Introduction

This study was performed to determine FHR changes and neonatal outcomes that occur in fetuses whose mothers have vaginal bleeding due to adherent placenta previa.

Methods

NST data acquired from a computerized FHR analysis system at Hanyang University Hospital between 2007 and 2017 was analyzed. A 156 patients with adherent placenta previa were enrolled and was compared to 156 normal pregnancy. All were evaluated at 27-42 weeks’ gestation. Neonatal outcomes and FHR parameters were compared and analyzed. Also the approximate entropy (ApEn) was calculated to quantify irregularity and the chaotic dynamics of each FHR time series.

Results

The FHR parameters were significantly different between the groups(Table 1). The change of ApEn differed according to the late gestational age between two groups(Figure 1).

Table 1. Comparisons of FHR parameters

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (N=156)</th>
<th>27-31 w (n=156)</th>
<th>32-37 w (n=94)</th>
<th>38-42 w (n=39)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHR(bpm)*</td>
<td>144.42±8.36</td>
<td>147.70±4.92</td>
<td>144.43±8.18</td>
<td>141.28±9.53</td>
<td>0.0085</td>
</tr>
<tr>
<td>FM*</td>
<td>3.28±3.85</td>
<td>4.44±4.65</td>
<td>3.39±3.93</td>
<td>2.33±3.18</td>
<td>0.0996</td>
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<tr>
<td>AMF (bpm)*</td>
<td>16.82±3.51</td>
<td>15.83±3.35</td>
<td>17.23±6.28</td>
<td>16.41±6.18</td>
<td>0.7792</td>
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<tr>
<td>MMR(ms)*</td>
<td>50.88±17.89</td>
<td>46.00±10.14</td>
<td>51.84±19.04</td>
<td>51.44±18.49</td>
<td>0.5826</td>
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<tr>
<td>Acc1010*</td>
<td>4.31±4.54</td>
<td>3.52±3.88</td>
<td>4.48±4.50</td>
<td>4.39±5.05</td>
<td>0.6589</td>
</tr>
<tr>
<td>Acc1515*</td>
<td>2.09±3.05</td>
<td>1.39±2.74</td>
<td>2.19±3.27</td>
<td>2.26±2.64</td>
<td>0.3936</td>
</tr>
<tr>
<td>Dec1010*</td>
<td>2.16±3.12</td>
<td>1.91±2.15</td>
<td>2.54±3.60</td>
<td>1.39±2.10</td>
<td>0.3466</td>
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<tr>
<td>Dec1515*</td>
<td>0.40±1.46</td>
<td>0.17±0.39</td>
<td>0.54±1.78</td>
<td>0.21±0.83</td>
<td>0.5525</td>
</tr>
</tbody>
</table>

Values are given as mean ± SD
Comparisons with significant level(p<0.05) between groups are indicated by *.

Conclusion

The FHR parameters were significantly higher in low implanted placenta group. Increased FHR parameters might reflect accelerated fetal maturation due to fetal stress in placenta previa mother with bleeding.

Furthermore, the lower value of ApEn was seen in accordance with late gestational age in low implanted placenta group.

Nonlinear indices such as ApEn can be helpful to predict worse outcomes in placenta previa mother with bleeding especially in late gestational age.