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Prevalence and severity of cyclic leg pain in women with endometriosis and in controls – effect of laparoscopic surgery

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ABSTRACT

Objective: In addition to dysmenorrhea, dyspareunia, and subfertility, pain in the lower extremities has been described to be a further complaint in women affected by endometriosis, and lysis of nerve entrapment was thought to be associated with amelioration of leg pain. Therefore, we aimed to compare the prevalence of cyclic leg pain and pain intensity between women with endometriosis and without endometriosis, and to evaluate the effect of laparoscopic surgery.
Study design: Forty-four women with endometriosis and 58 controls were included in a prospective, controlled clinical trial at a University hospital/tertiary referral center. Participants were asked to complete questionnaires the day before and six to nine weeks after laparoscopy. The prevalence and intensity of leg pain and improvement after laparoscopic surgery, quantified according to a visual analog scale (VAS) score, were evaluated. We also recorded involvement of dermatomes, the presence and intensity of dysmenorrhea, and correlations between age, stage of endometriosis (rAFS-score), and preoperative VAS scores.
Results: Before surgery, more women were affected by leg pain in the endometriosis group, compared to the control group (45.5% and 25.9%, respectively). Preoperative VAS scores for leg pain, however, were not significantly different between the two groups. A moderate correlation in the preoperative VAS scores between leg pain and dysmenorrhea was observed. After laparoscopy, we found a significant improvement in leg pain intensity in both groups. The mean difference in the VAS score for pain reduction between the study group and the control group was 0.74 (95% CI: −0.61–2.08), which was not statistically significant.
Conclusions: The prevalence of leg pain is increased in endometriosis, while leg pain intensity is not, compared to women without endometriosis. Laparoscopic surgery—even without preparation and decompression of nerve tissue—is associated with an improvement in pain intensity in women with endometriosis, as well as in the group without endometriosis.

Introduction

Endometriosis, a chronic and recurrent disease characterized by the dystopic location and proliferation of endometrial tissues outside the uterine cavity, is one of the most common gynecological disorders, and affects approximately 6–20% of reproductive-age women [1]. This estrogen-dependent condition is associated with a high degree of morbidity and is one of the leading causes of infertility, dyspareunia, and dysmenorrhea, with the latter being the most frequent complaint reported by women with endometriosis [2]. However, women with symptomatic endometriosis can also experience pain in the lower back and lower extremities [3–6]. Affected women have been reported to be at greater risk of suffering from chronic, cyclic leg pain as a result of endometriosis, which extends to the pelvic wall and causes marked infiltration or compression of the sacral plexus or somatic nerves [7–11]. The feasibility of a laparoscopic transperitoneal approach to the somatic nerves of the pelvis for the diagnosis and treatment of endometriosis-associated pain caused by pudendal and/or sacral nerve root lesions was proposed by Possover et al. [12–14]. Although several surgical techniques for nerve decompression have been described, little is known about the prevalence of leg pain associated with endometriosis. In addition, the potential

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beneficial effect of a laparoscopic exploration and endometriosis resection without lysis of nerve entrapment is uncertain.

Therefore, the aim of the present study was to evaluate the prevalence and intensity of leg pain in women affected by endometriosis, compared to healthy controls, and to explore the potential effect of laparoscopic surgery on postoperative pain scores.

Materials and methods

This prospective data analysis was conducted at the Department of Obstetrics and Gynecology, Medical University of Vienna, from October 2011 to September 2012. Institutional review board approval was obtained for this study, and women gave their verbal and written informed consent prior to inclusion. All procedures were performed in accordance with the ethical standards of the responsible ethics committee.

Women between 18 and 50 years of age, in whom an operative evaluation and treatment for pelvic pain, persistent ovarian cysts, fallopian tube pathology, uterine myoma, or, where a diagnostic work-up for infertility was planned, were requested to complete a questionnaire on the day before surgery. The presence of leg pain was evaluated, and affected women were asked to grade the severity of pain on a 10 cm visual analog scale (VAS), the left extreme of which indicates the absence of pain and the right extreme of which indicates maximum pain [15]. Moreover, women were requested to specify the pain in terms of dermatomes. In addition, the presence and intensity of dysmenorrhea and the general, as well as gynecological medical history, including the use of analgetics, were evaluated. Women were followed-up and asked to fill out the same questionnaire six to nine weeks after the laparoscopic operation and after postoperative allocation of the participants to one of the two groups: endometriosis or non-endometriosis (reference group/control group). At least one menstrual bleeding had to have occurred within the postoperative period. Of note, during surgery, all visible endometriosis lesions were removed, but no preparation or decompression of nerve tissue was performed. The gynecological surgeon who performed the laparoscopy was blinded to the presence of leg pain.

