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Effect of Hypopressive exercise in women with Pelvic Organ Prolapse

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ABSTRACT

Aim: To study the effect of Hypopressive exercises to improve pelvic floor muscle strength in women with Pelvic Organ Prolapse.(grade 1 and 2).

Methods: This is an experimental study conducted on women of urban and rural areas of Kamothe and Kalamboli in India who presented with grade 1 and grade 2 Pelvic Organ Prolapse. 20 women (35 years and above) were recruited after taking their consent. The outcome measures assessed during pre and post evaluation were pelvic floor muscle strength as measured by modified oxford scale and perinometer whereas Pelvic Organ Prolapse symptoms by pelvic floor distress inventory scale-20. Intervention consisted of 6-weeks of Hypopressive exercises with a physiotherapist. The protocol consisted of three sessions weekly with progression in each week. Precautions to be taken during the study were explained to the participants each time.

Results: Hypopressive exercises presented positive results with statistically significant difference in pre and post evaluation of outcome measures. Wilcoxon Signed Rank Test analysis reported p-value of 0.00 for modified oxford scale. For perinometer, p-value for peak, average, duration and gradient was 0.00, 0.00, 0.01 and 0.04 respectively. Pelvic Floor Distress Inventory Scale reported p-value of 0.00.

Conclusion: Hypopressive exercises exhibited improvements in pelvic floor muscle strength and reducing the symptoms of Pelvic Organ Prolapse.

Keywords: hypopressive exercises, modified oxford scale, pelvic floor distress inventory scale, pelvic floor muscle strength, pelvic organ prolapse

INTRODUCTION

Pelvic Organ Prolapse (POP) is a common gynecological condition prevailing in India, characterized by descent of anterior or posterior vaginal wall, uterus or entire vaginal vault.¹ Pelvic floor muscles (PFM) play an important role in providing active and passive support to abdominal and pelvic organs. These muscles can become stretched or weakened due to ageing, pregnancy, instrumented delivery, obesity, chronic cough, and repeated physical activities that load PFM causing sagging which leads to prolapse.²⁻⁵

Amongst various conservative approaches like abdominal muscle training and postural correction, the hypopressive exercise (HE) can help to strengthen PFM.⁶ Thirty-three consecutive HEs were developed by Caufriez in which each involved a posture to be performed in different body positions (standing, kneeling, quadruped, sitting and supine) combined with a hypopressive manoeuvre in which a woman per-

forms an expiratory apnea (breath hold at the end of expiration) while drawing-in their abdomen and opening their rib cage.⁷⁻¹² They emphasize engaging transverse abdominals with conscious coordination of diaphragm with breathing; it is hypothesized to produce neuromuscular activation of PFM and abdominals; and to increase the endurance of PFM and basal tone of PFM subsequently helping in urethral constriction.^{7,9} Thus, one of the indications of these exercises is to treat POP.^{12,13}

There is little evidence that HEs training can improve POP and its symptoms.¹⁴ Hence, this study is being done to find out the effect of HEs for training PFM in women with POP (grade 1 and 2).

METHODS

Twenty women aged 35 years and above and diagnosed with POP (grade 1 and 2) participated in this

experimental study after ethical committee approval. This study was carried out in the urban and rural population of Kamothe and Kalamboli of India. Cases with tumors of bladder, neurogenic bladder, urinary tract infection, fibroid, ovarian cyst and cancer of cervix were excluded. Participants were explained about the procedure of the study and an informed written consent before assessment was taken. Demographic data, obstetric and gynecological history and pre-evaluation data were noted. Pre-evaluation of all the participants was done using the Modified Oxford Scale (MOS)¹⁵ and perinometer^{16,17} for assessing the pelvic floor muscle strength. Assessment by MOS was done by digital vaginal palpation using two fingers where the instructions were to pull the PFM in and up as strongly as possible and then relax completely. The examiner scored the correct contraction on the basis of 6-point MOS which quantifies PFM as: 0=no contraction, 1=flicker, 2=weak, 3=moderate, 4=good, 5=strong.

