

Original Article

To compare the effectiveness of taping technique and hydrotherapy in treatment of primary dysmenorrhea

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doi: 10.29052/IJEHSR.v6.i3.2018.34-42

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Received 15/04/2018

Accepted 25/08/2018

Published 01/09/2018



Abstract

Background: Dysmenorrhea is one of the common complaints in women. Globally, the reported prevalence rate is 90%. Sometimes the pain intensity is so severe that it may depict labour contractions. Hence, it greatly affects the productivity of women and causes socioeconomic lose. To subside such pain, over the counter medications are widely used, regardless of its systemic side effects. This study was conducted to estimate the extent to which women are affected with dysmenorrhea and to compare the effectiveness of Taping and Hydrotherapy for the treatment of primary dysmenorrhea.

Methodology: A survey-based quasi experimental single blinded, two- stage study with pre-test and post-test design was conducted. Fifty menstruating women suffering from primary dysmenorrhea of grade 2 or 3 between the age group of 15 to 25 years were recruited and divided into two groups with 25 females in each group. Females with any severe co-morbidity, abdominal surgery within past 2 years, intrauterine contraceptive devices, any skin lesions (scar, cyst or erosions) or who have recently conceived were excluded from the study sample. Females in taping group received treatment 2 days prior to menstruation which then continued till the first day of cycle. The hydrotherapy group was treated with 30 minutes session for 2 days a week, during non-menstruating phase. Data was collected using a Menstrual Symptom Questionnaire (MSQ) and Verbal Multidimensional Scoring System (VMSS) to estimate the frequency of dysmenorrhea, specifically primary dysmenorrhea in our society. To assess the effectiveness of the intervention, Short-form McGill Pain Questionnaire (SF-MPQ) was completed before and after the intervention. The collected data was analyzed using SPSS ver. 22.0.

Results: The survey revealed 92.4% of women were suffering from dysmenorrhea out of which 64% were primary dysmenorrheic. A significant decline was observed in Pain Rating Index (PRI) before and after intervention i.e. the mean PRI prior to the intervention was 29.53 ± 2.53 for the taping group and 29.4 ± 3.18 for the hydrotherapy group while after intervention it decreased up to 4.33 ± 0.61 in taping and 4.26 ± 0.7 in hydrotherapy group. Whereas, the Visual Analogue Scale (VAS) means before intervention were 8.53 ± 1.06 and 8.73 ± 1.03 for taping and hydrotherapy group respectively. Which then decreased to 3.93 ± 1.03 and 5.2 ± 1.52 for the two groups. The mean Present Pain Intensity (PPI) scores were 4.33 ± 0.61 in taping and 4.26 ± 0.7 in hydrotherapy group and reduced to 1.66 ± 0.81 and 2.26 ± 1.57 .

Conclusion: The study findings proclaimed that taping technique was found more effective in decreasing the painful cramps in women with primary dysmenorrhea as compared to the hydrotherapy.

Keywords

Asymmetrical Pelvis, Lower Extremity Pain, Directional Asymmetry, Absolute Asymmetry.



Introduction

The monthly distress faced by most of the women of reproductive age is dysmenorrhea i.e. painful menstruation¹⁻¹³. It is sometimes considered as bad as renal colic pain¹, labour like pain¹⁴⁻¹⁶, or acute ectopic pregnancy pain¹⁴. Globally the reported prevalence rate in adolescents is as high as 90%^{2,3,8,14,17-21}, out of which up to 15% depicts their torment as extreme and upsetting^{1,2,4,7,17&20}. Even though dysmenorrhea has all the earmarks of being the most widely recognized gynecological issue in ladies independent of nationality and age^{1,5&22}, it is inadequately addressed and is accepted as normal routine^{1,10&18}.

