Menstrual patterns, pain symptoms, body mass index and smoking habits in women with endometriosis

G. MONTANINO - M. MONTANINO OLIVA - L. GULEMÍ
M. BONINFANTE - E. V. COSMI

Summary: Epidemiologic studies have investigated the risk factors for endometriosis, but currently the results are still controversial. The aim of this study is to evaluate the incidence of some of the risk factors that have been involved with endometriosis to better understand the natural history and evolution of this disease. The medical records of 186 women with laparoscopic diagnosis of endometriosis were studied. We analysed the characteristics of the menstrual cycle, the presence of pain symptoms and the familiarity for endometriosis. Moreover, the body mass index of all patients and the average cigarettes smoked per day were calculated. Despite the fact that some of the data collected resulted to be statistically significant when compared among the four stages of endometriosis, the roles of the many factors that have been associated with the risk or the evolution of pelvic endometriosis still remain unknown.

Key words: Endometriosis; Epidemiologic factors; Pain symptoms; Body mass index; Cigarette smoking.

INTRODUCTION

Endometriosis is the presence of endometrial tissue in ectopic sites. Women in reproductive age are most at risk for endometriosis. The prevalence of the disease is reported to be between 5% and 7% ([1]) with an annual incidence of almost 0.3% (300 new cases diagnosed/100,000 persons in years of risk) ([2]). This discre-

pancy between the high prevalence and the low incidence is probably due to the presumed long duration of endometriosis. In the infertile population, the prevalence of endometriosis has been calculated to be almost 30% ([3]); endometriosis is one of the most common diseases diagnosed in women that have undergone a diagnostic laparoscopy for infertility ([4]). Although various animal studies and clinical trials have been carried out, the etiology and pathogenesis of endometriosis are mainly still unknown. Since 1927, Sampson has advocated that endometriosis may be the result of repeated retrograde flow of endometrial cells through the Fallopian tubes ([5]). Thereby the menstrual characteristics of women with endome-

132

Clin. Exp. Obst. Gyn. - ISSN: 0390-6663
XXII, n. 2, 1995

triosis has been the subject of many investigations.

Epidemiologic studies have investigated the risk factors for endometriosis but the results are most of the time controversial [6]. Factors like body fat distribution and cigarette smoking, that may affect the estrogen levels, have also been associated with endometriosis [7]. The purpose of this study is to evaluate the incidence of some of these factors in women with endometriosis to better understand the natural history of the disease.

MATERIALS AND METHODS

This study has been conducted by the review of the medical records of the women who had had a laparoscopic diagnosis of endometriosis in the period between January 1991 and December 1993, in the II Department of Obstetrics and Gynecology, University of Rome "La Sapienza", Rome, Italy. In every patient, age, height and weight were recorded the day of the surgery. We calculated the body mass index (BMI) by Quetelet's formula {weight/ (height)^2}, considering, according to the most updated data [8-9], a normal BMI between 18.7 and 23.8. Moreover, the characteristics of the menstrual cycle, such as the age at menarche, frequency and days of bleeding and intensity of flow were asked. The patients reported the presence of symptoms like pelvic pain, dysmenorrhea and deep dyspareunia. Furthermore, we investigated the presence of endometriosis in the relatives. In case the woman had been smoking for at least was 5 years, we asked the average cigarettes smoked per day. Statistical analysis was performed using the Student's T test for parametric data, and the chi-square test and Fisher exact test for nonparametric data. Regardless of the test, a P value < 0.05 was considered to be significant.

RESULTS

One hundred and eighty - six patients that after laparoscopy resulted to have endometriosis were scored according to the revised AFS Classification [10]. The frequency of women at Stage I was 20%, 13% at Stage II, 44% at Stage III and 23% at Stage IV.

Table 1. – *Age of the women (mean ± SD).*

Stage I	II	III	IV
29.84±4.73	32.08±4.85	29.85±4.32	29.42±5.16

P=NS

The mean age of the patients was 30.04 (range 20-42), with no significant (NS) difference within the four stages, as described in Table 1. The mean age at menarche was 12.12 (range 10-15), and our data did not show any statistical difference between the different stages.