The Perinometer measures vaginal squeeze pressure through a conical sensor covered with a medical silicone rubber sheath. The sensor is connected to a handheld microprocessor with a latex tube, allowing measurement of squeeze pressure in centimetres of water (cmH₂O). The occlusive pressure readings from a manometer are a surrogate measure of strength. After the vaginal palpation, the probe of the perinometer was placed inside the vagina and the scale was calibrated to zero. Three readings of the perinometer were taken at 6th second 12th second 18th second and best out of three was taken.

The pelvic floor distress inventory scale (PFDI-20) was used to measure the degree of bother and distress in POP. The PFDI-20¹⁸ consists of 20 questions about bowel, bladder or pelvic symptoms; divided into 3 subscales namely- Pelvic Organ Prolapse Distress Inventory 6(POPDI-6), Colorectal-Anal Distress Inventory 8(CRAD-8) and Urinary Distress Inventory 6(UDI-6). The participants had to respond on scale 0-4 (0=not present, 1=not at all, 2=somewhat, 3=moderately, 4=quite a bit) after which the mean value of all answered questions were obtained and multiplied by 25 and score was obtained in a range from 0-100.

HEs were then given to the patient for a period of 6 week according to a protocol. These exercises focus on diaphragmatic breathing and transverse abdominals activation in various static postures. Participants were instructed to perform Hypopressive exercises in three steps: (a) slow, diaphragmatic inspiration, (b) total expiration, and (c) diaphragmatic aspiration – a movement that brings the abdominal wall to the lumbar spine (posterior and superior movement of the abdominal wall), which leads to a superior displacement of the respiratory diaphragm cupolae and supposedly decreases intra-abdominal pressure.¹² After each set, a rest pause of 5- 10 se

cond was given. [Table-1]

Table-1: 6-week Hypopressive exercise protocol

Week	Exercises	Position/ pose	Number of sets	Repeti- tions	Hold (in second)
1	Hypo- pressive	Lying	3	3	5-10
2	Hypo- pressive	Standing	3	3	5-10
3	Hypo- pressive	Standing Kneeling	3	2 2	10-15 5-10
4	Hypo- pressive	Standing Kneeling	3	1 1	10-20 10-15
5	Hypo- pressive	Standing Kneeling	3	1 1	10-20 10-30
6	Hypo- pressive	Standing Kneeling	3	1 1	10-30 10-20

Post evaluation at the end of 6th week was done using the outcome measures of modified oxford scale, perinometer and Pelvic Floor Distress Inventory Scale. Data of outcome measures were evaluated by calculation of mean and standard deviation. The relative values for each individual subject before and after the experimental protocol were compared using Wilcoxon signed rank test.

RESULTS

Amongst 20 subjects, 65%(n=13) had grade 2 prolapse whereas 35%(n=7) had grade 1 prolapse. Majority of participants were multiparous (n=18) whereas others (n=2) were nulliparous. All participants had obstetric history of Full Term Normal Delivery (FTND). Following the pre-evaluation, out of 20 subjects, 4 subjects dropped out. Hence, the study was continued with 16 subjects. Outcome measures recorded during pre and post-evaluation had positive difference and reduced symptoms in pelvic floor distress inventory scale whereas the difference calculated was statistically significant. These recorded data were not normally distributed hence analysis was done using non-parametric test (Wilcoxon Signed Rank Test). [Table-2]

Table-2: Outcome measures by modified oxford scale and perinometer

Outcome Measures	Pre- evaluation Mean±SD	Post- evaluation Mean±SD	p- val- ue	
Modified Oxford Scale	2± 0.25	3± 0	0.00	
Perinometer	Peak	26± 6	42± 10	0.00
	Average	20± 7	32± 8	0.00
	Duration	11± 3	14± 3	0.01
	Gradient	11± 9	6± 5	0.04
	PFDI-20	107± 21	44± 15	0.00

