

The Mean Change in Pain Score (before and after use) with Ginger for Management of patients presenting with Primary Dysmenorrhea

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ABSTRACT

Background: Pain due to primary dysmenorrhea is common among young women that have been reported to be severe in many of the young women, resulting in their incapacitation for the first 3–4 days of their menstrual cycle. Considering the contra-indications of chemical medications and their unwanted side effects, there has been an increase in the use of alternative treatments among women such as Ginger.

Aim: To see role of Ginger in reducing pain (on Visual analogue scale) in women presenting with primary dysmenorrhea

Methods: Quasi Experimental Study was carried out at Lahore General Hospital. The study population included 100 women presenting with primary dysmenorrhea ranging in age from 15-25 yrs.

Results: In this study the mean age of subjects was 19.20 ± 2.57 years with minimum age 15 years and 25 years. Pain related to primary dysmenorrhea before treatment was 7.86 ± 1.01 with minimum and maximum pain score 5 and 10 respectively on visual analogue scale (VAS). After 3 days of treatment mean pain score of primary dysmenorrhea was 4.03 ± 1.43 with minimum and maximum pain score 2 and 7 respectively on VAS. Mean change in pain score after treatment was 3.83 ± 1.21 on VAS. The mean change after treatment was significantly reduced p -value < 0.001 .

Conclusion: Through this study we found that Ginger is an effective treatment in significantly reducing pain severity in primary dysmenorrhea.

Keywords: Dysmenorrhea; adolescents; primary dysmenorrhea, complementary and alternative medicine, Ginger

INTRODUCTION:

Dysmenorrhea is painful menstruation (woman's monthly bleeding) with the symptoms including cramping, headaches, nausea and vomiting. An excess of the hormone prostaglandin is a known cause¹. Dysmenorrhea has a prevalence of 48-94% and causes of absence from school in 24% of the affected students.^{2, 3} Non-steroidal anti-inflammatory drugs (NSAIDs) are effective in relieving the pain of primary dysmenorrhea. They can have side effects such as nausea, dyspepsia, peptic ulcer and diarrhea⁴ Zingiber officinale (Z. officinale), commonly known as ginger, has been widely used traditionally for a variety of medicinal purposes, one of which is for the treatment of pain⁵. Ginger acts as an inhibitor on cyclooxygenase and lipooxygenase, resulting in an inhibition of leukotriene and prostaglandin synthesis.⁶ In literature it has been proved that NSAIDs for management of pain for primary dysmenorrhea in unmarried girls is not a good option due to side effects. Ginger is a natural product which has no side effects, can be beneficial for management of primary dysmenorrhea. But scarce data is available and in Pakistan no local study has been conducted yet. Moreover, previous studies have been conducted on small sample size. In this study we will take

appropriate sample size to get more accurate results. This study will help to improve our knowledge about the use of Zingiber officinale in primary dysmenorrhea that will be culturally more acceptable in our population

METHODOLOGY

A Quasi Experimental Study was carried out in Unit 1 Department of Obstetrics & Gynecology Lahore General Hospital. Sample size 100 cases is calculated with $d=0.30$, 95% confidence level and taking magnitude of mean pain score i.e. 4.61 ± 2.55 with ginger for management of patients presenting with primary dysmenorrhea⁹. Non-probability sampling was done. Unmarried girls of age 15 to 25 years presenting with complaint of primary dysmenorrhea (as per operational definition) were included. On the other hand, cases of mild dysmenorrhea having pain score < 3 and patients taking oral contraceptive pills for dysmenorrhea (on history/ medical record) were excluded. Six months after obtaining ethical approval of the study (from 24-10-2014 till 23-4-2015) 100 females who fulfilled the inclusion criteria were included in the study. Patients attending OPD of Department of Obstetrics and Gynecology, Lahore General Hospital, Lahore were recruited in the study. After taking informed consent, demographic variables (name, age, pain score, contact) were obtained. Pain score were measured on visual analogue scale at start of

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menstruation. Then females were given one 500 mg ginger powder per capsule. Females were advised to take capsule three times a day only for the first three days of the menstrual period. The change in pain score were measured after 3 days of treatment. The difference between pre and post treatment were taken as change in pain score.

Data analysis: The data were entered and analyzed through SPSS version 20. Quantitative variables like age pain score were presented as mean and standard deviation. The change in the mean pain score were determined by using paired t-test. $P \leq 0.05$ were considered as significant. Data were stratified for economical status, education level and $BMI \geq 30, < 30\text{kg/m}$ to address the effect modifiers. Post-stratification t-test was applied to compare the results

RESULTS

In this study the mean age of subjects was 19.20 ± 2.57 years with minimum age 15 years and 25 years (Table-1) There were 74 females whose age was 15-20 years and 26 females were 21-15 years old (Table-2).

According to socio economic status 52 females had ≤ 8000 and rest of 48 females had > 8000 income of their house hold (Table-3).

There 47 females who were illiterate, 46 were matriculation and 7 females had higher education (Table-4).

According to body mass index only 8 females were obese ($BMI \geq 30$) while the rest of 92 females had $BMI < 30$ (Table-5).