The menstrual cycle was reported by the women to be regular in 91% of the cases, with an average frequency of 27.8 days. In the patients with a regular menstrual cycle, the flow was described as very mild in 7% of the cases, normal in 59%, whereas 34% of the women reported having a cycle characterized by heavy bleeding.

Among the women with a menstrual cycle < 23 days and > 34 days, a very mild flow was reported by 13%, in 50% the flow was normal and 37% of the women had an irregular menstrual cycle with heavy bleeding. When we asked the patients if they have any pain symptoms, 86% of the women complained about dysmenorrhea or deep dyspareunia or pelvic pain or both of them, whereas 14% of the women were totally painless. In

Table 2. – *Frequency of symptomatic and asymptomatic patients.*

	Symptomatic	Asymptomatic
Stage I (N=38)	68%	32%
Stage II (N=24)	83%	17%
Stage III * (N=82)	90%	10%
Stage IV * (N=42)	95%	5%

(*) P<0.05 versus Stage I.

133

all stages, the frequency of symptomatic women was greater than the women that denied any pain symptoms; the percentage of symptomatic patients increased with the severity of the disease. The difference between symptomatic and asymptomatic women resulted in being significant when we compared the women with minimal endometriosis to the women with moderate or severe endometriosis (Table 2). In our patients dysmenorrhea was the most prevalent symptom (63% of the women) with a slightly greater frequency in Stage IV. Pelvic pain was present in 32% of the patients and deep dyspareunia was reported by 38% of the women (Table 3). After calculating the BMI, 4% of the women resulted to be underweight (BMI < 18.70), 86% had a normal weight and 10% were considered overweight (BMI > 23.80).

The mean BMI in our study group was 20.98 (range 17.26-26.56), resulting in a significantly lower mean BMI in the group of women with mild endometriosis

Table 3. – *Frequency of dysmenorrhea, pelvic pain and deep dyspareunia.*

	Dysmenorrhea	Pelvic-pain	Dyspareunia
Stage I (N=38)	58%	32%	32%
Stage II (N=24)	67%	50%	50%
Stage III (N=82)	61%	41%	27%
Stage IV (N=42)	71%	28%	33%
All patients (N=186)	63%	32%	38%

P=NS

Table 4. – *Body mass index (mean ± SD).*

Stage I	II	III	IV
21.36±1.60	20.01±1.47*	21.08±1.74	21.02±2.06

(*) $P < 0.05$ versus Stages I - III - IV.

Table 5. – *Frequency of smoking and nonsmoking women.*

	Smoking	Nonsmoking
Stage I (N=38)	37%	63%
Stage II (N=24)	50%	50%
Stage III (N=82)	37%	63%
Stage IV (N=42)	67%	33%

P=NS

Table 6. – *Cigarettes smoked per day (mean ±SD).*

Stage I	II	III	IV
15.28±5.01	12.16±4.60	13.60±6.90	11.86±6.21

P=NS

as reported in Table 4. Eighty-four women (45%) had been smoking regularly, for at least 5 years. We did not find any significant difference between the incidence of the stages of the disease when we compared the smoking group to the nonsmoking group (Table 5). In the smoking group the average cigarettes smoked per day was higher in the lower stages of endometriosis, as shown in Table 6. In 11 cases (12%), we found a relative of the patient who had had a previous diagnosis of endometriosis, in these 11 women, 55% of them had a sister with the disease, in 27% the relative was the mother, whereas in 18% an aunt was affected.

DISCUSSION

Epidemiologic studies on endometriosis are not always concordant.

It is well established that endometriosis usually affects women in reproductive, age [11], with an average age at diagnosis between 25 and 29 years [12]. This is in

agreement with our results, where we had a mean age at diagnosis of 30.04 years. According to the retrograde menstruation theory ([5]), menstrual patterns that may favour the retrograde flow of endometrial cells should be associated with an increased risk of developing endometriosis.

