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. 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, instrumental delivery, obesity, chronic cough, and repeated physical activities that load PFM causing sagging which leads to prolapse.

Amongst various conservative approaches like abdominal muscle training and postural correction, the hypopressive exercise (HE) can help to strengthen PFM. 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 performs an expiratory apnea (breath hold at the end of expiration) while drawing-in their abdomen and opening their rib cage. 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. Thus, one of the indications of these exercises is to treat POP.

There is little evidence that HEs training can improve POP and its symptoms. 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 study.
These exercises focus on diaphragmatic breathing and transverse abdominal 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. After each set, a rest pause of 5-10 second was given. [Table-1]

### 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]

| Outcome Measures | Pre-evaluation Mean±SD | Post-evaluation Mean±SD | p-value |
|------------------|------------------------|-------------------------|---------|
| Modified Oxford Scale |                         |                         |         |
| 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    |

Table-1: 6-week Hypopressive exercise protocol

| Week | Exercises | Position | Number of Sets | Repetitions | Hold (in seconds) |
|------|-----------|----------|----------------|-------------|------------------|
| 1    | Hypopressive | Lying    | 3              | 3           | 5-10             |
| 2    | Hypopressive | Standing | 3              | 3           | 5-10             |
| 3    | Hypopressive | Kneeling | 3              | 2           | 10-15            |
| 4    | Hypopressive | Kneeling | 3              | 1           | 10-20            |
| 5    | Hypopressive | Standing | 3              | 1           | 10-30            |
| 6    | Hypopressive | Kneeling | 3              | 1           | 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.
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. 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.

Patients considered to have adequate pelvic floor contraction strength should be given at least a grade 3 on Modified Oxford Scale. 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. Perimeter 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.

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 al 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. 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. 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.

According to this study, hypopressive exercises (HEs) demonstrated reduction in symptoms of POP (grade 1 and 2) which is supported by Caufriez. Navarro-Brazález B 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.

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. Previous studies stated that hypopressive exercises produced improvements in the cross-sectional area of the levator ani muscle and significantly increase PFM function.

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. 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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