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Comparing the Pattern of Primary Dysmenorrhea Before and After Childbirth

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ABSTRACT

Background & aim: Dysmenorrhea also known as menstrual cramp or painful period is one of the most prevalent health issues among women. There are contradictory evidence regarding the impact of childbirth on the occurrence of dysmenorrhea. Also, only pain severity has been examined, as one of the clinical features of dysmenorrea in most related literature and the other characteristics of pain including duration, quality, location, as well as the associated symptoms have been overlooked. Therefore, the present study aimed to compare the patterns of primary dysmenorrhea before and after childbirth in primiparous women.

Methods: In this cross-sectional study, 124 primiparous women with only one delivery were examined. The multistage sampling method was used to select the subjects who referred to the healthcare centers of Mashhad, Iran in 2010. The research tools included a demographic questionnaire, a form to record menstrual pattern, and verbal multidimensional scoring system for assessment of severity of dysmenorrhea. Data were analyzed by Wilcoxon signed-rank test and Cohen's kappa coefficient using SPSS.

Results: The findings showed statistical significant differences in all pain characteristics before and three cycles after childbirth including pain severity ($P_1<0.001$, $P_2<0.001$, and $P_3<0.001$), duration ($P_1<0.001$, $P_2<0.001$, and $P_3<0.001$), quality ($P_1<0.001$, $P_2<0.001$, and $P_3<0.001$), location ($P_1<0.001$, $P_2<0.001$, and $P_3<0.001$), and associated symptoms ($P_1<0.001$, $P_2<0.001$, and $P_3<0.001$).

Conclusion: According to the results of this study, childbirth could alter the pattern of primary dysmenorrhea including severity, duration, quality, and location, as well as associated symptoms. It seems that childbirth could be accepted as a factor influencing the pattern of primary dysmenorrhea.

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Introduction

Dysmenorrhea considered as one of the most common complaints by women (1) can have undesirable effects on individual and social health status (2). The prevalence of dysmenorrhea has been reported as 25-75%; such difference can be due to the way patients express their complaints to doctors (self-report method) and the manner doctors raise their questions in this respect (3). The prevalence of this disorder in Iran was reported as 71-79% and is taken into account as the main cause of absenteeism from school and work (4, 5).

Dysmenorrhea can be divided into two types of primary and secondary. In this regard, the primary dysmenorrhea refers to the menstrual cramps in absence of any justifiable

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pelvic inflammatory diseases. The secondary dysmenorrhea is associated with the occurrence of painful periods due to pelvic pathologic problems (2, 6). In primary dysmenorrhea, no particular problem is seen in female genitals and pain starts simultaneously or a few hours before menstrual bleeding and lasts for a maximum of 2-3 days. Such pains are often observed in menstruations associated with ovulation (1, 7).

The quality of colicky pains or cramps is also diagnosable in the middle and supra-pubic line and sometimes spreads to lower back and groins (2, 8, 9). In addition, primary dysmenorrhea is sometimes associated with problems caused by prostaglandins in peripheral blood, such as nausea, vomiting, diarrhea, and headache (10, 11).

It should be noted that 10-15% of women experience severe symptoms disrupting 1-3 days in their monthly life which are considered as the common causes of absenteeism from work and decrease the quality of life (12, 13). Therefore, the given problem has also led to loss of millions of working hours (14, 15). However, there are several treatments to reduce dysmenorrhea (16, 17).

Numerous studies have been performed on determining the factors associated with dysmenorrhea, including weight, age, number of deliveries, diet, physical activity, smoking, and family history. The published results have inconsistently reported that childbirth can be mentioned among these factors (18, 19, 20, 21). Spiroff and Fritz citing the study by Andresch and Milsom in Sweden argued that women experiencing childbirth could significantly suffer from less severe primary dysmenorrhea than women who had never been pregnant or those who had a history of spontaneous or legal abortion (21).

Moreover, Symonds and Symondsian stated that the primary dysmenorrhea could disappear after birth of the first child (22). Juang and Yen (2006) also concluded that menstrual cramps dicrease in women with preterm childbirth, compared to those with full-term one. Furthermore, women with a history of natural childbirth indicated greater improvements in dysmenorrhea than those undergoing Cesarean section (23).