Many studies have reported a lower age at menarche in patients with endometriosis than controls ([12, 13, 14]). The mean age at menarche in our patients was 12.12 years, without any significant difference between the four stages. Despite not having a control group in our study, the mean age at menarche of almost 12 years should be considered low when compared to the average age at menarche, that is presently 12.8, in the Caucasian population ([15]). In one study by Candiani et al. ([13]), the Authors suggest that an irregular menstrual cycle significantly reduces the risk of endometriosis. In our experience the patients with irregular menstrual cycles (9%) were mostly associated with the higher stages of endometriosis, and although this was a small series, whether or not menstrual patterns are involved with the risk and the severity of endometriosis is still controversial.

Endometriosis may be characterized by various symptoms; the most common of them are dysmenorrhea, deep dyspareunia and pelvic pain, however many women with endometriosis may be asymptomatic. In agreement with previous studies ([16, 17, 18]), dysmenorrhea was the most prevalent symptom, with a slightly higher frequency in Stage IV. Pelvic pain and dyspareunia, as reported by other Authors ([17]) did not show any prevalence in the various stages. Moreover, Fukuya et al. ([18]) reported, in a retrospective study, that in 40% of the cases the pain symptoms did not reflect the extent of endometriosis. Despite the fact that many Authors ([19, 20]) suggest that there is no relationship between the symptoms, the entity of the disease and the stage, in our study we found that only 5% of the women, that

after laparoscopy were classified as having severe endometriosis, were free of pain. The role of weight and body fat distribution as a risk factor for endometriosis is still debated. It is supposed that overweight women, who tend to have higher estrogen levels, could be more at risk for endometriosis. However, Cramer et al. ([12]) did not find any data supporting a correlation between weight, body fat distribution and endometriosis. Our data show a significantly lower BMI in Stage II, when compared to the other stages; this demonstrates that there is no correlation between the BMI and the evolution of the disease. The role that peripheral estrogen conversion may have in the development of endometriosis requires further investigations.

Smoking has been supposed to protect against endometriosis by affecting the estrogen levels ([12]). However, Parazzini et al. ([21]) in one study did not find any difference in the smoking habits between women with endometriosis and controls. In our population we were not able to demonstrate a difference between the severity of endometriosis and smoking habits, despite the fact that we found a lower number of cigarettes smoked per day in patients with severe endometriosis. Many investigators have reported a familiarity for endometriosis, ranging between 5.8% and 22.4% ([22, 23, 24, 25]). Our percentage (12%) of women with a relative with endometriosis reflect these previous studies. Nowadays, despite genetic studies that have been conducted ([23]), whether or not endometriosis may be characterized as a hereditary disease has not yet been substantiated.

CONCLUSION

Clinical experiences have provided many clues about risk factors for endometriosis. However, it is still difficult to well establish which may be the role of the many factors that have been asso-

ciated with the risk or the evolution of pelvic endometriosis; well-controlled clinical studies would be very helpful in the future.

