Objective
There is a paucity of information regarding the evaluation of ovarian mass scoring systems with ultrasound in pregnancy. The aim of this study was to compare ultrasonographic ovarian mass scoring systems in pregnant women.

Method
- Multicenter retrospective study in 11 referral hospitals.
- From August 2010 to December 2017
- Included pregnant women
  - Evaluated for ovarian mass with ultrasound
  - Underwent for surgery during pregnancy or within 3 months after delivery
- Review of the ultrasound images of ovarian masses at the time of ultrasound diagnosis
- Ovarian masses were scored using three different scoring systems
  - IOTA ADNEX, Sassone, and Lerner
- The patients were classified into two groups
  - Benign or malignant (pathologic diagnosis)
- Receiver operating characteristic (ROC) curves were generated for each scoring systems.

Result
- Total 236 pregnant women
  - Benign: 223 women (94.5%)
  - Malignancy: 13 women (5.5%)
  - The 6 findings were different between benign and malignant mass
    - Maximal diameter of mass, maximal diameter of solid mass, wall thickness of mass, inner wall structure, and papillarity
  - In all of three scoring systems, the ovarian mass scores in malignant mass were significantly higher than those in benign mass, with the highest area under ROC curve (AUROC) in Sassone score.
  - The combined model was developed with 6 different ultrasound findings, and the AUROC of combined model was 0.883 (p-NS between combined model and Sassone).

Table. Diagnostic indices of ovarian mass scores to predict malignancy in pregnancy women

<table>
<thead>
<tr>
<th>Variables</th>
<th>Area (±SE) under ROC curve</th>
<th>p-value</th>
<th>95% CI</th>
<th>Cut-off value</th>
<th>Sensitivity% (95% CI)</th>
<th>Specificity% (95% CI)</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sassone score</td>
<td>0.831 ± 0.051</td>
<td>&lt;0.001</td>
<td>0.777 – 0.876</td>
<td>&gt;7</td>
<td>69.23 (38.6-90.9)</td>
<td>84.75 (79.4-89.2)</td>
<td>20.9</td>
<td>97.9</td>
</tr>
<tr>
<td>Lerner score</td>
<td>0.710 ± 0.081</td>
<td>0.010</td>
<td>0.648 – 0.767</td>
<td>&gt;1</td>
<td>76.92 (46.2-95.0)</td>
<td>68.61 (62.1-74.6)</td>
<td>12.5</td>
<td>98.1</td>
</tr>
<tr>
<td>IOTA ADNEX</td>
<td>0.709 ± 0.093</td>
<td>0.025</td>
<td>0.646 – 0.766</td>
<td>&gt;14</td>
<td>61.54 (31.6-86.1)</td>
<td>84.75 (79.4-89.2)</td>
<td>19.0</td>
<td>97.4</td>
</tr>
<tr>
<td>Combined model*</td>
<td>0.883 ± 0.048</td>
<td>&lt;0.001</td>
<td>0.834 – 0.921</td>
<td>&gt;0.22</td>
<td>69.23 (38.6-90.9)</td>
<td>94.62 (90.8-97.2)</td>
<td>42.9</td>
<td>98.1</td>
</tr>
</tbody>
</table>

SE: standard error; ROC: receiver operating characteristic; CI: confidence interval; PPV: positive predictive value; NPV: negative predictive value; *: 6 factor: Maximal diameter of ovarian mass, maximal diameter of ovarian solid mass, wall thickness, septation and papillarity; †: Youden index was used for analysis; ‡: Values are given as % (95% CI); ‡: P < 0.05 compared with Sassone score by the method of DeLong et al.; ‡: P < 0.01 compared to Sassone score by McNemar’s test.

Conclusion
In pregnant women, the malignant ovarian tumor can be predicted with high accuracy by either Sassone score or the combined model.