

## CHAPTER IV

### RESULTS

#### 1. Hypercholesterolemic subjects

Thirty-four subjects were enrolled in this study. Four subjects dropped out from the study: 1 subject underwent operation, 2 subjects became pregnant and 1 subject discontinued. Therefore, 30 subjects (2 males and 28 females) completed the study and the characteristics of the subjects enrolled in the study are shown in Table 7. The average age, weight and height were  $42.23 \pm 6.25$  years,  $57.18 \pm 8.58$  kg and  $156.53 \pm 5.34$  cm, respectively. The mean value of weight and BMI of the subjects at baseline, week 6 and week 12 did not change throughout the study (Table 8).

#### 2. Dietary assessment questionnaires

Scores of dietary assessment questionnaires modified from ATP III at baseline, week 6 and week 12 are presented in Table 9. Dietary assessment scores significantly decreased after nutrition counseling alone and nutrition counseling with *O. canum* seed supplementation, compared with baseline. There was no significant difference between week 6 and week 12.

**Table 7** Characteristics of the subjects

Parameters	Value (mean $\pm$ SD)
Age (years)	42.23 $\pm$ 6.25
Weight (kg)	57.18 $\pm$ 8.58
Height (cm)	156.53 $\pm$ 5.34
BMI (kg/m <sup>2</sup> )	23.36 $\pm$ 3.54

**Table 8** Weight and BMI of subjects at week 0, 6 and 12

Parameters	Week 0	Week 6	Week 12
Weight (kg)			
Mean $\pm$ SD	57.18 $\pm$ 8.58	56.77 $\pm$ 8.25	56.64 $\pm$ 8.23
BMI (kg/m <sup>2</sup> )			
Mean $\pm$ SD	23.36 $\pm$ 3.54	23.18 $\pm$ 3.36	23.16 $\pm$ 3.35

**Table 9** Scores of dietary assessment questionnaires

Parameters	Week 0	Week 6	Week 12
Scores (points)			
Mean $\pm$ SD	57.97 $\pm$ 23.49 <sup>a</sup>	30.57 $\pm$ 20.29 <sup>b</sup>	30.03 $\pm$ 16.77 <sup>b</sup>

On the same row, different letters mean the significant difference at  $p < 0.05$

### 3. Dietary nutrient intakes

The average dietary nutrient intakes are presented in Table 10. At baseline, total energy intake was  $1739.45 \pm 421.07$  kcal/day, and significantly decreased to  $1512.35 \pm 273.67$  and  $1484.14 \pm 326.38$  kcal/day at week 6 and week 12 respectively. Total energy intakes at week 6, and 12 were not significantly different. After nutrition counseling and nutrition counseling with *O. canum* seed supplementation, there were no significant differences in percentage of total calories from carbohydrate, protein and fat. After nutrition counseling with *O. canum* seed supplementation, the amount of carbohydrate and protein intakes were significantly decreased. Dietary fat intakes at week 6 and 12 were significantly less than that at baseline but they were not significantly different between each other.

Average dietary fat intake, including polyunsaturated fatty acids (PUFAs), monounsaturated fatty acids (MUFAs) and saturated fatty acids (SFAs) are shown in Table 10. PUFA intake decreased after nutrition counseling and 6-week of nutrition counseling with *O. canum* seed supplementation with no statistically difference. The amounts of MUFA intake (g/day) were significantly decreased. However, there was no significant difference of MUFA intake between week 6 and week 12 and the percentage of calories from MUFAs did not change throughout the study. At week 6 and 12, the total calories and amount of SFAs were significantly decreased when compared with baseline but there was no significant difference between week 6, and 12.

After 6-week of nutrition counseling period, mean dietary cholesterol intake was less than that at baseline and further reduced reaching significance after 6-week of nutrition counseling with *O. canum* seed supplementation. For dietary fiber intake,

there were no statistically differences throughout the study but it seemed to be decreased from baseline.

#### **4. Serum lipid levels**

Serum total cholesterol, triglyceride, LDL cholesterol and HDL cholesterol at week 0, 6 and 12 are presented in Table 11. There was no significant difference in serum levels of total cholesterol, triglycerides, LDL cholesterol, and HDL cholesterol at every time point. However, there were trends of decreases in total cholesterol and LDL cholesterol concentrations after the both experimental periods.

