



Endometriosis and Oral Health: An Unsolved Mystery

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Abstract

Endometriosis is a pathological entity characterized by abnormal growth of endometrial tissue in ectopic sites which induces a chronic inflammatory reaction, scar tissue and adhesions that may distort a woman's pelvic anatomy. The signs and symptoms of the disease may be contributed to the generalized inflammatory response of the disease. In women with endometriosis, the peritoneal fluid is becomes dynamic with the increased number of activated macrophages and important differences in the cytokine/chemokine profile. Keeping in mind the inflammatory milieu which endometriosis creates; it would be interesting to analyze its effect on similar health conditions affecting the other parts of the body as well including mouth. Oral health is a key indicator of overall health, well-being and quality of life. Periodontal disease is a chronic inflammatory disease of periodontium and is characterized by periodontal ligament loss and destruction of surrounding alveolar bone. It is the main cause of tooth loss. The present article reviews the possible mechanism of association between Endometriosis and Oral Health. The literature search reveals three possible mechanisms include Oxidative Stress and Increased Reactive Oxygen Species (Ros) Production, Global Immune Dysregulation and Hormonal dysregulation. Endometriosis still remains a mystery to most of the gynaecologists throughout the world. It would be interesting to understand in detail whether an etio-pathogenic link exists between endometriosis and oral health. Further, population based longitudinal studies are required to assess the possible link to ensure comprehensive treatment for the patients suffering from endometriosis. Multidisciplinary approach is the key.

Keywords: Endometriosis; Infertility; Population; Pain; Oral Health

Endometriosis is a pathological entity characterized by abnormal growth of endometrial tissue in ectopic sites which induces a chronic inflammatory reaction, scar tissue and adhesions that may distort a woman's pelvic anatomy. It is a potential cause of pelvic pain and infertility and affects 6%-10% of reproductive-age women globally [1]. The disease has still remained a big challenge for the gynaecologists throughout the world. Although Carl Freiherr von Rokitansky described endometriosis in 1860, the disease was

considered as an ambiguous disorder along with unclear pathology for more than a century later [2].

The prevalence of endometriosis is varied. It affects up to 2 to 10% in fertile age group population. Among infertile women, its prevalence is increased up to 50%. The prevalence of endometriosis has been reported to be higher in women of Philippines, Indian, Japanese and Korean origins [3,4]. There has been yearly rise in the

incidence of endometriosis in Indian subcontinent with a range of 21 to 42% per 100 person-year population with a prevalence rate of 25% [5].

Endometriosis is often called as “the missed disease” due to vague and overlapping symptoms. The average time between onset of pain and diagnosis is nearly 8 years [6]. It may present itself in a varied fashion. The most common symptom being pelvic pain such as dysmenorrhea (pain at menstruation), dyspareunia (pain at intercourse), dyschezia (pain at defecation), and chronic pelvic pain. Painful endometriosis has huge psychosocial impact and is usually associated with depression and anxiety [7]. Chronic pain results in poor quality of life and has huge emotional impact of infertility, anger about disease recurrence, and uncertainty about the future regarding repeated operations or long-term medical therapy [8].

Though numerous theories have been proposed to explain the pathogenesis of the disease, the most accepted one still remains the Simpson’s theory. Initially proposed by Sampson in the 1920s, this theory explains the role of retrograde menstruation. According to this theory, eutopic endometrium is sloughed via patent fallopian tubes into the peritoneal cavity during menstruation [9].

Further, the signs and symptoms of the disease may be contributed to the generalized inflammatory response of the disease. In women with endometriosis, the peritoneal fluid becomes dynamic with the increased number of activated macrophages and important differences in the cytokine/chemokine profile. Increase in prostaglandins further worsen the situation resulting in clinical sequelae of pain and infertility. Inflammation is not only present in the peritoneal microenvironment, but also in the eutopic endometrium of women with endometriosis [10].