All operations were performed in our tertiary referral center, certified by the SEF (Stiftung Endometriose-Forschung) by a small group of very experienced surgeons. In every laparoscopy, the whole area of operation was carefully evaluated, with attention focused on sites with a predilection for endometriosis.

Every suspected subtle lesion was biopsied for histological verification before complete resection of endometriosis by excision or coagulation. We performed, however, no random biopsies of unsuspicious areas, except in two cases with severe dysmenorrhea. In these two patients, random biopsies of an unsuspicious peritoneum were performed, but endometriosis could not be histologically verified.

Exclusion criteria were as follows: pregnancy; breast-feeding within the last six months; perimenopausal status; any kind of malignancy; and notable orthopedic problems in the spinal area and/or lower extremities.

A total of 111 women were screened, of whom nine had to be excluded. Of these nine patients, one was excluded because of incipient pregnancy (not yet realized by the patient, but detected in the routinely performed preoperative pregnancy test), another patient was excluded because of a history of breast feeding until five months before the operation, two patients were excluded due to oligo-/amenorrhea, and five patients refused the operation immediately before laparoscopy. Thus, 102 eligible women were enrolled and completed this prospective study. In 11 cases, the endometriosis had already been diagnosed in a previously performed laparoscopy.

The objective of the present study was to prove the hypothesis that the presence and intensity of leg pain occurs more often in an endometriosis collective than in non-affected women. In addition, we intended to evaluate the involvement of dermatomes, the presence and intensity of accompanying dysmenorrhea, the potential beneficial effect of laparoscopic surgery on postoperative pain scores, and any correlations between age, stage of endometriosis (rAFS-score), and preoperative VAS scores for leg pain and dysmenorrhea.

Categorical data are presented as counts and percentages and compared between groups using chi-square tests. Continuous data are presented as median and range. Preoperative VAS values were compared between groups using Wilcoxon's rank–sum test for non-normal distributions. Comparisons adjusted for age and BMI were performed using Quade's non-parametric method [16].

Intra-individual VAS differences were compared between groups using ANCOVA models. For unadjusted (crude) comparisons, the respective preoperative VAS was the only co-variable, while, for adjusted comparisons, additional *a priori* selected preoperative variables were used as noted. Group-specific least squares means are provided, with 95% confidence intervals and *p*-values.

Monotone, non-linear associations were quantified using Spearman's correlation coefficient.

The reported *p*-values were the result of two-sided *t*-tests. *p*-values ≤ 0.05 were considered statistically significant. All computations were carried out using SAS software Version 9.3 (SAS Institute Inc., Cary, NC, USA, 2010).

Results

From the 102 included patients, 44 were assigned to the study group, after histological confirmation of the endometriosis; 58 were assigned to the control group.

Patient characteristics are provided in Table 1 [17].

The median time interval between pre- and postoperative completion of the questionnaire was 48.5 days (range, 42–55 days) in the study group, and 47 days (range, 43–64 days) in the control group.

Spearman correlation coefficients were calculated between age, rAFS-score, preoperative VAS score for leg pain, and preoperative VAS score for dysmenorrhea. A moderate correlation between the preoperative VAS score for leg pain and the preoperative VAS score for dysmenorrhea (correlation coefficient: 0.51, $p < 0.001$) was observed. Minor correlations between the rAFS-score and the preoperative VAS score for dysmenorrhea (correlation coefficient: 0.36, $p < 0.001$) and between the rAFS-score and the preoperative VAS score for leg pain (correlation coefficient: 0.25, $p = 0.012$) were also found.

Before laparoscopy, 20/44 (45.5%) women in the study group were affected by leg pain, compared to 15/58 (25.9%) in the control group ($p = 0.039$).

Leg pain was reported to be cyclic and associated with dysmenorrhea in all cases.

Focusing only on the 20 women affected by leg pain and endometriosis, four of them presented with deep infiltrating endometriosis, eight with endometriomas, and 14 with peritoneal endometriosis lesions. In six cases, more than one appearance of endometriosis was observed.

The 24 women with endometriosis, but no leg pain, presented with deep infiltrating endometriosis [3], endometriomas [11], and with peritoneal endometriosis lesions [17]. In seven cases, more than one appearance of endometriosis was observed.

After surgical intervention in 13 women in the study group and in seven women in the control group, the leg pain disappeared. This difference between the two groups was not statistically significant ($p = 0.278$).