#### **5. Compliance and adverse effects during *O. canum* seed supplementation**

The average percentage of compliance was  $79.33 \pm 13.24$ . Mild adverse effects including abdominal discomfort, flatulence and constipation were found in 3 subjects.

**Table 10** Average dietary nutrient intakes at week 0, 6, and 12\*

Nutrients	Week 0	Week 6	Week 12
Energy intake (Kcal/day)	1739.45 ± 421.07 <sup>a</sup>	1512.35 ± 273.67 <sup>b</sup>	1484.14 ± 326.38 <sup>b</sup>
Carbohydrate g/day	230.88 ± 65.19 <sup>a</sup>	208.45 ± 45.17 <sup>a</sup>	202.12 ± 55.2 <sup>b</sup>
% of total calories	52.00 ± 7.42 <sup>a</sup>	55.10 ± 6.63 <sup>a</sup>	54.40 ± 6.93 <sup>a</sup>
Protein g/day	60.78 ± 18.62 <sup>a</sup>	53.87 ± 16.39 <sup>a</sup>	50.08 ± 12.48 <sup>b</sup>
% of total calories	14.30 ± 2.64 <sup>a</sup>	14.23 ± 2.66 <sup>a</sup>	13.70 ± 2.97 <sup>a</sup>
Fat g/day	67.09 ± 19.91 <sup>a</sup>	52.87 ± 12.50 <sup>b</sup>	54.29 ± 15.11 <sup>b</sup>
% of total calories	33.77 ± 6.94 <sup>a</sup>	30.70 ± 5.39 <sup>a</sup>	31.97 ± 6.59 <sup>a</sup>
PUFAs g/day	22.16 ± 10.81 <sup>a</sup>	19.19 ± 11.55 <sup>a</sup>	16.74 ± 6.95 <sup>a</sup>
% of total calories	11.15 ± 3.77 <sup>a</sup>	11.14 ± 4.98 <sup>a</sup>	9.86 ± 3.03 <sup>a</sup>
MUFAs g/day	15.88 ± 6.26 <sup>a</sup>	11.84 ± 3.73 <sup>b</sup>	10.97 ± 3.44 <sup>b</sup>
% of total calories	7.99 ± 2.18 <sup>a</sup>	6.88 ± 1.61 <sup>a</sup>	6.46 ± 1.50 <sup>a</sup>
SFAs g/day	13.85 ± 7.15 <sup>a</sup>	8.23 ± 2.81 <sup>b</sup>	7.43 ± 2.46 <sup>b</sup>
% of total calories	6.97 ± 2.49 <sup>a</sup>	4.78 ± 1.21 <sup>b</sup>	4.38 ± 1.07 <sup>b</sup>
Dietary cholesterol mg/day	235.41 ± 89.09 <sup>a</sup>	190.46 ± 100.55 <sup>a</sup>	153.14 ± 97.12 <sup>b</sup>
Dietary fiber g/day	7.35 ± 3.48 <sup>a</sup>	5.73 ± 2.35 <sup>a</sup>	5.91 ± 3.79 <sup>a</sup>

\* Values are expressed as mean ± SD

On the same row, different letters mean the significant difference at  $p < 0.05$

**Table 11** Serum total cholesterol, triglyceride, LDL cholesterol and HDL cholesterol at week 0, 6, and 12\*

Parameters	Week 0	Week 6	Week 12
Total cholesterol (mg/dl)	249 ± 28 <sup>a</sup>	241 ± 28 <sup>a</sup>	236 ± 28 <sup>a</sup>
Triglyceride (mg/dl)	106 ± 59 <sup>a</sup>	108 ± 51 <sup>a</sup>	107 ± 63 <sup>a</sup>
LDL cholesterol (mg/dl)	164 ± 31 <sup>a</sup>	159 ± 27 <sup>a</sup>	154 ± 22 <sup>a</sup>
HDL cholesterol (mg/dl)	64 ± 16 <sup>a</sup>	61 ± 12 <sup>a</sup>	61 ± 10 <sup>a</sup>

\* Values are expressed as mean ± SD

On the same row, different letters mean the significant difference at  $p < 0.05$