Keeping in mind the inflammatory milieu which endometriosis creates; it would be interesting to analyze its effect on similar health conditions affecting the other parts of the body as well including mouth.

Endometriosis and oral health

Oral health is a key indicator of overall health, well-being and quality of life. It includes wide range of diseases and conditions like dental caries, periodontal (gum) diseases, malocclusion, genetic disorders like cleft lip and palate, tooth loss, oral cancer etc. The

Global Burden of Disease Study 2017 estimated that oral diseases affect 3.5 billion people worldwide [11].

Most oral diseases and conditions share modifiable risk factors with the leading non-communicable diseases like cardiovascular diseases, cancer, chronic respiratory diseases and diabetes [11].

It would be interesting to know the association of Endometriosis with inflammatory diseases of mouth. Periodontal disease is a chronic inflammatory disease of periodontium and is characterized by periodontal ligament loss and destruction of surrounding alveolar bone. It is the main cause of tooth loss. The prevalence of the disease in Indian Population is as high as 60-97%. The prevalence has been reported to 57%, 67.7%, 89.6% and 79.9% in the age groups 12, 15, 35-44 and 65-74 years, respectively as per National Oral Health Survey and Fluoride Mapping 2004 [12,13]. It is more prevalent in individuals with altered host immune-modulatory response. Periodontal disease is linked to chronic systemic inflammatory burden secondary to the systemic dissemination of periodontal pathogenic bacteria, their products like lipo-polysaccharides and inflammatory mediators like interleukin [IL]-1 β , IL-6, tumor necrosis factor [TNF]- α , prostaglandin E2, and thromboxane B2). The same etio-pathogenesis may be attributed to endometriosis [14].

Possible mechanism of association (Review of Literature)

Numerous researchers have tried to assess the possible relation between Endometriosis and Periodontal health. Few important studies and their findings are:

- **Oxidative Stress and Increased Reactive Oxygen Species (Ros) Production** [14]: Thomas V., *et al.* (2018) conducted a Case-control study to study the association between endometriosis and periodontal disease. Periodontal screening was carried out in 25 women with endometriosis and 25 women without endometriosis. Severity of periodontal disease was classified based on the extent of loss of attachment. The proportion of women with severe periodontitis was seen to be higher among women with endometriosis (70%). It was hypothesized that the oxidative stress elsewhere like in endometriosis may augment the stress for endometriosis.

- **Global Immune Dysregulation [15]:** Kavoussi S.K., *et al.* conducted a survey to assess whether an association exists between endometriosis and periodontal disease, because endometriosis and periodontal disease are chronic, inflammatory processes more common in patients with systemic autoimmune disorders and because each disease alters immune modulators. The results of this study suggest a possible association between endometriosis and periodontal disease. Multinomial logistic regression showed that women with self-reported endometriosis had significantly (57%) higher odds of having both gingivitis and periodontitis relative to not having periodontal disease, compared with women without self-reported endometriosis. The findings were attributed to the hypothesis of Global Immune dysregulation. This accounts for the increased incidence of other systemic, autoimmune disorders for each ailment like systemic lupus erythematosus and rheumatoid arthritis as well as other autoimmune inflammatory conditions, hypothyroidism, allergies, fibromyalgia, asthma, and multiple sclerosis are more common in women with endometriosis.
 - **Hormonal dysregulation:** Endometriosis is one of a few estrogen-dominant conditions that affect women. Surveys confirmed oestrogen receptors in the jaw, and therefore woman's pain response may increase when oestrogen levels become affected. Although not much literature in this regard is available.
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Conclusion

Endometriosis still remains a mystery to most of the gynaecologists throughout the world. It would be interesting to understand in detail whether an etio-pathogenic link exists between endometriosis and oral health. Further, population based longitudinal studies are required to assess the possible link to ensure comprehensive treatment for the patients suffering from endometriosis. Multidisciplinary approach is the key.

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