Pain related to primary dysmenorrheal before treatment was 7.86 ± 1.01 with minimum and maximum pain 5 and 10 respectively on VAS (Table-6).

After 3 days of treatment mean pain of primary dysmenorrheal was 4.03 ± 1.43 with minimum and maximum pain 2 and 7 respectively on VAS (Table-7).

Mean change in pain after treatment was 3.83 ± 1.21 on VAS. The mean change after treatment was significantly reduced $p\text{-value} < 0.001$ (Table 8 and 9).

We stratified our data and found that mean change in pain after treatment was 3.85 ± 1.24 in females 15-20 years of age while in females aged 21-25 years the mean change in pain after treatment was 3.77 ± 1.14 . There was no statistical significant difference in mean change in pain in both age groups, $p\text{-value} = 0.769$. Table-10

Mean change in pain after treatment was also same in relation to their education status, $p\text{-value} = 0.745$, i.e. in females having education < 10 years mean change in pain was 3.87 ± 1.26 and in females having education ≥ 10 years mean change in pain was 3.79 ± 1.18 (Table-11).

On splitting data for socio economic status and BMI we found no statistical significant difference in mean change in pain after treatment, $p\text{-value} > 0.05$ (Table 12, 13).

Table 1: Descriptive statistics of age (years)

	Age (years)
Mean	19.20
Std. Deviation	2.57
Range	10.00
Minimum	15.00
Maximum	25.00

Table 2: Frequency distribution of age groups

Age groups	Frequency	Percent
15-20	74	74.0
21-25	26	26.0
Total	100	100.0

Table 3: Frequency distribution of socioeconomic status

Economic status	Frequency	Percent
≤ 8000	52	52.0
> 8000	48	48.0
Total	100	100.0

Table 4: Frequency distribution of education status

Education status	Frequency	Percent
Illiterate	47	47.0
Matriculation	46	46.0
Higher education	7	7.0
Total	100	100.0

Table 5: Frequency distribution of education status

BMI	Frequency	Percent
≥ 30	8	8.0
< 30	92	92.0
Total	100	100.0

Table 6: Descriptive Statistics of Pain on VAS (baseline)

	Pain on VAS (baseline)
Mean	7.86
Std. Deviation	1.01
Range	5.00
Minimum	5.00
Maximum	10.00

Table 7: Descriptive Statistics of Pain on VAS (After 3 days of treatment)

	Pain on VAS (After)
Mean	4.03
Std. Deviation	1.43
Range	5.00
Minimum	2.00
Maximum	7.00

Table 8: Descriptive Statistics of Change in Pain on VAS

	Change in Pain on VAS
Mean	3.83
Std. Deviation	1.21
Range	5.00
Minimum	1.00
Maximum	6.00

Table 9: Comparison of Descriptive Statistics of Pain on VAS (Before and after 3 days of treatment)

	Pain on VAS (baseline)	Pain on VAS (After)
Mean	7.86	4.0300
Std. Deviation	1.01	1.43164
Range	5.00	5.00
Minimum	5.00	2.00
Maximum	10.00	7.00

Table 10: Comparison of change in pain score (before – after) in different age groups

	Age Groups	
	15-20 years	21-25 Years
<i>N</i>	74	26
<i>Mean</i>	3.85	3.77
<i>Std. Deviation</i>	1.24	1.14
<i>Std. Error Mean</i>	0.14	0.22

Table 11: Comparison of change in pain score (before – after) in different education level

	Education level in years	
	< 10 years	≥ 10 years
<i>N</i>	47	53
<i>Mean</i>	3.87	3.79
<i>Std. Error Mean</i>	0.18	0.16

Table 12: Comparison of change in pain score (before – after) in different economic level

	Economic level (Rs. Per month)	
	≤ 8000	> 8000
<i>N</i>	52	48
<i>Mean</i>	3.82	3.83
<i>Std. Deviation</i>	1.32	1.09
<i>Std. Error Mean</i>	0.18	0.15

Table 13: Comparison of change in pain score (before – after) in different bmi

	BMI	
	≥ 30	< 30
<i>N</i>	8	92
<i>Mean</i>	3.50	3.85
<i>Std. Deviation</i>	1.30	1.20
<i>Std. Error Mean</i>	0.46	0.13

DISCUSSION

Primary dysmenorrhea is painful menstrual cramps without any evident pathology to account for them, and it occurs in up to 50% of menstruating females and causes significant disruption in quality of life and absenteeism.⁸ The incidence of dysmenorrhea in this group maybe as high as 70%, with up to half of women experiencing loss of ability to perform daily activities.¹¹ The true overall incidence of dysmenorrhea is difficult to estimate, but most authors feel that between 50% and 90%¹² of women will suffer disability (ie, interruption of normal activity or function) at least once during their reproductive years.

In dealing with dysmenorrhea, medications such as prostaglandin synthesis inhibitors, nonsteroidal anti-inflammatory drugs and contraception pills are used irregularly because of fear of their side effects¹³. Some herbal products are effective on dysmenorrhea and its associated symptoms. Some plants are anti-spasmodic and some have a prostaglandin inhibitory effect. The mechanism of action of many herbal medicines is not completely understood⁷.

