Efficacy of Traditional Kegels Versus Reverse Kegels on Vaginal Atrophy among Post Menopausal Women

Aakila Mohamadi¹, Vinodhkumar Ramalingam², Jeslin Godwin Nirmala³

¹Post Graduate Student, ²Professor, ³Tutor, Saveetha College of Physiotherapy, Saveetha Institute of Medical & Technical Sciences, Chennai, Tamil Nadu, India.

How to cite this article: Aakila Mohamadi, Vinodhkumar Ramalingam, Jeslin Godwin Nirmala. Efficacy of Traditional Kegels Versus Reverse Kegels on Vaginal Atrophy among Post Menopausal Women. Indian Journal of Physiotherapy and Occupational Therapy / Volume 18, Year 2024.

Abstract

Background: Menopause leads to a dramatic drop in ovarian function which lower the oestrogen in the circulating blood may cause atrophy of vaginal epithelium. Traditionally the atrophy of vaginal epithelium was managed by Kegels exercise but not attempted using reverse Kegels exercise.

Purpose: This present study attempted the reverse Kegels exercise and compares the effectiveness with traditional Kegels exercise on vaginal atrophy and vaginal pH among postmenopausal women.

Materials and Methods: 32 postmenopausal women in the age group between 40 to 60 years with vaginal atrophy were recruited and randomly assigned to one of the two groups: Traditional Kegels group (n=16) and Reverse Kegels group (n=16). The vulvovaginal symptom questionnaire (VSQ) and vaginal pH test kit were used as outcome measures to assess the vulvovaginal symptoms and vaginal pH level before and after the intervention.

Results: The t-test analysis was used to analyse the comparison within and between the groups. The p value of the Vulvovaginal symptom questionnaire in post-test values between the groups was 0.0256 (p value < 0.05) which was statistically significant.

Conclusion: Based on the outcome measures the participants in the traditional Kegels exercise found to be better in reliving the vulvovaginal symptoms. However, the vaginal pH level in both the groups after intervention does not show any changes.

Keywords: Genitourinary syndrome of menopause, pelvic floor muscle, Vulvovaginal atrophy, vaginal pH, Menopause, Reverse Kegels.

Introduction

Menopause is described as the termination of ovulation once a woman hasn’t had a menstrual period for 12 consecutive months, that typically happens in the fourth or fifth decade of life¹. During the post-menopausal period, reduction in ovarian function results in 95 percent decline in oestrogen production² that alters the function of genitourinary tract accompanied with vulvovaginal atrophy which was found to be prevalent approximately in half of postmenopausal women³⁷.

In vaginal atrophy (VA), the epithelium of vagina gets atrophied and dries out, resulting in reduced vaginal lubrication⁸ and it is a common
condition yet frequently ignored, especially among postmenopausal women\textsuperscript{2}. VA is now categorised with atrophic vaginitis, urogenital and vulvovaginal atrophy under the new phrase genitourinary syndrome of menopause (GSM)\textsuperscript{9}.

A study by Palma et al., in 2016 has concluded that out of 913 females, 722 participants have been confirmed with GSM, with the prevalence rate varying from 64.7\% to 84.2\%, from 1 to 6 years after menopause\textsuperscript{10}.

In another study, 15\% of female’s report VA symptoms prior to menopause, while 40 to 57 percent develop symptoms in their postmenopausal period\textsuperscript{2}.

Further, the menopause influences the pH level of vagina, as the oestrogen level decreases the vaginal pH level increases. Lactobacillus in the vaginal region produces lactic acid which in turn makes the vaginal pH acidic to maintain the vaginal health and this mechanism alters after menopause as it occurs in response to oestrogen\textsuperscript{11}.

Optimal vaginal pH level is ≤ 4.5 during the reproductive years, whereas it is >4.5 before menarche and in postmenopausal in absence of vaginal infections\textsuperscript{12}. Elevation in the vaginal pH level makes the vagina more prone to infections and aggravates the vaginal symptoms related with VA\textsuperscript{13}. Vaginal pH >5 has indeed been reported in certain research as a particular perspective to diagnose menopause with specificity of 64-67\%\textsuperscript{8}.

The atrophy of vaginal epithelium could be managed by pelvic floor muscle training (PFMT) that involves contraction of pelvic floor muscles and it is proved to be an effective management strategy to reduce the symptoms of VA among postmenopausal women in a study conducted by J. Mercier et al., at 2019 that suggests that PFMT improves blood flow in vulvovaginal atrophy\textsuperscript{14}. But to the best of our knowledge no study has addressed the effect of reverse Kegels exercise on VA and the impact of exercise on vaginal pH level.

