Comparative clinical studies of fertility and infertility in women with endometriosis

Porównawcza analiza cech klinicznych występujących u płodnych i niepłodnych kobiet chorych na endometriozę

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Abstract

Objective: To compare clinical characteristics of infertile and fertile patients with endometriosis.

Material and methods: We evaluated medical records of women who underwent surgical treatment of endometriosis (n=284) between January 1999 and December 2003. Our study included only cases of histopathologically proven pelvic endometriosis (n=269). These patients were categorized into two groups named after infertile (n=45) and fertile cases (n=224). Clinical data were compared.

Results: Infertile patients are younger (t student. P=0.0000), have lower weight (Wilcoxon test P=0.0150), lower blood pressure — either systolic (Wilcoxon test P=0.0006) or diastolic (Wilcoxon test P=0.0007), separate noncystic endometriotic lesions occur frequently among these cases (Pearson chi-square P=0.000).

Conclusion: Noncystic endometriotic implants are more strongly related to infertility than endometriomas. The relationship between blood pressure and infertility requires further investigation.

Key words: endometriosis / infertility / endometrioma /
Introduction

Endometriosis is a pathologic condition commonly found in women of reproductive age. It was first described in 1860 by von Rokitansky [1] and since then has been defined as the presence of tissue resembling functioning endometrial glands and stroma outside the uterine cavity. A number of theories attempt to explain the etiology of endometriosis. Current theories regarding histogenesis include the transplantation of exfoliated endometrium [2, 3], coelomic metaplasia [4], and embryonic mulerian rests [5,6,7]. Despite over 130 years of endometriosis investigation, the disease remains enigmatic.

In numerous retrospective clinical studies, the revised classification of endometriosis proposed by The American Fertility Society (AFS) has been used. This system is based on a 40-point scale and includes four stages [8]. Minimal (stage I) and mild (stage II) disease are both characterized by scattered, superficial noncystic implants on structures with no associated adhesions. Moderate (stage III) disease is characterized by multiple implants or small endometriomas (<2cm) and/or minimal peritubal or periovarian adhesions. Severe (stage IV) disease is characterized by large ovarian endometriomas, significant tubal or ovarian adhesions, tubal obstruction, obliteration of cul de sac and major uterosacral involvement [9]. While classification strategies appear to correlate strongly with pelvic pain, the correlation between stage of disease and infertility is weak [10]. As pointed out recently by Schenken and Guzick, new measures or characteristics of the disease beyond those currently used are sorely needed [10].

The data on operative findings and the results of histopathological examination were reviewed. These patients were diagnosed between January 1999 and December 2003 by direct visualization at laparoscopy (n=65), laparotomy (n=204) and wide resection of abdominal wall tumors (n=15). Histopathology examination was performed on all excised specimens.

We included in our study only cases with pelvic endometriosis (n=269) excluding women with scar endometriosis for lack of information about their abdominal organs.

Results

All patients in this study were Polish women living in Gdańsk. Of a total of 269 women with histopathologically proven pelvic endometriosis, infertility was recognized in 45 cases (16.7%). The mean age in this group was 29.9 (SD - 4.3 years), mean number of births was 0.43 SD - 0.9, mean weight was 59.0 SD - 9.3kg, mean height was 166.7 SD - 4.7cm, mean...
Age at the menarche was 13.4 SD - 1.1 years, mean length of menstrual cycle was 24.8 SD - 10.0 days, mean duration of menstrual flow was 5.3 SD - 2.4 days, mean value of systolic blood pressure was 114.7 SD - 9.4 mmHg, mean value of diastolic blood pressure was 73.4 SD - 8.8 mmHg. In this group, we noted 23 cases with separate noncystic endometriotic implants (51.11%), 10 cases with noncystic endometriotic implants coexisting with endometriomas (22.22%) and 12 cases with separate endometriomas (26.67%).

Among infertile women with endometriosis, noncystic endometriotic implants were found more frequently (n=23, 51.11%) than endometriomas (n=12, 26.67%) (p<0.001, odds ratio 3.7, 95% confidence interval 1.4, 9.9).

In the remaining 224 fertile cases (83.3%) the indications for surgery were: pelvic pain syndrome (n=13), pelvic pain caused by persistent ovarian cysts (n=128) and non-symptomatic endometriomas found during gynecological/USG examination (n=83).

The mean age in this group was 36.8 SD - 8.5 years, mean number of births was 1.5 SD - 1.4, mean weight was 63.4 SD - 12.7 kg, mean height was 165.0 SD - 5.9 cm, mean age at the menarche was 13.3 SD - 1.4 years, mean length of menstrual cycle was 25.5 SD - 7.8 days, mean duration of menstrual flow was 5.2 SD - 2.1 days, mean value of systolic blood pressure was 122.6 SD - 15.6 mmHg, mean value of diastolic blood pressure was 79.5 SD - 11.1 mmHg. In this group we noted 13 cases with separate noncystic endometriotic implants (5.8%), 49 cases with noncystic endometriotic implants coexisting with endometriomas (21.88%) and 162 cases with separate endometriomas (72.32%). Among fertile women with endometriosis, endometriomas were found more frequently (n=162, 72.32%) than noncystic endometriotic implants (n=13, 5.8%) (p<0.000, odds ratio 155.3, 95% confidence interval 69.8, 345.2). The data distribution compared among fertile (n=224) and infertile (n=45) women with pelvic endometriosis is summarized in table 1.