On the basis of pathophysiology, dysmenorrhea is subdivided into primary and secondary^{1, 2, 4, 10, 14, 17&23}. Primary dysmenorrhea is mostly reported after 6 to 24 months of menstrual onset^{1,3&7}. It is characterized as difficult, fitful cramping in the lower stomach area^{1,2,4,11,14,21,24&25} with a knowable sequential pattern starting just prior to and amid feminine cycle^{1,3,7,9,11&21}. The pain typically goes on for 8 hours to 3 days and is felt mostly extreme in the middle of the first or second day of the monthly cycle which may emanate to the lower back and thighs^{1,3,7,11,18,24&25}. It is mediated by prostaglandins and leukotrienes which produce spasms^{1-5, 7, 8, 10, 11, 13, 17, 22-26}. In specific, the prostaglandin F2 alpha and cyclooxygenase, metabolite of arachidonic acid causes severe vasoconstriction and myometrial contraction, which results in uterine ischemia and pain⁴. While pain due to secondary dysmenorrhea may commence from various pathological conditions including endometriosis, fibroids, pelvic inflammatory disease, use of an intrauterine contraceptives and/or adenomyosis^{1, 4, 5, 17, 26&23}.

Dysmenorrhea features negative effect on the health related quality of life, social aspects, intellect, moods, concentration, sleep and sports activities of numerous female teenagers^{1, 14, 18, 23&26}. It is also reported to be the primary cause of absenteeism from work and school^{1, 14, 18, 23&26}. In studies including dysmenorrheic women, the rate of absenteeism and social withdrawal was observed up to 50%^{1, 3, 7, 20, 23, 24, 25&31}. These results revealed that dysmenorrhea has tremendous impact on educational outcomes and productivity of women at workplaces^{2, 3, 8, 11, 12, 14, 17, 25&27}. It is also evident from Pakistani studies that due to severe cramps young ladies come up short to perform their everyday activities in the midst of the monthly cycle¹⁸. Moreover, due to social reasons females do not look for legitimate therapeutic considerations and exceedingly use non prescribed drugs¹⁸. In some of the other investigations that were led in diverse populaces, almost 70% of the young ladies were found to be self-medicating with over-the-counter painkillers to subside their menstrual cramps^{1, 4, 7, 14&17}.

Diverse proposed treatment strategies for dysmenorrhea incorporate needle therapy, skin electrical incitement, surgery, heat pads, and medicines including different vitamins and minerals^{1,4,5,7-9,11&16}. Prostaglandin inhibitors are found to be compelling in the treatment of dysmenorrhea^{1, 3-5,7,8&10}. The use of these drugs often causes systemic side effects such as sickness, digestive dysfunction, loose bowels, renal dysfunction, hepatotoxicity, edema, bronchospasm and in some cases weariness^{7, 8, 12, 14&17}. Furthermore, the utilization of these drugs is prohibited for the patients with peptic ulcer, or aspirin-sensitive asthmatics^{5,8&12}. Subsequently the leading known non-pharmacological strategy

i.e. physiotherapy is preferred^{8,9&19}. Recently, the use of special non-drug taping method known as kinesio taping has been picking up acclamation in the field of physiotherapy^{9&15}. It generates tactile stimulation on the skin that can block the entry of pain sensations to the brain⁹. In addition to this, kinesio taping unloads muscles and gives support to inner organs and sacroiliac joint^{20,22,24&26} and maximizes body's common recuperating capacity by improving blood circulation and lymphatic drainage^{15&24}.

Exercise is found to be beneficial for the management of pain^{8&25}. When these exercises are performed under buoyancy, as in hydrotherapy, it gives additional benefits^{8,27&28} i.e. it can be effective in reducing pain through empowering muscles and by decreasing pressure on the joints^{27, 28&29}. Moreover, it helps in minimizing the load on cardiovascular system through hydrostatic pressure and exerts pressure on the lower appendages when submerged in water up to neck that in turn facilitates the venous return^{8&29}. As the high prevalence and loss of productivity were surmised as a result of primary dysmenorrhea, therefore, to make better choice between safer treatment alternatives, the study endeavoured to ascertain the efficacy of taping technique compared to hydrotherapy in primary dysmenorrhea.