Kegels exercises are the most common technique of strengthening the pelvic floor muscles, originally described by Arnold Kegel, an American gynaecologist in 1948. A non-invasive treatment that does not require the use of vaginal weights or cones and the most cost-effective treatment which differ from other therapies in that patients can do them anytime, anyplace, while doing other work, and without having to visit the hospital on a regular basis. Patients must simply be taught how to tense their pelvic floor muscles\textsuperscript{15}.

A reverse Kegel is a simple stretching exercise that assists in pelvic floor relaxation. It reduces pelvic pain and tension while also increasing flexibility. Traditional Kegels are a type of exercise that focuses on contracting and releasing the pelvic region and the absolute opposite of reverse Kegels. The goal of reverse Kegels is to release and relax the pelvic floor muscles.

Approximately 70\% of women are often hesitant or ashamed to report their problems or seek therapy for them as they think it’s natural and part of the aging process and the majority are even unaware of therapeutic options. Cultural, religious, and societal beliefs must also be considered. The signs and symptoms of vaginal atrophy are similar to those of many other genitourinary disorders which lead to under diagnosis as well as under treatment of the condition\textsuperscript{7,8}.

There is a lack of awareness among the postmenopausal women about the genitourinary syndrome - vaginal atrophy especially among Indian women. Studies with the usage of reverse Kegels exercises on vaginal atrophy among the menopausal women are yet to be explored further. However, to the best of our knowledge, no study has compared the effect of Traditional Kegels with Reverse Kegels on vaginal atrophy and vaginal pH among postmenopausal women. The alternate hypothesis of this study states that there is a significant difference between Traditional Kegels and Reverse Kegels on vaginal atrophy among postmenopausal women.

**Aim**

This present study attempted the reverse Kegels exercise and compares the effectiveness with traditional Kegels exercise on vaginal atrophy and vaginal pH among postmenopausal women.
Materials and Methods

A total of 48 postmenopausal women were referred from the Department of Obstetrics and Gynaecology to the Department of physiotherapy at a private hospital from August 2022 to January 2023.

Inclusion criteria:
- Subjects within the age group of 40 to 60 years
- Subjects who attained menopause either naturally or by surgically induced
- Subjects diagnosed with vaginal atrophy
- Subjects with an elevated vaginal pH level (4.6-7)

Exclusion criteria:
- Subjects with any active vaginal infections
- Subjects with UTI
- Subjects under hormonal therapy
- Subjects using topical oestrogen
- Subjects taking any medications for vaginal atrophy

Outcome Measures
- Vulvovaginal questionnaire
- Vaginal pH level

Procedure

Based on the inclusion and exclusion criteria, 32 subjects were recruited out of 48 in which 28 subjects attained the menopause naturally and 4 subjects had history of hysterectomy. Prior to initiation of procedure after thorough explanation of the study proceedings, an informed consent was obtained from all the subjects. Regular clinical history which includes questions like age, history of amenorrhea, previous surgical history was obtained. The subjects included in this study were blinded and randomly allocated into two experimental groups (group A and B) using a sealed envelope method. Group A (n=16) - received the Traditional Kegel exercises and Group B (n=16) - received the Reverse Kegel exercises. For the pre-test measures the Vulvovaginal Symptom Questionnaire (VSQ), vaginal pH test kit was used to analyse the vulvovaginal symptoms, vaginal pH level and the same was measured after 8 weeks of treatment as post-test values.

The VSQ is a reliable and internal consistent questionnaire, developed to evaluate the quality of life impacts of vulvovaginal symptoms among postmenopausal women. It is a written questionnaire which comprises 21 items and has 4 scales: symptoms, emotions, life and sexuality impact\(^\text{16}\). To assess the vaginal pH level, the subjects were placed in crook lying position and the vaginal swabs were collected using sterile gloves and evaluated immediately with the vaginal pH test strips\(^\text{13}\) and it was assessed by an Obstetrician at the Outpatient Department of physiotherapy at a private hospital in Chennai.

The subjects in both the groups were placed in crook lying position and instructed to identify their pelvic floor muscle which stops or slows the urination. Once identified, the subjects in group A who received traditional Kegels exercise were asked to contract the muscles and hold the contractions for up to 24 seconds and relax for about 3 to 6 seconds without holding the breath. They were given 3 sets of 10 contractions per session, twice a day. Holding the contractions progressed from 3 seconds in week 1 up to 24 seconds in week 8.