REFERENCES

1) Cramer D. W.: "Epidemiology of endometriosis". In: Wilson E. A. ed. 'Endometriosis'. New York, N.Y. Alan R. Liss Inc., 1987, 5-22.
2) Houston D. E., Noller K. L., Melton J., Selwyn B. J.: "The epidemiology of pelvic endometriosis". *Clin. Obst. Gyn.*, 1988, *31(4)*, 787.
3) Barbieri R. L.: "Endometriosis 1990, current treatment approaches". *Drugs,* 1990, *39*, 502.
4) Wheeler J. M.: "Epidemiology of endometriosis associated infertility". *J. Reprod. Med.,* 1989, *34(1)*, 41.
5) Sampson J. A.: "Peritoneal endometriosis due to the menstrual dissemination of endometrial tissue into the peritoneal cavity". *Am. J. Obst. Gyn.,* 1927, *14*, 422
6) Vercellini P., Crosignani P. G.: "Epidemiology of endometriosis". In: 'Proceedings of the 3rd World Congress on Endometriosis'. Brussels 1992. Parthenon Publ. Casterton Hall, UK.
7) McCann S. E., Freudenhaim J. L., Darrow S. L., Batt R. E., Zielezny M. A.: "Endometriosis and body fat distribution". *Obst. Gyn.,* 1993, *82(4)*, 545.
8) World Health Organization: "Expert Committee on Community prevention and control of cardiovascular disease". WHO, Geneva, 1984.
9) Royal College of Physician: "Obesity". *J. of Royal College of Physician,* 1983, *17*, 1.
10) American Fertility Society: "Revised American Fertility Society classification of endometroisis". *Fertil. Steril.,* 1985, *43*, 52.
11) Olive D. L., Haney A. F.: "Endometriosis". In: De Cherney A. H. (ed.). 'Reproductive failure'. New York, Churchill Livingstone, 1986, 153-203.
12) Cramer D. W., Wilson E., Stillman R. J., Berger M. J., Melisle S., Schiff L. *et al.*: "The relation of endometriosis to menstrual characteristics, smoking and exercize". *J. Am. Med. Assoc.,* 1986, *255*, 1904.
13) Candiani G. B., Danesino V., Gastaldi A., Parazzini F., Ferraroni M.: "Reproductive and menstrual factors and risk of peritoneal and ovarian endometriosis". *Fertil. Steril.,* 1991, *56*, 230.
14) Darrow S. L., Vena J. E., Batt R. E., Zielezny M. A., Michalek A. M., Selman S.: "Menstrual cycle characteristics and the risk of endometriosis". *Epidemiology,* 1993, *4(2)*, 135.
15) Rees M.: "Menarche when and why?". *Lancet,* 1993, *342,* 1375, Dec. 4.
16) Liu D. T. Y., Hitchcock A.: "Endometriosis: its association with retrograde menstruation, dysmenorrhea and tubal pathology". *Br. J. Obst. Gyn.,* 1993, *93*, 859.
17) Fedele L., Bianchi S., Bocicoolne L., Di Nola G., Parazzini F.: "Pain symptoms associated with endometriosis". *Obst. Gyn.,* 1992, *79(5)*, 767.
18) Fukaya T., Hiroschi H., Yashima A.: "Is pelvic endometriosis always associated with chronic pain?. A retrospective study of 618 cases diagnosed by laparoscopy". *A. J. Obst. Gyn.,* 1993, *169(3)*, 719.
19) Marana R., Muzii L., Caruana P., Dell'Acqua S., Mancuso S.: "Evaluation of the correlation between endometriosis extent, age of the patients and associated symptomatology". *Acta Eur. Fertil.,* 1991, *22(4)*, 209.
20) Rawson J. M. R.: "Prevalence of endometriosis in asvmptomatic women". *J. Reprod. Med.,* 1991, *36(7)*, 513.
21) Parazzini F., La Vecchia C., Franceschi S., Negri E., Cecchetti G.: "Risk factors for endometrioid, mucinous and serous benign ovarian cysts". *Int. J. Epidemiol.,* 1989, *18*, 108.
22) Ranney B.: "Endometriosis. Hereditary tendency". *Obst. Gyn.,* 1971, *37*, 734.
23) Simpson J. L., Elias S., Malinak L. R., Buttram V. C.: "Heritable aspects of endometriosis. Genetic studies". *Am. J. Obst. Gyn.,* 1980, *137*, 332.
24) Lamb K., Hoffmann R. G., Nichols T. R.: "Family trait analysis: a case-control study of 43 women with endometriosis and their best friends". *Am. J. Obst. Gyn.,* 1986, *154*, 596.
25) Moen M. H., Magnus P.: "The family risk of endometriosis". *Acta Obst. Gyn. Scand.,* 1993, *72(7)*, 560.