Evaluating of pelvic floor muscle functions using two-dimensional transperineal ultrasound in pelvic organ prolapse

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Introduction

Ultrasoundography has developed to become an alternative method and a more practical alternative for both anatomical and functional assessment. Measurement of the descent of the anterior-posterior diameter (APD) of levator hiatus on ultrasound during voluntary contraction of PFM can be used to assess both the supporting function and the contractile function of the pelvic floor.

Nevertheless, to date, a few reports were published the validity of APD for the patients with pelvic organ prolapse (POP).

The aim of this study is to compare the pelvic function between women with pelvic organ prolapse pre and post PFM training, using conventional perineometry and dynamic transperineal ultrasound.

Methods

Twenty-eight women with POP were enrolled (67 years old (49-76)). Patients participated supervised PFM training (PFMT) for 16 weeks.

The maximum voluntary contraction (MVC) of PFM was assessed by perineometry (Peritron®). The formula used to calculate the difference in terms of distance between the maximum contraction and rest was as follows: APD = (APD at rest – APD at contraction). The reliability tests for vaginal pressure and ΔAPD was conducted in the first and second physiotherapy session.

Statistical analyses

Paired-T test or Wilcoxon signed-rank test for the pelvic functions before and after 16-week PFMT/ Spearman’s rank correlation coefficient for MVC and APD/ The reliability was tested by intraclass correlation coefficients P values <0.05 considered significant. (Yoshida M et al. 2012)

Results

<table>
<thead>
<tr>
<th></th>
<th>DAY 1</th>
<th>DAY 2</th>
<th>ICC</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APD at rest (mm)</td>
<td>59.3 ± 4.7</td>
<td>58.6 ± 5.1</td>
<td>0.89</td>
<td>(0.39 – 0.99)</td>
</tr>
<tr>
<td>APD during PFM contraction (mm)</td>
<td>47.9 ± 3.2</td>
<td>49.3 ± 2.8</td>
<td>0.88</td>
<td>(0.37 – 0.99)</td>
</tr>
<tr>
<td>MVC (cmH2O)</td>
<td>20.8 ± 10.6</td>
<td>21.6 ± 9.3</td>
<td>0.97</td>
<td>(0.80 – 0.99)</td>
</tr>
</tbody>
</table>

Reliability indexes of each PFM function (n=5)

<table>
<thead>
<tr>
<th>Before PFMT</th>
<th>After PFMT</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APD (mm)</td>
<td>8.9±5.1</td>
<td>12.1±4.4</td>
</tr>
<tr>
<td>MVC (cmH2O)</td>
<td>24.0±13.9</td>
<td>31.2±14.5</td>
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</tbody>
</table>

The changes of PFM functions between before and after PFMT (Paired-T test or Wilcoxon signed-rank test : p<0.05 n=28)

Conclusions

Patients with POP

Depressed PFM functions

Levator hiatus area

PFM function was independently associated with POP.  
(Braekken IH et al. 2009)

In POP patients, the levator hiatus area enlarged, and larger with progressive prolapse.  
(Delancey JO et al. 1998)

After Supervised PFMT for 16 weeks

Improved

MVC

PFM strength

APD

Correlation between MVC & APD

Our results supported the feasibility of APD by ultrasonography to assess PFM contractility in patients with POP

References


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