The subjects in group B who received reverse Kegels exercise were instructed to stretch the pelvic floor muscles as much as possible for up to 24 seconds a cycle. They were given 3 sets of 10 cycles per session twice a day. Stretching the PFM progressed from 3 seconds in week 1 up to 24 seconds in week 8.

The first week of this study period is the familiarization phase. During this phase, the subjects in both the groups performed the exercises only under the supervision of the therapist. After the familiarization- the follow up was done through the phone call until the completion of the study duration.

Figure 1: Participant from the study performing exercise to sign
Data Analysis

In this study, SPSS version 27.0 was used for statistical analysis. Normality was assessed using the Shapiro-Wilk test. The variable vulvovaginal symptom questionnaire and vaginal pH was found to be normally distributed. For statistical analysis, Independent t test and paired t test was used for both the variables. The significant results were confirmed if \( p < 0.05 \).

Results

As stated in table 1, group A consists of 16 participants with mean age and postmenopausal period in years of 51 ± 6.26 and 2.81 ± 1.33 respectively. Group B consists of 16 participants with mean age and postmenopausal period in years of 51.13 ± 5.9 and 2.88 ± 1.5 respectively. The baseline variables (age and post-menopausal period) were assessed for normality using Shapiro-Wilk test and were found to be normally distributed. Paired t test was used to analyze the differences in the baseline variables between the groups. The \( p \) value for age was 0.954 and for post-menopausal period was 0.902 indicating that the baseline variables had statistically no difference between the groups (\( p > 0.05 \)).

In this study, Table 2 shows the mean and standard deviation (SD) values of both the experimental groups (group A and group B) for vulvovaginal symptom questionnaire and vaginal pH level. The severity of vulvo vaginal symptoms were assessed using a Vulvovaginal symptom questionnaire that had a mean value of 12 ± 3.7 at the baseline and 7.5 ± 3 post intervention for group A and was 12 ± 3.9 at the baseline and 10.5 ± 4.2 post intervention for group B.

The vaginal pH level as assessed with vaginal pH test kit had a mean value of 6 ± 0.86 at the baseline and 6 ± 0.86 post intervention in group A, and was 6 ± 0.74 at the baseline and 6 ± 0.83 post intervention in group B which is stated in table 2. After the completion of the intervention, the mean and SD values of the vulvo vaginal symptom questionnaire for group A was 7.5 ± 3 and for group B was 10.6 ± 4.2. The mean ± SD values of vaginal pH level for group A was 6 ± 0.86 and for group B was 6 ± 0.83.

The \( p \) values of the vulvo vaginal symptom questionnaire was 0.026, for the vaginal pH level was 0.967 and thereby indicating the statistically significant difference between the groups as \( p < 0.05 \) for only one variable. This indicates that severity of vulvovaginal symptoms was much reduced in group A than group B. But there is no difference in the vaginal pH level in both the groups. The differences in the mean ± SD of the variables indicated that the participants who received traditional Kegels exercise (group A) were highly benefitted than those who received reverse Kegels exercise (group B).
Discussion

The current study was aimed to test the impact of the 8 weeks’ application of Traditional Kegels and Reverse Kegels in vaginal atrophy and vaginal pH among the postmenopausal women. The participants in group A Received Traditional Kegels exercise and group B received Reverse Kegels exercise. The severity of vulvovaginal symptoms as measured using Vulvovaginal symptom questionnaire (VSQ) was found to be reduced in group A with mean ± SD at post intervention was 7.5 ± 3 when compared with group B mean ± SD at post intervention was 10.5 ± 4.2 which indicates participants who received traditional Kegels exercise were responded well compared with reverse Kegels exercise.

Table 1: Baseline characteristics of subjects in both groups

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>AGE (IN YEARS)</th>
<th>POST MENOPAUSAL PERIOD (IN YEARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A (n=16)</td>
<td>51 ± 6.26</td>
<td>2.81 ± 1.33</td>
</tr>
<tr>
<td>GROUP B (n=16)</td>
<td>51.13 ± 5.9</td>
<td>2.88 ± 1.5</td>
</tr>
<tr>
<td>p VALUE</td>
<td>0.954NS</td>
<td>0.902NS</td>
</tr>
</tbody>
</table>