Firoozi and Zahedifard (2013) conducted a study on the effect of delivery mode on dysmenorrhea severity. According to their results, natural childbirth might lead to greater improvements in pain severity, in comparison to Caesarean section (24). However, other researchers did not report such a relationship and believed that childbirth has no impact on dysmenorrhea (25, 26). A point in the mentioned studies was that they examined the relationship between pain severity and mode of delivery and ignored the other components associated with pattern of dysmenorrhea. For example Shahri, Soleimani, and Sepandi (2013) as well as Nahidi, Bagheri, and Jansari (2007) investigated pain severity due to dysmenorrhea and mode of delivery (27, 28).

According to the Onset, Location, Duration, Characteristics, Aggravating Factors, Relieving Factors, Treatment (OLDCART) model as a pain assessment tool, several aspects other than pain severity, namely duration, location, quality, and pain symptoms should be considered. On the other hand, studies carried out on the impact of childbirth on the patterns of primary dysmenorrhea do not have similar results in Iran and the reference books of obstetrics and gynecology do not clearly illuminate the changes in this pattern. Consequently, the purpose of this study was to compare the patterns of primary dysmenorrhea before and after childbirth in women who referred to healthcare centers of Mashhad, Iran in 2010-2011.

Materials and Methods

This descriptive-analytic study on 124 mothers compared the pattern of primary dysmenorrhea before and after childbirth. The participants aged 18-35 years with children of 6-36 months old and had a history of delivery whether vaginal or Cesarean section. They had passed at least 6 cycles of postpartum menstruation onset and had also experienced a history of pre-pregnancy dysmenorrhea based on the verbal multidimensional scoring system for assessment of dysmenorrhea severity. Moreover, they did not have history of taking hormonal contraception methods or intrauterine device (IUD) before and after childbirth and did not suffer from postpartum secondary dysmenorrhea.

The exclusion criteria included pregnancy during the study period, changes in contraception

methods, and unwillingness to continue participation in the research. The multistage sampling method was similarly conducted on the community healthcare centers numbers one, two, and three in Mashhad. Proportional to the number of centers and patients of each center, the number of mothers was selected using the purposive sampling method according to the statistics from maternal care clinics.

That is, the names and contact numbers of people with a history of one delivery and with children aged up to 36 months who had used interruptive contraceptive method or condom were primarily extracted from the maternal care clinics. Next, these mothers were asked about the status of primary dysmenorrhea before pregnancy at an appropriate time via phone calls. The individuals whose responses were positive and were eligible to be included in the study at the time of interview were invited to participate in the study.

In order to follow the ethical considerations, the research objectives were explained to the participants and informed consents were obtained during a meeting at the healthcare centers. Afterwards, anonymous questionnaires were delivered to collect the data. The questionnaire included maternal demographic data, as well as information regarding delivery and lactation. In addition, the pre- and post-partum menstruation data for three consecutive months after entering the study, as well as a multidimensional scoring system for assessment of dysmenorrhea severity were completed.

Next, the pattern of primary dysmenorrhea was examined through raising five questions on pain duration, severity, quality, location, and symptoms associated with pain in the section related to menstrual information. Pain severity was also determined using the multidimensional scoring system for assessment of dysmenorrhea severity. The validity and reliability of the personal, childbirth, lactation, and menstrual information questionnaire were determined using content validity and internal consistency with Cronbach's alpha coefficient (α=0.79), respectively.

The multidimensional scoring system for assessment of dysmenorrhea severity used for determining primary dysmenorrhea was a standard instrument whose validity was confirmed by Andresch and Milsom (1982). It had been administered by Torshizi, Golmakani, Saadatjoo, and Rakhshandeh (2006) (29, 18) and the reliability had been confirmed by equivalent forms (r=0.92). According to the pilot study for comparing the ratios before and after childbirth with the confidence level of 95% and the test power of 80%, the sample size was determined as 124 individuals according to a study performed by Juang and Yen (2006).

