Ultrasonographic findings in cases of dysmenorrhea

Thesis submitted for partial fulfillment of master degree in gynecology and obstetrics

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ABBREVIATIONS

AAGL	American Association of Gynecologic Laparoscopy
AFS	American Fertility Society
ASRM	American Society for Reproductive medicine
CO2	Carbone Dioxide
COX 2	Cyclooxygenase type 2
CT	Compound Tomography
CPP	Chronic Pelvic Pain
GIFT	Gamete Intra-Fallopian Transfer
GnRH	Gonadotropin-releasing hormone
GnRH-a	Gonadotropin-releasing hormone Agonist
IL	Interleukin
IUD	Intra-Uterine Device
LUNA	Laparoscopic Uterosacral Nerve Ablation
MMP	Matrix Metaloprotinase
MPA	Medroxy-Progesterone Acetate
MRI	Magnetic Resonance Imaging
NSAIDs	Non-Steroidal Anti-Inflamatory Drugs
ND;YAG	Neodymium: Yttrium- Aluminum-Garnet
OC	Oral Contraceptive
OCPs	Oral Contraceptive Pills
PF	Peritoneal Fluid
PG	Prostaglandin
PP-14	Placental Protein 14
PID	Pelvic Inflammatory Disease
TEN	Transcutaneous Electrical Nerve stimulator
US	Ultrasonography
VEGF	Vascular Endothelial Growth Factor
ZIFT	Zygote Intra-Fallopian Transfer

Abstract

Dysmenorrhea is the most common gynecological complain among adolescent and young adult females. Secondary dysmenorrhea is more likely to be associated with midcycle pain, dyspareunia, and metrorrhagia. The pain in secondary dysmenorrhea is caused by a variety of uterine abnormalities including polyps, fibroids, endometriosis, adenomyosis and uterine anomalies which can be easily discovered by using of ultrasound as a non-invasive technique.

Key Words:

- Dysmenorrhea.
- Endometriosis.
- Adenomyosis.
- Fibroid.
- Use of ultrasound to detect pelvic pathology.

INTRODUCTION

Introduction

Dysmenorrhea affects up to 80% of reproductive age women , in many cases causing sufficient pain to dramatically affect social and occupational roles. The prevalence varies across ethnic groups, which in part may reflect varying cultural attitudes toward women and menstruation. Key identified risk factors for dysmenorrhea include age of menarche, body mass, dietary habits, associated uterine bleeding disorders, combined pelvic pathology and psychological problems **(Brittany BS et al., 2008)**

Dysmenorrhea may be categorized into 2 distinct types: primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is menstrual pain without pelvic pathology, with onset typically just after menarche. Secondary dysmenorrhea is menstrual pain associated with underlying pelvic pathology and onset may be years after menarche **(Johnson SR. 2004).**

Endometriosis is a chronic benign gynecologic condition defined by the presence of functioning endometrial glands and stroma outside of the uterine cavity and musculature, It is a histological diagnosis made at the time of surgery. Endometriosis is estimated to affect 10% of reproductive age women, and is a leading cause of gynecologic hospitalization and hysterectomy. It is very costly in its effects on the quality of women's lives, expense for medical care and economic impact in the workplace **(Diane et al., 2001)**

Endometriosis is found predominantly in women of childbearing age, The mean age at diagnosis is 25-29 years. The most commonly associated symptoms are pain including non menstrual pain, dysmenorrhea and dyspareunia. Endometriosis is not uncommon among adolescents, approximately half of women under 20 years of age who have chronic pelvic pain or dyspareunia have the disease **(Dmowski et al., 1997).**

Most fibroids, even large ones, produce no symptoms at all, when symptoms occur, they often include the following changes in menstruation more bleeding, longer or more frequent periods, menstrual pain, vaginal bleeding at times other than menstruation, anemia, pain in the abdomen and lower back, usually of a dull, heavy, aching nature, but may be sharp during sex **(Andersen et al., 2001).**