Medications used may include NSAIDs and opioid analgesics, as well as oral contraceptives (OCs). In addition to pain relief, mainstays of treatment include reassurance and education. Conventional management using anti-inflammatory drugs and analgesics is often an unsatisfactory answer due to side effects and/or patient-compliance issues¹⁴.

Hence as an alternative *Zingiber officinale* (*Z. officinale*), commonly known as ginger, has been widely used traditionally for a variety of medicinal purposes, one of which is for the treatment of pain.⁵ The anti-inflammatory properties of ginger have been known and valued for centuries¹⁰.

In another clinical trial was conducted at Toyserkan Azad University in western Iran from July 10 to September 5, 2010. It comprised of 70 female students of the university with primary dysmenorrhea. The subjects were randomly divided in to two equal groups and were given either placebo or ginger in capsule form for 3 days in first menstruation cycles. They graded the severity of their pain using a visual analogue scale. Compared with the baseline, the decrease in the visual analogue scores of post-therapy pain in the ginger group was significantly greater than that for placebo group. In the ginger group, 29 (82.85%) subjects reported an improvement in nausea symptoms, compared with 16 (47.05%) in the placebo group. It was also reported that mean pain score before using ginger was (7.08±1.02) and after usage the ginger was (4.81±1.70). These results were significantly different from placebo group which had (7.61±1.20) and (7.11±1.12), before mean pain and after mean pain respectively¹⁴.

In another study, One hundred and twenty-two female students with moderate to severe primary dysmenorrhea were randomly allocated to the ginger and mefenamic groups in a randomized clinical trial. The mefenamic group received 250 mg capsules every 8 h, and the ginger group received 250 mg capsules (*zintoma*) every 6 h from the onset of menstruation until pain relief lasted 2 cycles. The

intensity of pain was assessed by the visual analog scale. The pain intensity in the mefenamic and ginger group was 39.01 ± 17.77 and 43.49 ± 19.99 , respectively, in the first month, and 33.75 ± 17.71 and 38.19 ± 20.47 , respectively, in the second month ($p > 0.05$). The severity of dysmenorrhea, pain duration, cycle duration and bleeding volume was not significantly different between groups during the study. The menstrual days were more in the ginger group in the first ($p = 0.01$) and second cycle ($p = 0.04$). Repeated measurement showed a significant difference in pain intensity within the groups by time, but not between groups. Ginger is as effective as mefenamic acid on pain relief in primary dysmenorrhea. Ginger does not have adverse effects and is an alternative treatment for primary dysmenorrhea¹⁶.

In 2013 it was reported that Ginger is effective in minimizing the pain severity in primary dysmenorrhoea, they reported that Compared with the baseline, the decrease in the visual analogue scores of post-therapy pain in the ginger group was significantly greater than that for placebo group. In the ginger group, 29 (82.85%) subjects reported an improvement in nausea symptoms, compared with 16 (47.05%) in the placebo group¹⁴.

One more study reported that pain score of Ginger was 7.34 ± 1.1 ($n = 59$) before use and was 4.61 ± 2.55 ($n = 59$) after use, the change in pain score was 2.72 ± 2.82 ($n = 59$) while with placebo was 7.52 ± 0.93 ($n = 46$) before use and 6.01 ± 2.65 ($n = 46$) after use, with change of 1.51 ± 2.77 ($n = 46$) in females having primary dysmenorrhea⁶.

We in this found similar statistics in favor of Ginger i.e., pain related to primary dysmenorrhea before treatment was 7.86 ± 1.01 with minimum and maximum pain 5 and 10 respectively on VAS. After 3 days of treatment mean pain of primary dysmenorrhea was 4.03 ± 1.43 with minimum and maximum pain 2 and 7 respectively on VAS. Mean change in pain after treatment was 3.83 ± 1.21 on VAS. The mean change after treatment was significantly reduced p -value < 0.001 . The findings of this study are in agreement to above cited studies^{6,7,9,10,15}.

The additional benefits of this study are that we stratified our data and found that mean change in pain after treatment was 3.85 ± 1.24 in females 15-20 years of age while in females aged 21-25 years the mean change in pain after treatment was 3.77 ± 1.14 . There was no statistical significant difference in mean change in pain in both age groups, p -value = 0.769. Mean change in pain after treatment was also same in relation to their education status, p -value = 0.745, i.e. in females having education < 10 years mean change in pain was 3.87 ± 1.26 and in females having education ≥ 10 years mean change in pain was 3.79 ± 1.18 . On splitting data for socio economic status and BMI we found no statistical significant difference in mean change in pain after treatment, p -value > 0.05 .

Limitation of this study was we did not compare our Ginger study group with any other group, so local researchers in future should consider randomized trials.

CONCLUSION

Ginger is one of the herbal supplements that has been used for medical purposes since antiquity and is known as a popular herbal medication to treat painful diseases. Hence, through this study we found that Ginger is an effective treatment in significantly reducing pain severity in primary dysmenorrhea.

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