It should be noted that the data from 144 participants were collected at first but a total number of 124 individuals were recruited because some mothers did not answer the phone calls or menstrual information were not recorded by mothers during follow-ups. Therefore, there was a drop out of 20 individuals. Following recording, the data were analyzed by paired Wilcoxon signed-rank and Cohen's kappa tests using SPSS version11.5. Furthermore, $P < 0.05$ was considered as significant in all tests.

Results

The data from 124 study subjects were analyzed. The pattern of primary dysmenorrhea regarding the components of pain severity, duration, quality, location, and symptoms associated with dysmenorrhea (five features of pain severity on the OLDCART) were evaluated before and after childbirth.

Moreover, we investigated the participants in terms of some variables, such as age (25.2±3.57 years), age at first menstruation (13.6±1.54 years), age at marriage (19.6±3.1 years), age of their children (22.6±8.06 months), menstruation onset, and postpartum menstruation (5.05±4.17 months), as well as the breastfeeding duration (8.1±5.61 months).

According to the findings of present study, 80.6% of the subjects suffered from dysmenorrhea grade 2 and 3 prior to childbirth (based on the multidimensional scoring system for assessment of dysmenorrhea severity). This value reduced to 20.9, 22.5, and 28.1% after delivery in the first, second, and third reports, respectively. Concerning the results of paired Wilcoxon signed-rank test, the dysmenorrhea severity significantly decreased after childbirth, compared to before birth (P_1<0.001, P_2<0.001, and P_3<0.001) (Table 1).

Furthermore, the results demonstrated that dysmenorrhea duration descended from 24.57

hours before childbirth to 14.83, 14.61, and 14.95 hours in the first, second, and third reports after birth, respectively. The difference in the duration of painful periods was also significant between the three reports given after childbirth, in comparison to before childbirth (P_1<0.001, P_2<0.001, and P_3<0.001).

Considering the dysmenorrhea quality, the findings revealed a change in the most prevalent type of pain from colicky state before childbirth to obscure, colicky, and colicky states in the first, second, and third reports, respectively (Table 2).

Given the dysmenorrhea location, the findings suggested that the location of pain mainly altered from the lower abdomen to the thighs to the lower abdomen after childbirth as observed in the three reports (Table 3).

Furthermore, we found a significant diminish in the frequency of symptoms associated with dysmenorrhea after childbirth, compared to before it. As a result, 76.6% of individuals reported more than one pain symptom before childbirth, while this value declined with a significant difference to 44.4, 43.8, and 42.5% in the first, second, and third reports after childbirth, respectively (P_1<0.001, P_2<0.001, P_3<0.001). It should be noted that the most common complaint associated with dysmenorrhea before and after childbirth was nausea.

Table 1. Comparing primary dysmenorrhea severity based on verbal multidimensional scoring system for assessment of dysmenorrhea severity before and after childbirth

Dysmenorrhea severity	Before childbirth N (%)	After childbirth			Paired Wilcoxon signed-rank test results
		Report one N (%)	Report two N (%)	Report three N (%)	
Grade 0	0 (0)	48 (38.7)	44 (35.4)	53 (42.7)	Before childbirth and the first report after childbirth z=-8.2, P < 0.001
Grade 1	24 (19.3)	50 (40.3)	52 (41.9)	36 (29)	Before childbirth and the second report after childbirth z=-8, P < 0.001
Grade 2	52 (41.9)	19 (15.3)	22 (17.7)	28 (22.5)	
Grade 3	48 (38.7)	7 (5.6)	6 (4.8)	7 (5.6)	Before childbirth and the third report after childbirth z=-7.8, P < 0.001
Total	124 (100)	124 (100)	124 (100)	124 (100)	