Methodology

This was a pre-test post-test quasi experimental single blinded two stage study. One of the study was to survey the approximate percentage of dysmenorrhea (mainly primary dysmenorrhea) in general population of menstruating women which was evaluated using a structured questionnaire, MSQ³⁰ and VMS³¹. In the

second stage of the study, the effectiveness of hydrotherapy and taping therapy for the treatment of primary dysmenorrhea were compared. Based on the evaluation of MSQ and VMS scores, about 50 female participants were recruited. The unmarried menstruating women of age 15-25 year, reporting the primary dysmenorrhea of grade 2 or 3 were included in the study. Whereas, the subjects with any severe co-morbidity, conception, abdominal surgery within past 2 years, intrauterine contraceptive devices or any skin lesion (scar, cyst or erosions) were excluded. Conditions like conception during study, drowning, burn, open wound, fractures, allergic reaction or heavy menstrual flow were considered as end points. In accordance to the Helsinki declaration, an informed consent was taken from all the participants and then they were allocated to two separate groups, hydrotherapy and taping with 25 subjects in each group.

Before the application of technique (pre-intervention), scoring of dysmenorrheal symptoms was done. Although it was a subjective finding, but objectively as much as possible, measurement of severity of dysmenorrhea was done by using the Short-form McGill Pain Questionnaire, which is a precise and valid tool with $r=0.8$ as calculated by Valiani in 2009^{8&12}. It consists of 15 pain rating questions in addition to VAS and PPI. The group allocated to taping technique was trained to apply taping which they intervened from approximately 2 days prior to their menstruation date to their first day of cycle. Three bandages of a special elastic and hypoallergenic tape was applied to thoracic dermatomal level T11 and T12. One 12 cm long tape was applied vertically between the belly-button and the symphysis pubis while the other with the same length

was applied horizontally (perpendicular to the previous tape). Posteriorly, the third tape of 20 cm length was applied horizontally covering both posterior-superior iliac spines. On the second menstrual day, subjects were asked to score their pain on SF-MPQ again. This technique was applied for two consecutive months.

While the subjects for hydrotherapy took 30 min session 2 days a week prior to their menstruation phase. The aquatic exercises included 5 minutes warm-up in the form of walking in water. Then for 20 minutes, aerobic and strengthening exercises of pelvis, abdominal and thigh muscles were done which helped modifying blood stasis in pelvic veins and facilitated quicker blood

circulation. At the end of session, subjects underwent cooling down for 5 minutes. Subjects then scored on SF-MPQ on their second menstrual day. These sessions were also continued for 2 months. To assess the effectiveness of both the treatments and to look for the better treatment option for the primary dysmenorrhea, the mean changes in the pain score were calculated and analyzed for each group using independent sample T-test on SPSS ver. 22.0.

Results

A total of 270 females were enrolled in the study but out of them only 250 completed and returned the questionnaires, yielding a response of 92.5%.

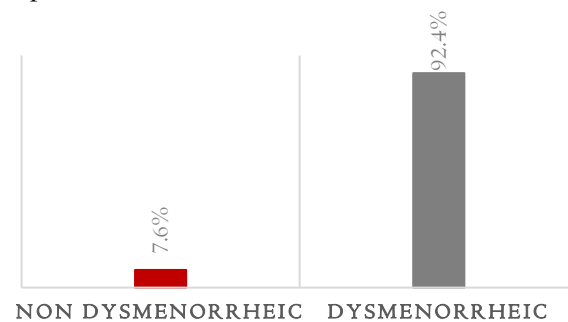


Figure 1: Prevalence rate of dysmenorrhea MSQ

Results in figure 1 shows that 92.4% of the females were dysmenorrheic while only 7.6% were non dysmenorrheic.

