Value of Computed Tomography-Defined Visceral Fat Area as a Risk Factor for Endometrial Cancer

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Endometrial cancer has been in upward tendency in KOREA.
Background

- Obesity is a well-established risk factor for endometrial cancer.
- The current hypothesis in obesity-related cancer research is that visceral obesity increases cancer risk via its adverse impact on inflammation and metabolism.

Background

BMI is a simple, inexpensive, and noninvasive surrogate measure of body fat.

But, BMI is an imperfect measurement of body fat distribution.
• Larger number of inflammatory and immune cells

• Lesser cellular, vascular, innervated
Aim

• We investigated the relation between visceral fat accumulation as measured by computed tomography (CT) and the occurrence of endometrial cancer.
Methods

• From 2010.1.1. to 2014.12.31
• Case-control study
  – Histologically confirmed endometrial cancer cases (n=52)
  – Age, BMI matched normal control cases (n=52) from health checkup people
Methods

Patients from our institution with the diagnosis of endometrial cancer
N=124

Excluded due to:
- Recurrent diseases (n=12)
- No abdominal CT available (n=39)
- Transfer out (n=7)

Patients who underwent primary surgery in our institution
N=66

Excluded due to:
- Incomplete information (n=14)

Induced in the present study
N=52
Methods
Statistics

- Propensity Score Matching method was performed by using R program (Matching packages) and **Age** and **BMI** was used to estimate the propensity score.
- Quantitative variables were compared using the Mann-Whitney test, but results are presented as mean±SD.
- Spearman Correlation Analysis was used to identify the relationship between BMI and 3 measurements (VF, SF, and TF)
Demographics

<table>
<thead>
<tr>
<th></th>
<th>Endometrial cancer cases (n = 52)</th>
<th>Control (Before matched, n = 854)</th>
<th>Control (After matched, n = 52)</th>
<th>$P^*$ (Case vs. matched control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>55.7 ± 1.7</td>
<td>55.2 ± 9.3</td>
<td>52.7 ± 1.1</td>
<td>0.147</td>
</tr>
<tr>
<td>BMI</td>
<td>24.4 ± 0.6</td>
<td>23.3 ± 3.4</td>
<td>23.6 ± 0.4</td>
<td>0.218</td>
</tr>
<tr>
<td>VF area (cm$^2$)</td>
<td>76.2 ± 25.0</td>
<td>.</td>
<td>62.2 ± 13.9</td>
<td>0.007</td>
</tr>
<tr>
<td>SF area (cm$^2$)</td>
<td>194.2 ± 86.5</td>
<td>.</td>
<td>176.7 ± 45.8</td>
<td>0.315</td>
</tr>
<tr>
<td>TF area (cm$^2$)</td>
<td>270.3 ± 99.9</td>
<td>.</td>
<td>238.9 ± 53.8</td>
<td>0.137</td>
</tr>
<tr>
<td>V/S ratio</td>
<td>0.55 ± 0.61</td>
<td>.</td>
<td>0.37 ± 0.09</td>
<td>0.086</td>
</tr>
</tbody>
</table>

Data are mean ± SD.

*<0.05, Mann-Whitney test.
Results

BMI-VF
$R^2 = 0.299$
$R = 0.326^{**}$

BMI-SF
$R^2 = 0.528$
$R = 0.549^{**}$

BMI-TF
$R^2 = 0.584$
$R = 0.551^{**}$

** $P < 0.001$
Results

- **VF**: AUC = 0.654, Cutoff = 70.8
- **TF**: AUC = 0.585, Cutoff = 268.55
- **RATIO**: AUC = 0.594, Cutoff = 0.45
- **SF**: AUC = 0.557, Cutoff = 216.5

![ROC Curve](image)
Conclusions

• The results of our study show an association between visceral fat, as measured by CT, and endometrial cancer risk.

• The results revealed lower correlations for BMI with VF than for SF or TF.
  – VF has more potential to represent than BMI for endometrial cancer risk.