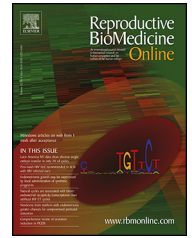




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ARTICLE

Adverse pregnancy and neo-natal outcomes after assisted reproductive treatment in patients with pelvic endometriosis: a case-control study



Marianne Jacques^a, Thomas Freour^{a,b,c}, Paul Barriere^{a,b,c},
Stéphane Ploteau^{a,b,*}


^a Department of Obstetrics, Gynecology and Reproductive Medicine, Centre Hospitalier Universitaire, Nantes, France;

^b Faculty of medicine, University of Nantes, France; ^c INSERM UMR1064, Nantes, France

* Corresponding author. E-mail address: stephane.ploteau@chu-nantes.fr (S Ploteau).



Stéphane Ploteau studied medicine at Nantes University and completed his internship at the Université Catholique de Louvain (UCL). He is Associate Professor in Anatomy and Gynecology-Obstetrics. He is certified in Gynecology-Obstetrics with orientation in reproductive medicine, specializing in reproductive surgery and endometriosis. His main scientific fields of interest are preservation of fertility and physiopathology of endometriosis.

Abstract To assess the impact of endometriosis on obstetric outcomes and to determine whether the severity, location and surgical treatment of the disease before the pregnancy had an impact on the prevalence of these disorders, a monocentric, case-control study was performed. In total, 113 pregnancies obtained by assisted reproductive treatment among patients with endometriosis were matched with control selected among assisted reproductive treatment pregnancies due to male infertility. The main result measures were pregnancy outcome at the obstetrical and neo-natal levels. The incidence of first trimester bleeding, pre-eclampsia, premature delivery threat, pelvic pain and Caesarean section was significantly higher ($P < 0.05$) in women with endometriosis. Except for gestational diabetes and intrauterine growth restriction (IUGR), the severity, location of lesions and surgical treatment of endometriosis did not have an impact on either pregnancy outcome or risk of obstetric complications. The IUGR is mainly due to deep locations and the revised American Fertility Society (rAFS) stages III–IV. Newborns with a mother suffering from endometriosis are at greater risk of being premature, smaller for their gestational age and more frequently hospitalized than the control group. Deep location of endometriosis is associated with more prematurity, hospitalization and smaller birthweight than ovarian locations. 

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KEYWORDS: caesarean section, deep location, endometriosis, pelvic pain, pre-eclampsia, premature delivery

Introduction

Endometriosis is characterized by the presence of endometrial tissue composed of glands and stroma outside the uterine cavity (Burney and Giudice, 2012). This disease is described as benign, chronic, inflammatory and oestrogen-dependent (Giudice and Kao, 2004). The prevalence of endometriosis is difficult to estimate, but it affects around 11% of women worldwide (Buck Louis et al., 2011). Although the influence of this disease on pregnancy occurrence is well known, its impact on pregnancy outcome is less researched. However, several retrospective studies have highlighted an increased rate of miscarriages for women with endometriosis and a recent meta-analysis concluded that there was an increased miscarriage rate for pregnancies achieved by assisted reproductive techniques for women with endometriosis (Barbosa et al., 2014). Nonetheless, studies are controversial and surgical treatment of the disease before pregnancy could modify the occurrence of miscarriages (Brosens et al., 2012a). With regard to the emergence of complications during pregnancy, Stephansson et al. found, in a nationwide cohort of 1,442,675 singletons including 13,090 women with endometriosis, a moderate but significant increase of pre-eclampsia (Stephansson et al., 2009). Similar results were shown for premature labour, placenta praevia and Caesarean section (Conti et al., 2014; Fernando et al., 2009). Conversely, another study reported a decreased rate of pre-eclampsia associated with endometriosis (Brosens et al., 2007). Lastly, a retrospective cohort study concerning neo-natal outcomes of assisted reproductive treatment pregnancies highlighted an increased rate of premature births associated with ovarian endometriomata (odds ratio [OR] 1.98 (95% confidence interval [CI] 1.09–3.62) (Fernando et al., 2009).

According to discrepancies within the literature, the aim of this study was to analyse the potential association between endometriosis and the risk of adverse assisted reproductive treatment pregnancy or neo-natal outcome.

A secondary aim was to determine whether the severity or topography of the disease could have a different impact on the obstetric and neo-natal outcome of pregnancies obtained by assisted reproductive techniques.

Materials and methods

Data collection

This was a retrospective monocentric case-control study. Pregnancies that occurred within the reproductive medicine care unit of Nantes university hospital (France) between 1 January 2009 and 14 May 2014 were considered.

Selection criteria were gathered from the study of medical files. Each woman matching the inclusion criteria, who had an ongoing pregnancy, was contacted by phone in order to obtain their consent for the use of their personal data in the context of this study.

All patients gave written informed consent for the procedures, digital recording and the use of data related to their medical history. The database and its use for research purposes has been declared and approved by the CNIL on 9 December 2014 (French National Commission on Informatics and Freedoms, reference number RC14_023).

Data collection was made from the elements of the medical file of each patient. A phone questionnaire was only used to complete potential missing data.

The data collection was achieved according to a standardized questionnaire (in the Appendix S1). Questionnaire data were registered on individual forms and EpiData Software version 3.1 (EpiData Association, Odense, Denmark) was used for data entry.

Study population

Cases and control cases were matched in relation to four criteria: age (plus or minus one year), primary or secondary infertility, IVF with or without intra-cytoplasmic sperm injection (ICSI) and singleton or twin pregnancy.

Study criteria

The severity, location, clinical signs and surgical care of endometriosis, women's reproductive history, age, body mass index (BMI), obstetric data and delivery, intrauterine fetal development and extra uterine cardio-pulmonary newborn adaptation assessed by 5-minute Apgar score (Casey et al., 2001), were analysed.

Statistical methods

Qualitative variables are represented by percentages and OR with a 95% CI based on normal distribution. The description of quantitative variables is based on the mean and standard deviation of the population.

Chi-squared test or Fisher's exact test were used to compare qualitative variables. A Student's t-test was used to compare quantitative variables. Significance level was set at 5%.

The statistical analysis was done using the EpiData Analysis Software, version 2.2 (EpiData Association, Odense, Denmark).

Resources

The revised scores of the American Fertility Society (rAFS) were used to classify the disease according to location and severity (American Society for Reproductive Medicine (ASRM), 1997)

Results

Study population

Among all pregnancies that occurred within our reproductive medicine care unit during the period covered by this study ($n = 2315$), a total of 160 pregnancies were identified among patients with endometriosis. The study flow chart is shown in Figure 1. Forty-four pregnancies in the endometriosis group

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