

Comparison of Effect of Fast and Slow Kegels Exercises in Reducing Pain in Primary Dysmenorrhea: Experimental Design

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Abstract

Objective: To determine the effects of slow kegels and fast kegels in the treatment of primary dysmenorrhea. Design-experimental design, comparative in nature. **Setting:** The study was conducted at mata gujri hostel, SBSPGI, dehradun, uttrakhand. **Population and Sample:** 550 female hostlers of mata gujri girls hostel, Sardar Bhagwan Singh Post Graduate Institute of Biomedical Sciences and Research, Balawala, Dehradun. 24 female subjects (mean age of 21.16 ± 1.2) of SBSPGI, Dehradun, Uttrakhand. **Methods:** Subjects were randomly divided into three groups, Group A - slow kegels (21.1 ± 99), Group B (20.7 ± 1.49) - fast kegels, Group C (21.5 ± 1.5) - control group. Subjects practiced the pelvic floor muscle exercises every alternate day till a period of 8 weeks. The treatment intervention was measured using two different variables i.e. visual analogue scale and Mentural distress questionnaire. data analysed by 1 way annova and krushkal wallis test. main outcome measure-independent various. **Result:** The mean results of before treatment and after treatment are significant. **Conclusion:** The group b fast kegels was found to be more effective after the treatment protocol of 8 weeks.

Keywords: Ddysmenorrhea; Pelvic floor muscle exercise; Fast and slow kegels.

Introduction

Dysmenorrhea is a painful syndrome that accompanies the menstrual cycles. Dysmenorrhea (or dysmenorrhoea) is a medical condition characterized by severe uterine pain during menstruation.[1]

The prevalence of dysmenorrhoea was lower at 24 years of age than at 19 years of age. At 24 years of age, 67% of the women still experienced dysmenorrhoea; 10% reported dysmenorrhoea which limited daily activity. The severity of dysmenorrhoea (linear analogue scale) was lower at 24 years of age than at 19 years.[2]

Dysmenorrhea can be classified into three

groups on the basis of pathophysiology- congestive Dysmenorrhea, spasmodic Dysmenorrhea, and membranous Dysmenorrhea. Spasmodic Dysmenorrhea- the majority of cases of dysmenorrheal fall into this group, and it is probable that nearly 50% of the adult female population suffer at sometime from varying degrees of these symptoms. The patient's history is very characteristic. The pain develops on the first day of the menstrual period, when excruciating lower abdominal pain is experienced which lasts for a relatively short time. This severe pain is intermittent n spasmodic.[3]

Menstruation is the result of marked vascular changes in endometrium in response to both estrogen and progesterone. The fibers those affected are tunica media of endometrial coiled arteries, as a consequence these artery constrict at first intermittently then after 2 days, for the several hours at a time, so that superficial endometrium undergoes ischaemia, that precedes the degeneration of stratum functionalis of endometrium, extravasation of blood into superficial stroma, and eventual sloughing of necrotic, blood soaked stroma

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that constitutes a typical menses.

Symptoms include: Typically, primary dysmenorrhea is characterized by a crampy suprapubic pain that begins somewhere between several hours before and a few hours after the onset of the menstrual bleeding. Symptoms peak with maximum blood flow²⁰ and usually last less than one day, but the pain may persist up to 2 to 3 days. Treatment for dysmenorrhoea aims to relieve pain or symptoms either by affecting the physiological mechanisms behind menstrual pain (such as prostaglandin production) or by relieving symptoms. Treatments such as paracetamol, aspirin, and NSAIDs work by reducing the activity of cyclo-oxygenase pathways, thus inhibiting prostaglandin production. Treatments such as oral contraceptives work by inhibiting ovulation.[4]

Exercise

Physical exercise may reduce dysmenorrhoea. Current studies have too many methodological flaws, however, to be able to confirm results. It is hypothesised that exercise works by improving blood flow at the pelvic level as well as stimulating the release of β endorphins, which act as non-specific analgesics.[1]

Heat therapy has been a traditional home remedy for dysmenorrhoea. One RCT has compared its use with the NSAID ibuprofen. The heat patch (39°C) used for 12 hours a day was found to be as effective as ibuprofen (400 mg three times a day) and more effective than placebo in reducing pain.[1,5,6]

During active exercise the capillaries in the working muscles dilate and their permeability increased. Many capillaries that are closed when the muscle was at rest become open and blood flows through them. In this way the capacity of the muscle to contain blood is markedly increased and the interchange of fuel and waste products between the blood and the tissue fluids is facilitated.[7]

The exercise will decrease duration and severity of dysmenorrhea and also using of sedative tablets in high school girls exercise is

known to cause the release of endorphins, substances produced by the brain that raise the pain threshold.[8]

Pelvic floor muscle ex

The pelvic floor muscles are likely to be weak at the end of the day when being sick and just before menstruation weak, easily fatigued, saggy muscles do not support pelvic organs and result in supportive dysfunction of pelvic floor muscles. Lengthened muscle may result in pain and pressure because structures hang on ligamentous supports and stretch the nerves.[9]

In addition, menstrual pain, with its distinctive cramping, tends to tense a woman's muscles, and that in turn can significantly restrict the muscles of the abdomen and pelvic floor.

