Dietary Fatty Acids and Lipid Profiles in a Cohort of Young Adults

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Dietary Fats

● One of three key macronutrients
  ○ Energy production/storage
  ○ Insulation
  ○ Messengers

● Dietary fats in form of fatty acids¹
  ○ Saturated FA - animal source
  ○ Monounsaturated FA - plant source
  ○ Polyunsaturated FA – essential

Effects of Overconsumption of Dietary Fat

- Overconsumption or improper intake → energy imbalance
- Increased risk of obesity and related diseases
  - Dyslipidemia
  - Central adiposity
  - Atherosclerosis
- Not all fats are the same
  - Saturated fats = increased risk of dyslipidemia
Lipids

- Triglycerides

- Total Cholesterol
  - High Density Lipoprotein (HDL)
  - Low Density Lipoprotein (LDL)
Research in Younger Populations

- Lasting impact into late adulthood²
- Research needs to happen before diagnosis!
- Prevention of diseases via healthier lifestyle essential

Objective

- To determine associations between dietary fat intake and lipid composition
  - cholesterol and lipoprotein levels

- Hypothesis: SFA intake is associated with elevated levels of TC and LDL while MUFA and PUFA intake is associated with higher HDL level
Methods

- Cross-sectional study
- Fasting blood sample and food-frequency questionnaire.
- Fat intake was expressed as a % of total calories.
- Regression analysis used to determine associations between different types of FA and lipid cholesterol levels.
<table>
<thead>
<tr>
<th></th>
<th>Whole Sample</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean ± SD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>25.6 ± 5.1</td>
<td>26.0 ± 5.1</td>
<td>24.5 ± 4.9</td>
</tr>
<tr>
<td>BMI</td>
<td>26.6 ± 4.4</td>
<td>25.8 ± 4.49</td>
<td>27.2 ± 4.23</td>
</tr>
<tr>
<td>TC</td>
<td>148.6 ± 26.1</td>
<td>138.9 ± 25.0</td>
<td>157.8 ± 24.9</td>
</tr>
<tr>
<td>TG</td>
<td>74.9 ± 30.1</td>
<td>73 ± 28.5</td>
<td>71.8 ± 20.2</td>
</tr>
<tr>
<td>HDL</td>
<td>56.4 ± 15.5</td>
<td>48.7 ± 10.0</td>
<td>65.1 ± 15.6</td>
</tr>
<tr>
<td>LDL</td>
<td>80.0 ± 18.4</td>
<td>80.6 ± 17.7</td>
<td>79.1 ± 20.2</td>
</tr>
</tbody>
</table>

BMI = body mass index; TC = total cholesterol; TG = triglyceride; HDL = high density lipoprotein; LDL = low density lipoprotein. Lipids measured in mg/dl.
Comparison of Dietary Fatty Acid Intake by Sex

Intake Expressed as % Total calories

<table>
<thead>
<tr>
<th>Fatty Acid Type</th>
<th>Total Fat</th>
<th>Sat Fat</th>
<th>MUFA</th>
<th>PUFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>female</td>
<td>30</td>
<td>10</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>male</td>
<td>35</td>
<td>15</td>
<td>10</td>
<td>3</td>
</tr>
</tbody>
</table>

- female
- male
Results

- SFA intake significantly associated with TC (P=0.02, $\beta=2.19$), and LDL (P=0.04, $\beta=1.57$).
- PUFA intake significantly associated with higher HDL levels (P=0.03, $\beta=0.07$).
- MUFA intake **not** associated with any outcomes.
Conclusion

- SFA intake significantly associated with increased TC and LDL
  - Reduced intake of foods high in SFA
- Increased intake of PUFA will elevate HDL levels.
- Females significantly lower TC and HDL levels, compared to males.
  - physical activity
  - age
  - Ethnicity
  - genetics.
- More research is needed in this age range
Acknowledgments

Bridget Hannon

Margarita Teran-Garcia, MD, PhD, FTOS

Katie Robinson