

# Understanding Confusing Disease Endometriosis

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## Abstract

Common gynaecological diseases, endometriosis, though known for last 300 years, its etiology, diagnosis and treatment are still not very well established, often mistaken with other diseases. In this short review, recent developments are focused. For the benefit and privacy of the patients Apps like "Citizen Endo" "Phendo" designed. Recently in the growth of endometriosis compounds such as, estrogens, cytokines, growth factors and lipopolysaccharides (LPS) were shown involve. Since no specific treatments are available, recently developed Fecal Microbiota Transplant (FMT) technology was also tried successfully albeit in few cases.

**Keywords:** FMT technology; "Phendo" and "Citizen Endo" Apps; Endometriomas; Fusobacterium

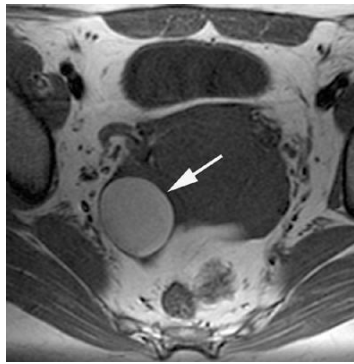
## Introduction

It was estimated that one in ten females babies are born with uterus suffer from endometriosis, meaning the tissue similar to the endometrial, the inner lining of the uterus grows abnormally on extra-uterine locations such as, ovaries, fallopian tubes, vagina, peritoneum, bladder, uterus, intestines, rectum, diaphragm and pelvis often causing painful lesions. This painful disorder was known to gynaecologist even over 300 years ago. In spite of how common and debilitating, still it is "Hidden Disease" because of stigma around menstrual problems and the normalization of female pain [1]. Due to developing "Citizen Endo" and an app called "Phendo" [2] designed to phenotype <https://citizenendo.org/phendo/>, or characterize, endometriosis currently, more than 15,000 users in several to track their symptoms and pain management techniques. Elhadad [3] has also partnered with the period tracking app clue to compare endometriosis with a healthy menstrual cycle. Pathology of endometriosis was unknown until the involvement of estrogen, cytokines, growth factors and initial inflammatory compounds such as lipopolysaccharides (LPS) which are important outer membrane components

of gram-negative bacteria mediators known in the growth of endometriosis [4]

## Endometriomas

Endometriomas may be considered as the most serious threat to a woman's reproductive potential since, sometimes these endometriotic cysts can become cancerous too. Endometriomas are most commonly found in the ovaries, filled with dark brown endometrial fluid and are sometimes referred to as "chocolate cysts." The presence of endometriomas indicates a more severe stage of endometriosis. The endometrial-like tissue on organs as mentioned above normally thickens, breaks down and bleeds with each menstrual cycle and due to lack of way to exit the body, gets trapped inside the body. When such type of growth takes place in the ovaries they are identified as Endometriomas (Figure. 1). In patients with no other infertility factor who wish to conceive soon, surgery may be indicated. It is also suggest that endometrioma larger than 3 cm should be removed before In Vitro Fertilization (IVF).



**Figure 1: Growth of endometrial tissue outside the uterus**

Magnetic resonance image of an endometrioma. Note the characteristic high signal intensity (similar to that of fat) of this right-sided adnexal endometrioma (arrow). Subjects with endometriosis suffers with health problems such as painful periods (dysmenorrhea), pain during intercourse, pain during bowel movements or urination, excessive bleeding, infertility, fatigue, diarrhoea, constipation, bloating or nausea especially during menstrual periods, dyspareunia, hematuria, dysuria, and dyschezia. In addition to the symptoms mentioned above, few may also suffer with pain in the catamenial pneumothorax, cyclical cough, and cyclical scar edema [5].