Methods

Subjects: 24 female subjects after being assessed through inclusion and exclusion criteria and volunteered in the study. The subjects were aged between 19-25 years.

Study design: The design used in this study was an experimental design. The treatment intervention was measured using 2 separate variables. Visual analogue scale and Mental distress questionnaire measured pain and psychological symptoms along with pain.[10,11] These measurements were taken at the initial physical therapy evaluation (prior to initiation of training), following the measurements were taken at the end of menstruation i.e. 4 weeks followed by final reading at 8th week.

Instrumentation

Procedure-a detailed explanation was given to each subject regarding the aims of the study, techniques to be used, and the extent of their participation. All the subjects signed an institutionally approved consent form before participating in her study. A physical

therapy assessment were performed on all subjects prior to the initiation of treatment.

Physical therapy assessment

The evaluation included a questionnaire which was designed according to the inclusion and exclusion criteria.

Treatment protocol

The subjects were screened for primary dysmenorrhea so as to fulfill the inclusion criteria. After that the VAS score and menstrual distress questionnaire was measured at 0th week.[1,10,12,13]

Next random sampling of the subjects was done to divide them into 3 groups i.e. group A (n=8) group B (n=8) group C(n=8)with the mean age of respectively. Each subject was then treated according to her respective group. The exercise groups had the position of lying initially by putting a pillow under the buttocks for a month[14] i.e. till the end of 4th week and then progressing to sitting position[15] till 8th week.

In group A, prior to exercise hot pack for 15 minutes was given over lower abdomen then the slow kegels exercise was performed 90 contractions with the hold time of 5-10 sec. in three sets of 30 with 5 minutes break in between. The exercise was done on every alternate day. In group B, prior to exercise hot pack for 10 minutes was given over lower abdomen then the Fast kegels exercise was performed 90 contractions in three sets of 30 with 5 minutes break in between. The exercise was done on every alternate day.[14,15] In group C which is the control group, was given only the hot pack for 10 minutes. After therapeutic treatment was over, again visual analogue score and menstrual distress questionnaire was measured, in each group. The therapeutic treatment was continued till 8 weeks and VAS was measured at the end of 4th and 8th week.

Data analysis

Kruskal Wallis test has been performed to

compare mean values of menstrual distress questionnaire scores. AT 0th week,4th week ,8th week in between slow kegels group, fast kegels group and control group.

One way Anova test has been performed for comparing the improvement in Visual analogue scale score at 0th week,4th week ,8th week in between slow kegels group ,fast kegels group, and control group. Post hoc scheffe's test has been performed for comparing mean differences between

- 1) slow kegels Vs fast kegels,
- 2) fast kegels Vs control group,
- 3) slow kegels Vs control group.

Significance level has been selected as 0.05.

Results

A total number of 24 subjects with mean age (21.08±1.282) were taken and divided into three groups with 8 subjects in each, namely group A slow kegels (mean age 21±1.069),group B fast kegels (mean age 20.875±1.246) and group C control group (mean age 21.375±1.597).

Comparison between menstrual distress questionnaire scores in slow kegels fast kegels & control group at 0 week

Kruskal-Wallis test was performed to compare mean values of menstrual distress questionnaire scores. scores of slow kegel group at 0 week were 121±34.86, fast kegels group at 0 week were 95.12±14.81, control group at 0 week were 100.62±32.039.the results were non significant at 0 week,(p>.05).

Comparison between visual analogue scale in slow kegels, fast kegels & control at 0 week

One way anova was performed to compare the mean values of visual analogue scale scores of slow kegels group at 0 week were 7.03±0.72, fast kegels group at 0 week were 7.34±1.049, control group at 0 week were 6.86±1.63. The results were non significant at 0

Fig 1: Showing the initial position of relaxation with moist heat pack on lower abdomen



Table 1: comparison between menstrual distress questionnaire scores in slow kegels fast kegels & control group

| Group | Menstrual Distress Questionnaire(0 week) | |
|--------------|--|----------------------|
| | 4 TH WEEK | 8 TH WEEK |
| slow kegels | 104.66±28.319 | 70.25±16.455 |
| fast kegels | 69.125±20.559 | 60±9.102 |
| Control | 86.89±38.105 | 94.75±27.442 |
| H- Value | 4.37 | 10.3 |
| Significance | N.S. | S. |

N.S = Non Significant (p > 0.05);
S = Significant (p < 0.05)

week,(p>0.05).

