Is pelvic pain with endometriosis associated with personality? This question has arisen from research showing that the experience of pain with chronic disease involves biological, psychological and social factors, and includes such individual differences as coping strategies and personality traits. No studies that have examined the temperament and character profile of patients with different types of chronic pain have involved women with endometriosis; up to 80% of these patients experience pelvic pain, which may be either short-lived and cyclic, or chronic (lasting ≥6 months).

As part of a larger investigation into the relationship between endometriosis with pelvic pain and several psychological dimensions, Facchin et al from Catholic University of Milan, Italy, investigated the temperament and character profile of 133 nulliparous women aged 20 to 40 years: 51 healthy controls and 82 patients with endometriosis, surgically diagnosed by laparoscopy or laparotomy and histopathologically confirmed. Of those with endometriosis, 58 reported experiencing recurrent or constant pelvic pain within the previous 6 months; 24 reported no pain.

Patients rated the severity of their pain on a 10-point numerical rating scale. Personality was assessed by the 240-item Temperament and Character Inventory Revised (TCI-R), which evaluates 4 dimensions of temperament (novelty seeking, harm avoidance, reward dependence and persistence) and 3 dimensions of character (self-directedness, cooperativeness and self-transcendence).

Statistical analyses showed a significant effect for novelty seeking and harm avoidance. Compared with controls, patients with painful endometriosis had lower scores for novelty seeking (p = .017) and, compared with patients with pain-free endometriosis, for the subdimension of exploratory excitability (p = .034). Patients with painful endometriosis had higher harm avoidance than did patients with pain-free endometriosis (p = .007); for the subdimension of fatigability, they had higher values compared with both controls (p = .032) and pain-free endometriosis patients (p = .001).

No significant differences were found for any of the 3 character dimensions, although the women with painful endometriosis showed a lower score for the self-
directedness subdimension of responsibility than those with pain-free endometriosis ($p = .027$).

**Conclusions and Clinical Implications**

The study results, overall, did not suggest that women who experienced pelvic pain with endometriosis have a specific personality profile but did show the importance of individual differences in women’s experience of chronic pelvic pain. Findings suggested that fatigue is associated with pelvic pain rather than endometriosis itself, and women with painful endometriosis may be more likely to develop a sickness response, leading to increased stress and depression. The authors concluded that “treatment of endometriosis (especially when painful) requires an integrated approach combining medical and psychological intervention” and should be targeted to each woman’s individual differences.


**Assessing Risk of Miscarriage With Endometriosis**

whether endometriosis has an effect on pregnancy outcome, particularly the risk of miscarriage, has not been conclusively determined. To obtain more solid evidence for a relationship between endometriosis and miscarriage, Leonardi et al from Ospedale Maggiore Policlinico, Italy, studied women who achieved singleton pregnancies with in vitro fertilization (IVF), because these patients are actively followed in the early stages.

Records were reviewed for 626 women (age range, 18–42 years) who underwent IVF, with or without intracytoplasmic sperm injection, between January 2008 and June 2014. Included were 313 women with a history of surgery for endometriosis or who had documented ovarian endometriomas at the time of the IVF cycle. Matched with them by age, type of cycle (fresh or frozen embryo transfer) and study period were 313 women without endometriosis. Pregnancy was assessed by serum levels of human chorionic gonadotropin (hCG) 14 days after oocyte retrieval, with a second assessment scheduled 48 hours later for women found to be pregnant. Transvaginal sonography was then performed 2 weeks later (4 weeks after embryo transfer). Miscarriage was defined as the interruption of pregnancy within 12 weeks of gestation.

Pregnancy was achieved for 235 women (75%) in each group during a cycle with fresh embryo transfer. The odds ratio (OR) of miscarriage for the affected women was 0.76 (95% confidence interval [CI], 0.50–1.16). After adjusting for body mass index, parity, duration of infertility and male factor infertility, the OR was 0.81 (95% CI, 0.53–1.25). No other variable analyzed (fresh vs frozen cycle, embryos transferred, presence of endometriomas or history of endometriosis surgery) was found to significantly increase the risk of miscarriage.

**Conclusions and Clinical Implications**

Based on these results that showed no association between endometriosis and spontaneous abortion for women who achieved singleton pregnancies with IVF, the authors concluded that women with endometriosis do not appear to have an increased risk of miscarriage. While it is plausible to apply this conclusion to women conceiving naturally, “well-designed epidemiological studies” are needed for confirmation.


**Body Mass Index and Pregnancy Outcomes**

A n increasing percentage of women seeking treatment for infertility are obese, which is not surprising in light of current population trends. While the outcome of in vitro fertilization (IVF) could potentially be affected by a woman’s body mass index (BMI), research has provided inconclusive results. Provost et al from Duke University Medical Center, North Carolina, used data from the Society for Assisted Reproductive Technology registry from 2008 to 2010 to examine the effect of BMI on IVF outcomes.
The 239,127 fresh autologous cycles reviewed were divided into cohorts based on the World Health Organization guidelines for female BMI; women with a normal BMI (18.5–24.9 kg/m\(^2\)) were used as the reference group. Examined outcomes included rates of implantation, clinical pregnancy, pregnancy loss and live birth. To isolate the effects of obesity from other underlying conditions, women whose infertility was specifically related to polycystic ovary syndrome (\(n = 34,137\) cycles) or to male factor (\(n = 89,354\) cycles) were analyzed separately.