Table 2. Comparing dysmenorrhea quality before and after childbirth

Dysmenorrhea quality	Before childbirth N (%)	After childbirth			Cohen's kappa coefficient
		Report one N (%)	Report two N (%)	Report three N (%)	
Colicky pain	35 (28)	29 (23)	37 (30)	36 (29)	Before childbirth and the first report after childbirth K=0.608, P < 0.001
Stabbing pain	20 (16)	19 (15)	31 (25)	22 (18)	Before childbirth and the second report after childbirth K=0.266, P < 0.001
Obscure pain	22 (18)	36 (29)	29 (23)	24 (27)	
Pressing pain	12 (10)	13 (10)	11 (9)	8 (6.5)	Before childbirth and the third report after childbirth K=0.215, P < 0.001
Burning pain	5 (4)	3 (2.5)	1 (1)	4 (3.5)	
Rotating pain	6 (5)	6 (5)	8 (6.5)	14 (11)	
Other	24 (19)	18 (15)	7 (5.5)	6 (5)	
Total	124 (100)	124 (100)	124 (100)	124 (100)	

Table 3. Comparing dysmenorrhea location before and after childbirth

Dysmenorrhea location	Before childbirth N (%)	After childbirth			Cohen's kappa coefficient
		Report one N (%)	Report two N (%)	Report three N (%)	
Lower abdomen	23 (18.5)	37 (30)	33 (26.5)	35 (28)	Before childbirth and the first report after childbirth K=0.486, P < 0.001
Back	6 (5)	17 (14)	9 (7)	12 (10)	Before childbirth and the second report after childbirth K=0.196, P < 0.001
Lower abdomen spreading to back	15 (13)	17 (13.5)	27 (22)	35 (28)	
Lower abdomen spreading to thighs	28 (23)	15 (12)	23 (18.5)	22 (18)	Before childbirth and the third report after childbirth K=0.386, P < 0.001
Other	51 (41)	38 (30.5)	32 (26)	20 (16)	
Total	124 (100)	124 (100)	124 (100)	124 (100)	

Discussion

The findings of this study indicated that 80.6% of the individuals were suffering from dysmenorrhea grade 2 and 3. However, the results obtained by Nahidi et al. (2007) in Tehran concerning the impact of delivery mode on the primary dysmenorrhea revealed that about 20% of women in their study were inflicted with dysmenorrhea grade 2 and 3. This discrepancy can be attributed to age differences among the study subjects; this is, the mean age of subjects in the study by Nahidi et al. (2007) was 39.7 years which can increase the probability of making mistakes in recalling the events and reducing the accuracy (28).

The current study revealed a significant decline in the pain severity during the three-month follow-up after childbirth, compared to before childbirth. Despite the controversies in the reviewed literature (25, 26), there were investigations which agreed on the reduced severity of postpartum dysmenorrhea (21, 22, 23). For example, Shahri et al. (2013) in their study concluded that childbirth could generally moderate the primary dysmenorrhea but the mode of delivery was not effective in this respect because of the sampling method employed in their study. Moreover, these authors stated that the mode of delivery had no impact on the primary dysmenorrhea considering that most of the samples (81%) in the group with Caesarean section were cases having emergency Caesarean section. In addition, no difference was observed between women undergoing Cesarean section after the onset of childbirth pains due to increased prostaglandins and those with vaginal delivery (27).

One of the probable causes of the primary dysmenorrhea is associated with cervix in a way that the residues of menstrual blood in the uterus might lead to dilation of the myometrium and production of painful contractions due to a temporary blockage. Consequently, immediate relief of dysmenorrhea after full discharge of the blood and unobstructed menstrual flow support this theory.

According to Kase, Weingold, and Gershenon, patients with a history of dysmenorrhea often have a significant improvement after pulse on cervix following natural delivery, which can further prove the mentioned theory (30). However, there is no convincing evidence on cervical stenosis in patients with dysmenorrhea. Therefore, it is not well determined that treatment of cervical stenosis may improve the primary dysmenorrhea (31). Given that endometriosis is not considered as one of the causes of primary dysmenorrhea, Bulletti et al. (2010) examined the recurrence of endometriosis after vaginal childbirth. They argued that it could increase the inner diameter of the cervix and reduce the recurrent endometriosis and consequent dysmenorrhea (20).

Furthermore, prostaglandins have been identified as a causative factor affecting the primary dysmenorrhea. High levels of prostaglandins can augment contractions of myometrium resulting in reduced uterine blood flow as well as myocardial ischemia of the uterus. This in turn can lead to increased autonomic stimulation of uterus pain fibers. Women suffering from the primary dysmenorrhea have higher uterine basal tones. In addition, they show elevated frequency of contractions along with an uneven pattern of contractions created by stimulating prostaglandins (31).