Comparison between menstrual distress questionnaire scores in slow kegels, fast kegels and control group

Kruskal Wallis test was performed to compare mean values of menstrual distress questionnaire scores. The scores of slow kegels group at 4th week were 104.66±28.319, fast kegels group at 4th week were 69.125±20.559, control group at 4th week were 86.89±38.105. The results were non significant at 4th week ,(p>0.05) table 5.4. Kruskal wallis test was performed to compare mean values of menstrual distress questionnaire scores. The scores of slow kegels group at 8th week were 70.25±16.455, fast kegels group at 8th week were 60±9.102, control group at 8th week were 94.75±27.442. The results were significant at 8th week,(p<0.05).

Table 2: Comparison between Visual Analogue Scale scores in slow kegels fast kegels & control group

| Group | Visual Analogue Scale | |
|--------------|-----------------------|----------------------|
| | 4 TH WEEK | 8 TH WEEK |
| slow kegels | 5.20±1.33 | 3.95±2.32 |
| fast kegels | 3.975±2.182 | 2.87±1.532 |
| control | 5.33±2.46 | 6.2±1.62 |
| F-ratio | 1.37 | 6.95 |
| Significance | N.S. | S. |

N.S = Non Significant (p > 0.05);
S = Significant (p < 0.05)

Comparison between visual analogue scale in slow kegels, fast kegels and control group

One way Annova was performed to compare the mean values of visual analogue scale scores of slow kegels group at 4th week were 5.20±1.33, fast kegels group at 4th week were 3.975±2.182, control group at 4th week were 5.33±2.46. The results were non significant at 0 week,(p>0.05), table 5.5. One way Annova was performed to compare the mean values of visual analogue scale scores of slow kegels group at 8th week were 3.95±2.32, fast kegels group at 8th week were 2.87±1.532, control group at 8th week were 6.2±1.62. The results were significant at 0 week,(p<0.05).

Comparison between visual analogue scale in slow kegels, fast kegels & control group for post hoc test

Post hoc scheffe's test has been performed for comparing mean differences between 1) slow kegels Vs fast kegels, 2) fast kegels Vs control group, 3) slow kegels Vs control group.

The result shows insignificant difference (p>0.05) between slow kegels and fast kegels, significant difference (p<0.05)between fast kegels and control group, insignificant difference(p>0.05) between slow kegels and control group.

Discussion

This study compares effect of fast and slow kegel exercises in reducing pain in primary dysmenorrhea. The study design comprises of twenty four female subjects who were divided into three groups. Group A, slow kegel group performed slow kegel 90 contractions with hold of 5-10 seconds done in 3 sets of 30 with 5 minutes of rest in between preceding moist heat pack of 15 mins. Group B, fast kegel group performed fast kegel 90 contractions clench the muscles quickly and let go and done in 3 sets with 5 mins of rest in between preceding moist heat pack of 15 mins. Each given every alternate day in a 8 week protocol.

As the outcome variable is a questionnaire (MMDQ) and there is no interval in the score amongst different questions so it comes under ordinal level of measurement so test should be non-parametric as the subjects are unmatched and there are three groups, the Kruskal wallis test were used for data analysis. Data analysis using Kruskal wallis test revealed that there wasn't any significant difference in MDQ scores at 0 and 4th week but the difference was significant at 8th week.

Another outcome variable is VAS and there is a true zero in the scale so it comes under ratio level of measurement so test used should be parametric as the subjects are unmatched and there are three groups the test used for data analysis will be one way Anova and Scheffe's test. Data analysis using one way Anova test revealed that there wasn't any significant difference in VAS scores at 0 and 4th week but the difference in VAS scores at 8th week was significant as compared, data analysis of the final readings was compared by Scheffe's test that revealed that slow kegel Vs fast kegel was insignificant, fast kegel Vs control group was significant ($P > 0.05$), slow kegel and control group was insignificant ($P < 0.05$).

Primary dysmenorrhea is one of the most frequent of gynaecological complaints.[11] Menstrual pain, with its distinctive cramping, tends to tense a woman's muscles, and that in

turn can significantly restrict the muscles of the abdomen and pelvic floor.[16] Carrie m hall (1999) added the pelvic floor muscles are likely to be weak at the end of the day when being sick and just before menstruation. Weak, easily fatigued, saggy muscles do not support pelvic organs and result in supportive dysfunction of pelvic floor muscles. Altered tone of pelvic floor muscles can also occur in response to pain in lower pelvic organs.[9]

Data analysis revealed that the difference between the three groups was significant at second week. When the three groups were compared for extent of effectiveness of data revealed that fast kegel group was better than slow kegel group and hot pack group. Slow kegel are far better than hot kegel.