More than half the cycles (134,588) were in the reference group. Patients with BMI lower than normal had results comparable to those in the reference group. As BMI increased above 18.5 to 24.9 kg/m\(^2\), statistically significant differences were found between each cohort and the reference group. There were progressively decreasing rates for

- implantation: from 29.5% for normal-BMI patients to 20.3% for those in the highest BMI category (>50 kg/m\(^2\); odds ratio [OR] 0.91; 95% confidence interval [CI], 0.88–0.95; \(p < .001\))

- clinical pregnancy: from 37.9% to 30.0% (OR 0.66; 95% CI, 0.53–0.82; \(p = .002\))

- live birth: from 31.4% to 21.2% (OR 0.52; 95% CI, 0.41–0.66; \(p < .001\))

Conversely, the pregnancy loss rate increased progressively, from 11.3% for the reference group to 20.3% for those in the highest BMI cohort (OR 1.87; 95% CI, 1.18–2.95; \(p = .007\); Table 1).

The subgroup analyses showed a similar negative impact on IVF outcome for patients with polycystic ovary syndrome or whose infertility was attributed to male factor, although not all the differences from the reference group reached statistical significance.

### Conclusions and Clinical Implications

The size of the dataset for this study strengthens claims that IVF outcomes are most favorable for women with low and normal BMI and that increasing BMI has a detrimental effect. However, the authors noted that, even for the group with the highest BMI, the IVF success rates were higher than the rates for some other poor-prognosis patients, such as those with diminished ovarian reserve. Thus, they concluded that “limiting access for poor prognosis alone seems unwarranted.” They advised discussing weight with obese patients and treating each one on an individual basis, including consideration of other health issues. While weight loss can be recommended, how much weight loss would be needed to improve outcomes has not yet been studied.


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**Table 1. Results for all autologous cycles by BMI category**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>&lt;18.5</th>
<th>18.5–24.9</th>
<th>25–29.9</th>
<th>30–34.9</th>
<th>35–39.9</th>
<th>40–44.9</th>
<th>45–49.9</th>
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<td>54,822</td>
<td>24,922</td>
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<td>Implantation rate, %</td>
<td>30.4</td>
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<td>28.3</td>
<td>26.9</td>
<td>25.8</td>
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<tr>
<td>p value(^b)</td>
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<td>&lt;.001</td>
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<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
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</tr>
<tr>
<td>Clinical pregnancy rate, %</td>
<td>37.7</td>
<td>37.9</td>
<td>36.8</td>
<td>35.7</td>
<td>33.7</td>
<td>32.0</td>
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</tr>
<tr>
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<td>.013</td>
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<td>&lt;.001</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
<td>.002</td>
</tr>
<tr>
<td>Pregnancy loss rate, %</td>
<td>11.4</td>
<td>11.3</td>
<td>12.7</td>
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<td>15.3</td>
<td>14.8</td>
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<td>.009</td>
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<td>.007</td>
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<tr>
<td>Live birth rate, %</td>
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<td>31.4</td>
<td>29.8</td>
<td>28.0</td>
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<tr>
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</tr>
</tbody>
</table>

\(^a\)All outcomes are per cycle start except for pregnancy loss (per clinical pregnancy).

\(^b\)p values calculated by means of analysis of variance for each category compared with the reference group. Statistical significance defined as \(p < .05\).

\(^c\)Calculated for cases in which a pregnancy outcome was recorded in Society for Assisted Reproduction Technology Clinic Outcome Reporting System.
Frozen–thawed embryo transfer (FET) after in vitro fertilization is increasingly replacing transfer of fresh embryos, especially with single-embryo transfer. To provide an optimal uterine environment for implantation, embryo thawing and transfer may be synchronized with either a natural menstrual cycle (NC-FET) or an artificial cycle (AC-FET) that mimics the natural cycle by consecutive administration of estrogen and progesterone.

Groenewoud et al from Leeuwarden Medical Centre and 16 other fertility centers in the Netherlands compared the 2 methods with an open-label, non-inferiority, prospective randomized controlled trial conducted from 2009 to 2014. A non-inferiority trial aims to show that an intervention is not worse than the one with which it is compared by more than a prespecified small amount, termed the non-inferiority margin.

The participants included 959 women (mean age, 33.5 years) who had been randomized to receive either AC-FET ($n = 464$) or a modified NC-FET (mNC-FET; $n = 495$) in which ovulation was triggered by administering human chorionic gonadotropin instead of estimating the time of ovulation by the surge in luteinizing hormone as in a true natural cycle. The primary outcome measure was live birth; rates of clinical pregnancy and ongoing pregnancy were secondary outcomes. Transfer for 101 of the mNC-FET group and 124 of those in the AC-FET group was canceled, in most cases because of inadequate embryo survival.

Of the 394 women who received mNC-FET,
- 94 achieved clinical pregnancy
- 57 had an ongoing pregnancy
- 57 had a live birth

Of the 340 women who received AC-FET,
- 75 achieved clinical pregnancy

Rates for the total study group are shown in Figure 1. Statistical analyses showed that live birth rates after AC-FET were not inferior to those achieved by mNC-FET, and there were no significant differences in rates of clinical and ongoing pregnancy.

**Conclusions and Clinical Implications**

With data showing that AC-FET was not inferior to mNC-FET, the authors concluded that patients may be treated with either method in preparation for embryo transfer. Which one to use should be decided by the patient’s preference and the logistics of the fertility clinic.


**Figure 1.** Rates for the total study group of 959 women.

- 45 had an ongoing pregnancy
- 41 had a live birth

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