It shows that infertile patients are younger (t-student. P=0.0000), have lower weight, lower blood pressure – either systolic (Wilcoxon test P=0.0006) or diastolic (Wilcoxon test P=0.0007), noncystic endometriotic implants occur frequently among infertile women with endometriosis as opposed to endometriomas (Pearson chi-square P=0.0000).

Discussion

In our research only 16.7% women with histopathologically proven pelvic endometriosis were infertile although others studies have observed infertility in 25% to 39% of endometriosis cases [15, 16]. This difference could be explained by the fact that we have included in the infertile group only those women who had primary or secondary infertility for at least 24 months.

The present study has demonstrated that infertile patients are younger (t-student. P=0.0000) than those with fertile endometriosis. No differences in mean age between the 41 fertile and 27 infertile endometriosis patients have been observed by H. Hassa et al [15], but a previous Polish study involving 384 women with endometriosis (170 infertile, 214 fertile) confirms our observations [17].

<table>
<thead>
<tr>
<th>Feature</th>
<th>Infertile N=45</th>
<th>Fertile N=224</th>
<th>Method</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mean age at the time of surgery</td>
<td>29.91</td>
<td>36.83</td>
<td>test Wilcoxon</td>
<td>0.0000</td>
</tr>
<tr>
<td>(years)</td>
<td>59.044</td>
<td>63.431</td>
<td>test Wilcoxon</td>
<td>0.015</td>
</tr>
<tr>
<td>Mean weight (kg)</td>
<td>166.689</td>
<td>164.960</td>
<td>test Wilcoxon</td>
<td>not significant</td>
</tr>
<tr>
<td>Mean height (cm)</td>
<td>13.378</td>
<td>13.272</td>
<td>Test t Studenta</td>
<td>not significant</td>
</tr>
<tr>
<td>Mean age at the menarche (years)</td>
<td>24.822</td>
<td>25.491</td>
<td>Test t Studenta</td>
<td>not significant</td>
</tr>
<tr>
<td>Mean length of menstrual cycle</td>
<td>5.267</td>
<td>5.183</td>
<td>Test t Studenta</td>
<td>not significant</td>
</tr>
<tr>
<td>Mean duration of menstrual flow (days)</td>
<td>114.667</td>
<td>122.545</td>
<td>test Wilcoxon</td>
<td>0.0006</td>
</tr>
<tr>
<td>Mean value of systolic blood pressure (mmHg)</td>
<td>73.444</td>
<td>79.509</td>
<td>test Wilcoxon</td>
<td>0.0007</td>
</tr>
<tr>
<td>Separate endometriomas</td>
<td>26.67(%)</td>
<td>94.20(%)</td>
<td>Test Pearson chi$^2$</td>
<td>0.0000</td>
</tr>
<tr>
<td>Noncystic endometriotic lesions</td>
<td>51.11(%)</td>
<td>5.8(%)</td>
<td>Test Pearson chi$^2$</td>
<td>0.0000</td>
</tr>
<tr>
<td>Endometriomas plus noncystic</td>
<td>22.00(%)</td>
<td>21.88(%)</td>
<td>Test Pearson chi$^2$</td>
<td>not significant</td>
</tr>
</tbody>
</table>
Our results showing that infertile endometriosis patients have lower blood pressure than older and heavier fertile cases could be explained by the fact that blood pressure rises with age and weight [18, 19]. The fact that endometriomas are found more frequently in older women is not a surprise, either. The incidence of endometriomata, like other ovarian tumors, increases with age. Surgical treatment is necessary even in non-symptomatic cysts because malignant transformation has been widely reported in literature [20, 21, 22].

The observation that older fertile patients with endometriomas had never been treated for infertility before belies the previous thesis that endometriomas are the later sequela of the disease, simply a manifestation of more advanced endometriosis. It shows instead that endometriosis is a clinically heterogeneous entity with differing subtypes strongly related to the morphological appearance of the disease. Nisolle M, and Donnez J [13] suggested that peritoneal, ovarian lesions, and nodules of the rectovaginal septum must be considered as different entities with different pathogeneses. They support this thesis with results of immunohistochemical analysis showing the differences in proliferative activity and steroid receptor expression in peritoneal and ovarian endometriosis [12]. Nezath F.R. et al. in the comparative immunohistochemical study of noncystic endometriosis lesions and endometriomas suggest that different genes are involved in the development and maintenance of these two entities [14].

Our study confirms that noncystic endometriotic implants seem to be a clinically different entity than endometriomas. We conclude that noncystic endometriotic implants are more strongly related to infertility than endometriomas. Rare infertile cases with separate endometriomas are older. Their fecundity could be decreased because of age. This question requires further random analysis.

References