Certain training principles for large skeletal muscles can be applied to exercise programs for the pelvic muscles.[16] Fast kegel group recruit the fast twitch muscle fibers 30% which are type II fibers this group was more effective as it emphasizes specially on muscle strengthening. Colbey Kisner stated for type II fibers that speed of contraction is fast, rate of fatigue is fast, these muscle fiber provide mobility. These are characterized by fast contractile, response have a low myoglobin content and have a high glycolytic capacity, and are recruited for activities requiring power.[17] Michelle proctor stated Exercises are beneficial (in reducing spasm) because they increase morale and also restore flexibility and strength to musculoskeletal structures.[11] It is hypothesized that exercise works by improving blood flow at the pelvic level as well as stimulating the release of β endorphins, which act as non-specific analgesics.[4] Cornelia A. Griffin (1994) stated strength gain of 20%-40% may occur within the first two weeks of training with no measurable increase in muscle size. These early strength increases are believed to result from improved levels of motor activity, if the training is continued, subsequent additional strength gains are made through muscle hypertrophy. Fast kegel (type II fibers) speed of contraction is fast, recruited for activities requiring power and fiber seems to have

higher potential for muscle hypertrophy. Now exercises are beneficial (in residing pain), restore flexibility and strength to , musculoskeletal structures, more pumping of blood in hypertrophic muscle. Exercise work by improving blood flow at pelvic level, stimulating the release of beta endorphins, which act on non-specific analgesics. Hence, more effective than slow kegels and hot pack.

So, now it can be said that as fast kegels has a better strengthening component than slow kegels the results show fast kegels is more effective. Slow kegels did not concentrated specially on strengthening and moreover had a very less role in it. Slow kegels group recruit the slow twitch muscles fibers 70% which are type I fibers this group had even shown positive results but it is concentrated on as slow kegels is type I fibers. Cornelia A. Griffin (1994) stated that slow twitch fibers are fatigue resistant and better adapted to prolonged activity. These fibers have more mitochondria, more myoglobin, and more dense capillary networks than type II fibers. Carrie m hall (1999) stated that the pelvic floor muscles are likely to be weak at the end of the day when being sick and just before menstruation. Weak, easily fatigue, saggy muscles do not support pelvic organs and result in supportive dysfunction of pelvic floor muscles. She further stated the pelvic floor provides support to the normal pelvic organs. The normal organ pelvic organ support is achieved by ligamentus support from above and PFM from below.[9] The supportive function is primarily performed by the tonic, slow twitch muscle fibers. Hence working on slow twitch muscles will improve the supportive function of the pelvic floor and the weakness is improved.

Accrding to Meyer JM *et al* (2005) Hot packs have least effect as it is temporary relaxing or placebo effect. Hot pack is conjunction with exercises is more effective than hot pack alone.[6] Arthur I. Jacknowitz *et al* (2001) stated that it causes vasodilatation and increases local blood flow, it provides local analgesia.[18]

As the data analysis revealed that the difference between the three groups was

significant at 8th week and there was a decrease in vas scores over eight week time as revealed by comparison of individual mean values.

Slow kegels (type I fibers) speed of contraction is slow, recruited for activities demanding endurance.[16,17] These fibers are supplied by small neurons with the threshold of activation and are preferentially in low intensity exercise, these fibers have mitochondria, more myoglobin and more dense capillary networks when worked upon[16], the pelvic floor muscles are likely to be weak at the end of the day when being sick and just before menstruation that results in supportive dysfunction of pelvic floor muscles.[12] Supportive function is primarily performed by the tonic, slow twitch muscle fibers hence, weakness improved

Patients given with hot packs also experienced some improvement due to placebo effect or temporary relaxation effect of heat. Heat causes vasodilatation and increases local blood flow. It may provide local analgesia (possibly through counter irritation and an effect on gate-controlled pain), and hence short term relief of symptoms. Heat packs, placebo effect or heat causes vasodilatation and increases local blood flow which provides local analgesia,short term relief of symptoms.

As after the research it is seen that "There is significant difference in the effect of slow kegels and fast kegels in relieving symptoms in primary dysmenorrhea." The Experimental Hypothesis is accepted.

Conclusion

The result signifies fast kegels group is the effective than slow kegels group and hot pack control group in relieving pain in primary dysmenorrhea.

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