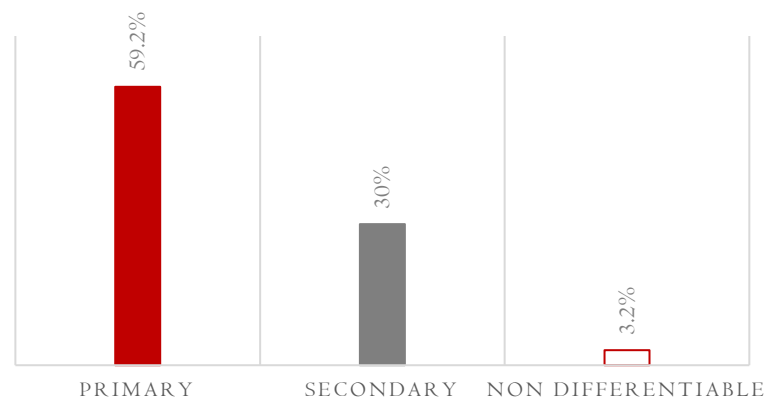


Figure 2: Distribution of Dysmenorrhea into Primary and Secondary

Out of 92.4%, 59.2% cases of dysmenorrhea were primary, 30% were experiencing pain due to secondary dysmenorrhea and 3.2% of the females gave non differentiable results as shown in figure 2.

Table I shows the mean pain scores in the two groups before intervention. There were no significant differences in the general characteristics of participants and their monthly cycle. PRI (taping: 29.53 ± 0.133 ; hydrotherapy: 29.40 ± 0.133) and PPI (taping: 4.33 ± 0.06 ; hydrotherapy: 4.26 ± 0.06). Hence, prior to the intervention both the groups were equal at base line.

Table I: Mean pain score differences reported prior to the intervention

Pre Intervention		Mean	Std. Deviation	Mean Difference	P-Value
Pain Rating Index	Taping	29.533	0.1333	2.53170	0.8704
	Hydrotherapy	29.400	0.1333	3.18029	
Visual Analogue Scale	Taping	8.533	-0.2000	1.06009	0.5025
	Hydrotherapy	8.733	-0.2000	1.03279	
Present Pain Intensity	Taping	4.333	0.0666	0.61721	0.7233
	Hydrotherapy	4.266	0.0666	0.70373	

*Significant at $P < 0.05$

Table 2 shows the differences in the mean pain scores after intervention. The significant differences at P -Value < 0.05 in PRI (taping: 12.6 ± 2.19 ; hydrotherapy: 19.8 ± 2.14) and VAS (taping: 3.9 ± 1.03 ; hydrotherapy: 5.2 ± 1.52) were observed. While the scores of PPI (taping: 1.6 ± 1.64 ; hydrotherapy: 2.2 ± 1.57) were found to be insignificant.

Table 2: Mean pain scores of subjects post-intervention

Post Intervention		Mean	Std. Deviation	Mean Difference	P-Value
Pain Rating Index	Taping	12.666	-7.1333	2.19306	0.0001*
	Hydrotherapy	19.800	-7.1333	2.14476	
Visual Analogue Scale	Taping	3.933	-1.2666	1.03279	0.0012*
	Hydrotherapy	5.200	-1.2666	1.52127	
Present Pain Intensity	Taping	1.666	-0.6000	1.64444	0.1945
	Hydrotherapy	2.266	-0.6000	1.57963	

*Significant at $P < 0.05$

Discussion

In women with ovulatory cycles, dysmenorrhea is an imperative clutter^{1-13,17-19}. This is caused by the accumulation of different metabolites which eventually raises the tension within the ligaments and nerves interfacing sacral vertebrae and uterus²⁰. Among the study population, the overall prevalence of dysmenorrhea was

found to be 92.4% (Figure 1). The previous studies favouring the results by Iacovides, Proctor and Cakir have reported the prevalence of dysmenorrhea as high as up to 95%^{1,5&10}. Moreover the globally reported prevalence of dysmenorrhea according to the studies conducted by Ju, Omidvar and Kim was upto 90%^{2,3,20&24}. In Asian countries like India, Bangladesh and Pakistan etc, the prevalence of

dysmenorrhea ranges up to 85%^{6&18}. Contrary, Dawood and Gebeyehu reported prevalence of 50%^{7&14}. Whereas, the work done by Alonso and Díaz Alcalá accounts dysmenorrhea as 60% prevalent^{13&16}.