Pelvic Ultrasonography should be part of routine gynecologic evaluation because it allows a more precise evaluation of the position of the uterus within the pelvis and provides more information about its size and irregularities. Pelvic sonograms also help in the early detection of uterine fibroids and endometrial polyps and help demonstrate the presence of ovarian cysts, adnexal masses and endometriosis **(Garcia et al., 2006).**

DYSMENORRHEA

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Primary Dysmenorrhea

Dysmenorrhea, or painful menses, is the most common gynecologic complaint among adolescent and young adult females, and is the leading cause of recurrent short-term school or work absenteeism Studies have shown that dysmenorrhea can affect adolescents' academic performance and their social and recreational activities. In an epidemiologic study conducted in adolescents, 60% to 70% reported painful periods and 15% reported an interruption of their daily activities because of menstrual pain ***(Andresh B et al., 1982)***.

The pain of primary dysmenorrhea can be mild (does not affect normal activity and requires only minimal analgesic help), moderate (some reduction in regular activity and requires regular use of analgesics), and severe (unable to carry out regular activities and analgesics are typically not helpful). Severe pain is often associated with nausea and emesis ***(Greenfield TP et al., 2006).***

Primary dysmenorrhea typically begins 6 to 12 months after menarche, although it may not be noted until the third gynecologic year after menarche. The pain usually lasts 1-3 days typically initiating with the menstrual flow or up to several hours after menses begin; sometimes it occurs several to 48 hours before the menstrual flow starts ***(Hillen TIJ et al., 1999.)***

Nearly two-thirds of ovulating females have some menstrual discomfort for 1-3 days of most ovulatory menses, with nearly half of them having mild pain, one-third having moderate pain, and 14% reporting severe pain. Primary dysmenorrhea is the most common medical cause of school or job absence and its incidence rises from the early teenage years through young adulthood and first pregnancy ***(Greydanus DE et al., 2007)***

Pelvic abnormalities, such as endometriosis or uterine anomalies, are only identified in approximately 10% of adolescents with severe dysmenorrhea symptoms Thus, the majority of chronic pelvic pain (CPP) in adolescent patients is primary, or functional, that is it is associated with normal ovulatory cycles, no pelvic pathology, and has a clear physiologic etiology ***(Draznin MD et al., 2006).***

The classic pathophysiologic explanation for primary dysmenorrhea is an overproduction of prostaglandins (PGs) within the endometrium (Fig. 1). After ovulation, ω-6 fatty acids accumulate in cell membranes, and upon progesterone withdrawal (just before the onset of menstruation), these ω-6 fatty acids, particularly arachadonic acid, are released initiating a cascade of reactions that ultimately leads to the production of various PGs and leukotrienes (LTs) in the uterus. This overabundance of ω-6 fatty acids, relative to ω-3 fatty acids, may be the result of the high intake of ω-6 fatty acids in the western diet. ***(Simopolous AP et al., 1991)***