Moreover, the concentration of norepine-phrine in uterus after childbirth cannot be the same as that before pregnancy. As a result, altered neuromuscular activities in the uterus are responsible for the observed reduction in painful periods after pregnancy (30). Other causes of pain may be related to anxiety, fear, and sense of guilt. In addition, stress whether of internal or external origins can affect the threshold of pain. Therefore, biochemical stimulation of pelvic pain fibers and interpretation of such stimulation by the central nervous system are among the important factors causing the primary dysmenorrhea. Both of the mentioned factors may be affected by emotions or might result in emotional responses.

Psychological and physiological responses are known as significant considerations in patients with severe menstrual cramps (32). Accordingly, accepting the role of psychological factors affecting dysmenorrhea is not irrelevant. It is assumed that childbirth experience, regardless of physiological impacts on the female reproductive structures, can also

influence the interpretation and understanding of pain in their nervous system. Giambrardino (2008) also stated that considering the fact that women give birth in pain and childbirth is a natural phenomenon, their menstruation is often painful and this is a normal phenomenon causing them to be able to tolerate much more pain (33).

Furthermore, some studies suggested that the primary dysmenorrhea is due to increased sensitivity of uterine adrenergic nerves. It seems that such fibers disappear at lower parts during pregnancy and only some parts are renovated after childbirth. These findings are consistent with the statements spelled out by pregnant women in terms of reduced painful periods after childbirth (30).

Our results also demonstrated a significant diminish in dysmenorrhea after childbirth. In an investigation on women and their visceral pains, Giambrardino (2008) argued that female reproductive organs are veterans and initiators of many visceral pains. The researcher concluded that more than 50% of women with dysmenorrhea have symptoms of irritable bowel syndrome and even present higher sensitivity with no obvious intestinal symptoms.

Women suffering from dysmenorrhea also have urinary tract stones, renal colic, and further reflective back hyper-allergy, compared to the women with only urinary tract stones. In comparison with the women suffering only from dysmenorrhea, they have more dysmenorrhea cycles and reflective hyper-allergy in the lower part of the abdomen. Dysmenorrhea can similarly raise pain and hyper-allergic irritable bowel syndrome and becomes more prominent with this syndrome.

The latter relationship between exacerbation of the genital, intestinal, and urinary symptoms has been confirmed by the fact that treatment of one of these two symptoms can cause significant reduction in the pain of others. For example, irritable bowel syndrome improves after effective treatment of dysmenorrhea, pain in the urinary tract due to stones decreases after laser therapy of the endometriosis, and dysmenorrhea enhances after removal of stone using the crusher (33). Therefore, this evidence and the effectiveness of a factor as described above, in reducing the prevalence and severity of dysmenorrhea can justify lowered pain duration as observed in this study. Changes in the pain quality from the reflective and obscure types to pectoral girdle pain, as well as changes in patterns of local pains and decrease in the pattern of multiple accompanied symptoms to a single symptom were observed. To our knowledge, no other studies were found regarding the other components of pain and their relationship with the mode of delivery. Unfortunately, the existing literature focused only on the component of pain.

Among the limitations of this study was that it was better to conduct such a study prospectively. It means include the subjects and record the data on patterns of dysmenorrhea before childbirth. However, it was virtually impossible to carry out such a plan due to lack of prediction about the occurrence of pregnancy and childbirth in married women. On the other hand, there is a time limit for study implementation. The data of this study can be used in giving advice and awareness to women with the primary dysmenorrhea concerning changes in the pattern of menstrual cramps after childbirth.

Conclusion

The results of present study demonstrated that childbirth might lead to alterations in the patterns of primary dysmenorrhea in terms of severity, duration, location, quality, and symptoms associated with pain, compared to those before the first pregnancy. Consequently, it seems that childbirth can be accepted as a positive factor moderating primary dysmenorrhea.

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Conflicts of interest

The authors declare no conflicts of interest.

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