NS=p> 0.05 = Non significant

Table 2: Analyses of differences between the groups for outcome measures

<table>
<thead>
<tr>
<th>STATISTICAL ANALYSIS</th>
<th>GROUP</th>
<th>MEAN ± SD</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PRE TEST VALUES</td>
<td>POST TEST VALUES</td>
</tr>
<tr>
<td>VSQ</td>
<td>GROUP A</td>
<td>12 ± 3.7</td>
<td>7.5 ± 3</td>
</tr>
<tr>
<td></td>
<td>GROUP B</td>
<td>12 ± 3.9</td>
<td>10.6 ± 4.2</td>
</tr>
<tr>
<td>VAGINAL pH LEVEL</td>
<td>GROUP A</td>
<td>6 ± 0.86</td>
<td>6 ± 0.86</td>
</tr>
<tr>
<td></td>
<td>GROUP B</td>
<td>6 ± 0.74</td>
<td>6 ± 0.83</td>
</tr>
</tbody>
</table>

*=statistically significant, NS= Non significant

This data shows that the subjects in both the groups have shown a significant difference in their outcome measures. Compared to reverse Kegels exercise, traditional Kegels were much more effective in reducing vulvo vaginal symptoms as the PFM was contracted which results in increased blood flow in PFM unlike the reverse Kegels which only relaxed the PFM and also increased the intra-abdominal pressure. From this study, the traditional Kegels exercise has been proved to be effective in decreasing vulvovaginal symptoms as researchers suggest that PFMT improves the blood supply in the vulvovaginal tissues. It is well known that exercises of skeletal muscle contribute to an increase in the number of capillaries in the target muscles. The arteries which supply PFM also supply the vulvovaginal tissues, so the PFM training improves vulvovaginal blood flow and it leads to a better tissue quality as well as vaginal lubrication.

Due to various factors, the orientation strength of the pelvic floor decreases with ageing. This might pave the way for postmenopausal women to experience pelvic floor weakness.

A hypothesis was introduced by J. Mercier et al., in 2020 who conducted a study to determine the potential means of action for the enhanced GSM symptoms and indications in post-menopausal women with urinary incontinence after the completion of a 12 week PFMT program. The mean values of the vaginal atrophy index pre and post intervention were 9.93 ± 44 and 11.14 ± 1.48. The p value is < 0.001.
which is statistically significant. He has concluded that PFMT improves the signs and symptoms of GSM by improving the blood flow in the arteries supplying the vulvo vaginal tissues.

A similar hypothesis was introduced by the same author in 2016 who conducted a case study which aimed to find the efficacy of PFMT in reducing signs and symptoms of vulvovaginal atrophy has stated that 12 weeks of PFMT which involves contraction of PFM reduces vaginal dryness and dyspareunia symptoms. But in this current study we have found a similar effect in the participants in group A who received 8 weeks of traditional Kegels exercise which also involves the PFM contraction. An another single-arm feasibility study was conducted by the same author in 2019 involving 30 postmenopausal women with GSM who were treated with PFMT program also supports our study and has revealed that PFMT is the most beneficial and an effective managing strategy for postmenopausal women with GSM and urinary incontinence.

There is a lack in research articles to support the effect of reverse Kegels exercise on VA among postmenopausal women. The subjects in the reverse Kegels group also showed an improvement but comparatively less than the traditional Kegels group. The vaginal pH level as measured using vaginal pH test strips with mean ± SD at baseline and post intervention was 6 ± 0.8 in both the groups. This indicates that there was no statistical difference in the vaginal pH level in both the groups even after the intervention which suggests that both the exercises do not have any impact on the vaginal pH level.

The participants in both the groups have shown improvement in vaginal atrophy but the group which involved the administration of Traditional Kegels exercise has shown statistically significant improvement while comparing with the group that involved the administration of Reverse Kegels exercise but there is no significant difference in vaginal pH level in both the groups.

In this study, both the therapist and the assessor were not blinded. Further studies can be done in subjects during their pre and peri menopausal period with larger sample size and extended period of follow up, to evaluate the effect of Reverse Kegels exercises on men along with its comparison with other interventions.

**Conclusion**

Based on the outcome measures the participants in the traditional Kegels exercise group found to be better in reliving the vulvovaginal symptoms than the reverse Kegels group. However, the vaginal pH level in both the groups after intervention does not show any changes. Though the reverse Kegels exercise relieves the vulvovaginal symptoms of the postmenopausal women, the traditional Kegels exercise found to have better effect.

**ISRB Approval:** ISRB clearance was taken before recruiting the participants.

**ISRB number:** 01/ 050/ 2022/ ISRB/ PGSR/ SCPT

**Funding:** Self

**Conflict of Interest:** Nil

**References**