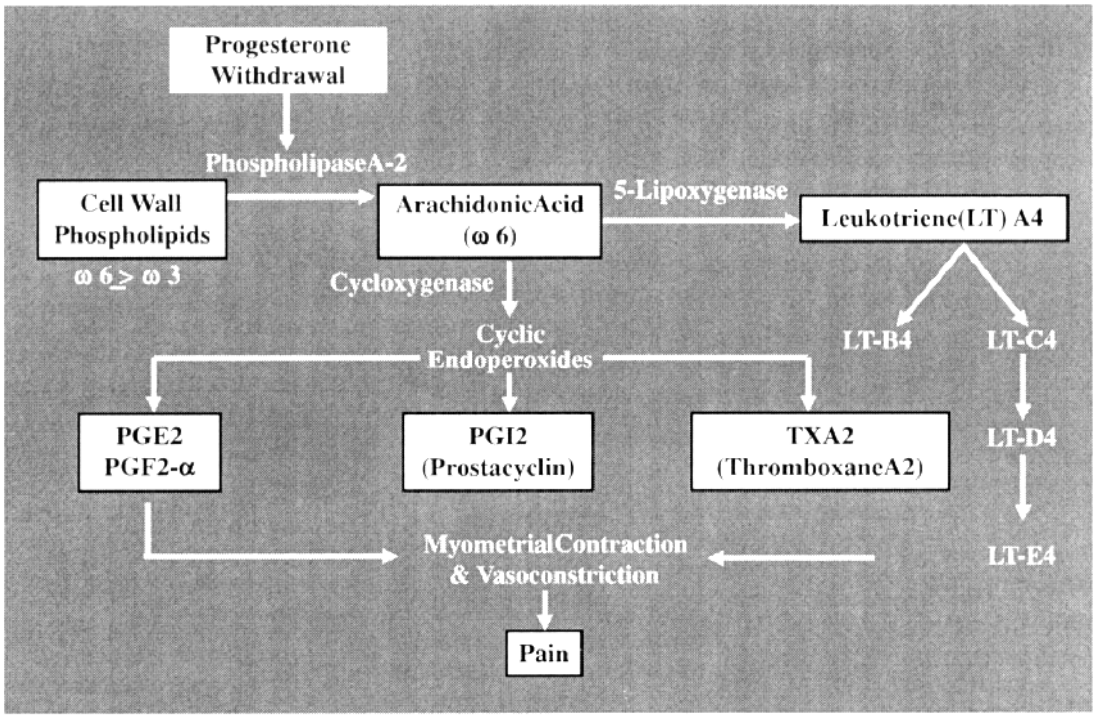

FIGURE I. Pathophysiology of dysmenorrhea.(Simopoulos AP.1991)

The PGs and LTs produced are biochemical byproducts of ovulation and inflammatory modulators known to cause myometrial contractions and vasoconstriction. Their actions are thought to result in local tissue ischemia, which is ultimately responsible for the typical crampy pain of dysmenorrhea. ***(Kaplowitz PB et al., 2008)***

There is increased resting tone of the myometrium, heightened contractions (frequency and amplitude), and increased dysrhythmic contractions. Vasoconstriction induces ischemia of tissue as well as sensitization of myometrial neuronal endings to various pain-enducing chemicals. Those with primary dysmenorrhea have increased levels of circulating prostaglandins during menstruation (compared to those without such cramps). There may also be

increased sensitivity to circulatory prostaglandins and increased levels of vasopressin that can lead to increased myometrial contractions and more pain. ***(Greydanus DE et al., 1997)***

The reaction of individual adolescents to menstrual cramps can vary from some that are unable to continue regular activities to others that seem less affected. Also, menstrual cramps can worsen with psychological factors, such as depression or anxiety. In addition, dysmenorrhea may be aggravated by factors such as longer menstrual flow, obesity, and the copper IUD. Decreased pain may be seen with parity, regular exercise, oral contraceptives, NSAIDs, and the progesterone IUD. ***(Greydanus DE et al., 1997)***

A landmark study by Chan and Hill was the first report in support of this theory. They measured PGF2-α activity in menstrual fluid from tampons and found that PG activity was 2-fold higher in dysmenorrheic women when compared with their nondysmenorrheic counterparts. Subsequent studies have confirmed these results in both menstrual fluid analysis and in endometrial biopsy samples. This finding has obvious implication for the medical management of primary dysmenorrhea and CPP, although the PG pathway has been extensively investigated in association with dysmenorrhea, the LT pathway is less well studied, leading to a paucity of published information. ***(Hillen TIJ et al., 1999)***

Symptomatology There may be a constant ache with superimposed crampy or spasmodic pain that is bilateral and symmetrical; the pain is localized to the lower abdomen but can radiate to the lower back or anterior thighs. A variety of additional