In this study, the positive effect of taping and hydrotherapy in primary dysmenorrhea was also observed (Table 2) which was in line with the results of previous studies, Choi showed that taping technique as compared to hot packs when used in primary dysmenorrhea reduced pain in a statistically significant manner¹⁵; similar results were seen when Yum compared taping with painkiller medications²⁴. Studies done by Forozeshfard, Díaz Alcalá and Tomas-Rodriguez reported in favour of taping when compared to controlled group^{9,16&26}. In contrast Susila and Rezvani showed significant results in favour of hydrotherapy in relieving symptoms associated with primary dymenorrhea^{8&27}.

According to the SF-Mc gill pain questionnaire used in the study, there was a decrease of 16.8 points in PRI, 4.6 points in VAS and 2.6 points in PPI mean scores after taping was applied. The study by Yum KS, where VAS scale was only used showed a decrease of 6.8 points in the mean pain scores after applying the taping²⁴. The study done by Díaz Alcalá where again VAS was used to measure the taping effects in primary dysmenorrhea showed a decrease of 2.16 points¹⁶. The significance of hydrotherapy in primary dysmenorrhea was surmised with a decrease of 9.6 points in PRI, 3.5 points in VAS and 2 points in PPI mean scores (Table 2). While the results concluded from the study of Rezvani S showed a decrease of 2.03 points in VAS and 1.9 points in PPI after indulging in

hydrotherapy, whereas the PRI scores were not considered⁸.

This study for the first time highlighted the assessment of Primary dysmenorrhea in Pakistan via taping and hydrotherapy. The two treatments were compared to look for the better non-pharmacological treatment option for primary dysmenorrhea, which cannot be found in earlier studies. Moreover, this study involved a diversified sample with a larger window of inclusion criteria; hence the results can be used to make conclusions about a much broader population.

The main limitation of our study was the risk of selection bias; as the subjects were recruited on the basis of convenience and feasibility. Furthermore, the extent of pain experienced with menstruation was self-reported, that can affect the reliability. Pain is a subjective issue that changes with subject to subject according to their pain threshold. Therefore, pain discernment can be influenced by a variety of variables including culture, finance, and the ways of living. The few important factors like obesity, stress and fasting that might influence menstruation associated pain were not considered. Lastly, the time duration of the study was inadequate to a certain extent.

As a result, the present study indicates that taping technique is more effective in decreasing the severity of symptoms of primary dysmenorrhea as compared to the hydrotherapy. However the pain relieving effects of taping technique lasts for the short period of time while hydrotherapy effects persists for a longer duration.

Conclusion

In spite of the fact that this study has its own limitations, it gives valuable data that may be utilized by analysts or clinicians. Overall, the finding recommends that hydrotherapy in patients with primary dysmenorrhea can decrease pain but Kinesio taping procedure is more compelling non pharmacological treatment, which is easy, comfortable and self-applicable. However general health measures like hygiene should be assured. Nevertheless, we must take into consideration that the taping impacts were transitory and lasts for approximately 24 to 48 hours and were totally invalidated before the next treatment session. Whereas, pain relieving effects of hydrotherapy progressed with each session and may be in case, if the study would have proceeded for an extensive period of time, there wouldn't have much significant difference between hydrotherapy and taping results.

Conflicts of Interest

None.

Acknowledgement

The authors are thankful to the Principal of Liaquat National School Of physiotherapy, Mr. Hassan Abbas Rizvi and the research faculty and all the participants for their valuable efforts and time. We also thank Mr. Muhammad Nisar for the data base computerization.

Funding

None.

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