R, Duncan MT. Effects