DISCUSSION

Pelvic Organ Prolapse (POP) is a very important health problem in women, but many women are still negligent and unaware of it. Patient may present with varying degree of prolapse. Majority of our participants presented with grade 2 POP due to lack of awareness towards gynaecological health and knowledge of available conservative management options.¹⁹ Majority of the participants were multiparous which is also supported by previous evidences that increase in number of parity increases the chances and degree of prolapse except a report of Quiroz LH et al.^{20,21}

Patients considered to have adequate pelvic floor contraction strength should be given at least a grade 3 on Modified Oxford Scale.²² In this study, 93.75% presented with grade 2 on MOS which were improved by the 6 week protocol of HEs to an adequate level with mean score of 3. Perinometer assessment noted that all three readings increased at end of 6 week while gradient (measure of onset of speed) was noted to decrease during post-evaluation which indicates that lesser the gradient, faster is the muscle contraction onset. This indicates improvement in PFM strength which helps in improving support of pelvic organs and counteracts increase in intra-abdominal pressure hence reducing degree of prolapse.¹²

Pelvic Floor Distress Inventory Scale -20 had three subscales namely; POPDI-6 for prolapsed symptom, CRAD-8 for colorectal and anal symptom and UDI-6 for urinary symptom. In post-evaluation assessment, improvement of symptoms was seen in all the three sub scales of PFDI-20 indicating overall improvement in symptoms of Prolapse. Barber et al²³ considered a change of 45 points or more in the summary score of the PFDI-20 to be the minimal clinically important difference in women undergoing surgery for PFD which supports our results. Studies have also demonstrated significant improvement in PDFI-20 through pelvic floor muscle training rather than watchful waiting.²⁴ This is due to the vacuum effect seen in hypopressive exercise during which both abdominal muscles and pelvic floor muscles are trained through a reflex mechanism. During the exercise no internal pressure is exerted over abdomen and pelvic floor. As a result, organs don't descend during the technique, but rather the opposite.¹⁴ Hence, we observe increasing strength and reducing symptoms. Thus, this muscle group prevents loss of urine or rectal contents. Therefore, training of PFM is recommended as a first-line conservative prevention and management strategy for women with urinary incontinence, as well as faecal incontinence which in turn aim to improve Pelvic organ Prolapse staging and symptom.²⁵⁻²⁹

According to this study, hypopressive exercises (HEs) demonstrated reduction in symptoms of POP

(grade 1 and 2) which is supported by Caufriez.¹² Navarro-Brazález B³⁰ also suggested improvement in pelvic floor dysfunction with help of pelvic floor muscle training HEs (both knack manoeuvre and home exercises); but a study done by Resende et al concluded that adding HEs to Pelvic Floor Muscle Training does not improve PFM function.¹⁰ A study by Juez L et al demonstrated increase in the levator ani muscle during postpartum period through HEs which supports the hypothesis of this study.⁸ Previous studies stated that hypopressive exercises produced improvements in the cross-sectional area of the levatorani muscle and significantly increase PFM function.³¹

Reasons given by drop out candidates reported that women did not prioritize their gynaecological health as the population was attracted to surgical management and unaware about disadvantage and advantage of surgical and conservative management respectively. Lack of education, high illiteracy rate and increasing level of poverty are making health improvements for women in India extremely difficult.³² Furthermore, this study also reported with certain limitations such as small sample size involving participants confined to certain areas. The study focused on finding the effect of HEs only on lower grades of POP excluding the higher grades and other types of Pelvic Floor Dysfunction. Likewise, long-term effect of HEs and relapse of symptoms were not evaluated. Lastly, the effect of HEs on quality of life of participants was not known.

CONCLUSIONS

Hypopressive exercises were found effective in reducing the symptoms of POP (grade 1 and 2) in various postures. These can be considered as the effective conservative line of management along with various approaches of abdominal and postural training. This study also made an attempt to create awareness about importance of gynecological health and its conservative management in woman's life.

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