#### Causative Factors

Infection by a particular group of bacteria could be linked to endometriosis, *Fusobacterium* since, nearly two-thirds of the women with endometriosis tested positive for *Fusobacterium*, a genus of bacteria that can contribute to gum disease and other illnesses of the mouth, gut and in their uterine lining. Previously, nobody thought that endometriosis could be due to a bacterial infection. Yutaka Kondo, co-author is of the opinion that this very new idea offers a possible link between endometriosis and a common bacteria which can be treated with antibiotics [6]. In a study of 155 women in Japan, members of the bacterial genus *Fusobacterium* were found in the uterus of around 64% of those with endometriosis, and 7% of those who do not have the condition [6].

#### Endometriosis so hard to diagnose

One of the most common gynecological diseases, endometriosis often goes undetected for years because the abdominal pain associated with the condition mistaken for menstrual cramps, or asymptomatic. Difficulty to diagnose could be due to symptoms vary considerably as well as many other conditions also cause similar symptoms and different clinical presentations. The paradox with endometriosis is that, those with the largest amount of endometrial implants have the least amount of pain [7]. Endometriosis imitate other pathological conditions with pelvic pain, such as pelvic inflammatory disease (PID) or ovarian cysts, diagnosis becomes difficult and confused with irritable bowel syndrome (IBS), where bouts of diarrhoea, constipation and abdominal cramping could be observed. Situation becomes more complicated when IBS exists with endometriosis in therapeutics [8].

#### Women's health and Endometriosis

Kondo and his colleagues analysed endometrial tissue from women with and without the disease. They found that samples from those with endometriosis were more likely to host bacteria belonging to the genus *Fusobacterium*. *Fusobacterium* were often found in the mouth, gut and vagina, and have been linked to other conditions, such as gum disease. To see whether *Fusobacterium* could affect the course of endometriosis directly, the team transplanted endometrial tissue from one set of mice into the abdominal cavity of another [6]. Within weeks, endometriotic lesions formed in the recipient mice. Using this model, the researchers found that lesions tended to be more abundant and larger in mice that had also been inoculated with *Fusobacterium* than in those free of the bacteria. Treating

the mice with the antibiotics metronidazole or chloramphenicol, administered vaginally, reduced the development of endometriosis, and shrank the number and size of the lesions. Degraded endometrial tissue during menstruation gets backflow, and subsequent attachment or invasion into the pelvis results in a physical or chemical tissue stress reaction in patients suffering with endometriosis [1,9]. Right now the only treatments for endometriosis are hormonal medications, such as birth control pills, or surgery to remove the reproductive organs, according to the Mayo Clinic [10]. Immune–endocrine cross-talk between estrogen and bacterial endotoxin, a potential inflammatory mediator in the pelvic environment, could be involved as an additive inflammatory response and growth of endometriosis since, estrogen is also capable of inducing a pro-inflammatory response and endometriosis is a hormone dependent disease. Authors have a strong claim from series of studies that bacterial contamination in menstrual blood could also be the effect of endometriosis as well as capable of inducing the development of endometriosis since, they demonstrated that LPS regulates the expression of HGF and its receptor, c-Met, in the PF, ESCs, and EECs [11]. Differential treatment pattern is in vogue since, not all treatments work well for all women with endometriosis. Therapeutically analgesics such as non-steroidal anti-inflammatory drugs and hormonal treatment, such as low-dose combination oral contraceptives such as ethyl estradiol and progestins is in practice initially for every subject [4] followed by surgical excision of lesions, non-drug therapies, hormonal and non-hormonal therapies, or any of those approaches in combination depending on the situation. Non-drug therapies focus on dietary intervention, physical therapy, and psychological intervention. Dietary interventions have been proved to have a satisfactory positive impact on endometriosis. For example, omega-3 polyunsaturated fatty acids (o-PUFAs) were found to lower patients' pain scores [4;12]. Due to the role of gut microbiota in the development of endometriosis, FMT could be an innovative treatment option for the treatment of endometriosis [13-15]. Complete cure from Endometriosis is difficult since symptoms may return after the treatment is stopped or, in the case of surgery, as more time passes after the procedure [12]. Complete cure from Endometriosis is difficult since symptoms may return after the treatment is stopped or, in the case of surgery, as more time passes after the procedure

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