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Correlation between external palpation and internal palpation of pelvic floor muscle among women

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Abstract
Background: Pelvic floor muscle anatomy and contractility are important for pelvic floor function. Pelvic floor muscle resting tone and contraction are components of the mechanism that prevents descent of the pelvic organs and maintains continence. Pelvic floor muscle contraction and strength are assessed commonly by digital palpation or perineometry (measurement of vaginal squeeze pressure).
Objective: To find out the reliability and validity of external palpation of pelvic floor muscle among women.
Study Design: Non experimental design
Methodology: According to inclusion and exclusion criteria samples were selected, pelvic floor muscle strength were assessed internally by brink score and externally graded as normal, hypotone and hypertone
Outcome Measure: Brink score and external palpation grading
Results: The result of this study shows that there exist a significant association between internal and external palpation of pelvic floor muscles. ($p<0.05$, CI-95%).
Conclusion: There exist a strong correlation between internal and external palpation of pelvic floor muscles

Keywords: pelvic floor muscle, internal palpation, brink score, external palpation

Introduction

The Pelvic Floor Muscles comprise the pelvic diaphragm muscles (pubococcygeus, puborectalis, and iliococcygeus, together known as the levator ani), which can be referred to as the deep layer, the urogenital diaphragm muscles (ischiocavernosus, bulbospongiosus, and transverses perinei superficialis, together known as the perineal muscles), which can be referred to as the superficial layer; and the urethral and anal sphincter muscles [1]. The role of pelvic floor muscle is triple 'S' which constitutes

1. Supporting visceral organs,
2. Sphinteric control
3. Sexual function [2].

Pelvic floor muscle also plays an important role in maintaining intra-abdominal pressure and maintains core stability [3, 4]. The co-activation of the pelvic floor and abdominal muscles is essential for developing intra-abdominal pressure and trunk load transfer.

Pelvic floor muscles along with transverses abdominis, Diaphragm and Multifidus makes the inner core muscles that plays an important role in maintaining lumbopelvic stability. Pelvic floor muscles has both type 1 and type 2 muscle fibres. Like other muscles pelvis floor muscles get weakened and gets a hypotonic state or become hypertonic. Hypotonic pelvic floor muscles lead to certain conditions lie stress urinary incontinence, Urogenital prolapse etc whereas hypertonic pelvic floor muscles were found in conditions like Dyspareunia, Vaginismus, Coccydynia etc. Sometimes sacroiliac joint dysfunction or hip muscle imbalance, piriformis shortening may also induce triggers in pelvic floor muscles making them exist in hypertonic state.

Grading of pelvic floor muscles is important for proper assessment and usually pelvic floor muscle is assessed by vaginal palpation [5], is one of the most common clinical methods currently used to evaluate pelvic floor muscle contraction is oxford grading, Now a days it is measured by different scales like Brink score, Modified oxford scale devices like perineometer and ultrasound imaging [6].

Proper assessment is quite essential to schedule an appropriate management for pelvic floor muscles. However, the digital palpation method which is the most common method used by women's health physiotherapist may not be appropriate for use in certain populations in which vaginal examination may be against social norms or unpleasant and in country like india it becomes very difficult to get consent from the patients and patients are not comfortable with postioning and hand placement with in the vagina.

Ultrasound imaging is on the other hand is costly which is bit difficult to the low economic patients. External palpation of pelvic floor muscle is another technique to assess the pelvic floor muscle strength where the pelvic floor muscle palpated externally and graded as normal, hypotone and hypertone [7]. There are no studies which documented the correlation of external palpation and internal palpation. So, this study is designed to find the correlation between external palpation and internal palpation of pelvic floor muscle among women.

Methodology

This study was non-experimental design, observational type.

11 women were conveniently selected from SRM Medical College Hospital and Research Centre Kattankulathur. Women with the age of 30-60 years were selected for this study. Women with active gynaecological infection, pregnant women and women with menstrual bleeding were excluded from this study. Informed consent was taken from all the women after a detailed explanation about the procedure of the study. The selected women underwent both internal and external palpation of pelvic floor muscle to find the correlation between external palpation and internal palpation of pelvic floor muscle among women.

Internal palpation of pelvic floor muscle

Subject was placed in crook lying and legs abducted, Therapist was positioned in front of the patient, Hands were washed and fit in vinyl or latex glove. On the Index finger and middle finger lubrication gel was applied. First index finger was placed inside the vagina and then middle finger was inserted and the subject was instructed to hold the therapist fingers as strong as she can and then to lift the fingers inward and upward. Internal palpation was graded with Modified oxford scoring.

External palpation of the pelvic floor muscle

Subject was positioned in side lying with hips and knees in 90-90 position with good pillow support for good palpation of pelvic floor muscle. The therapist hands was washed cleanly and glove was worn and was positioned behind the subject to easily palpate and find the tip of the ischial tuberosity and ilium, The therapist hand should be supinated with palm facing up and with all four fingers adducted in full finger extension. Gentle pressure was applied inwards directing towards anterior superior iliac spine. Deep palpation to be done more medial to the ischial tuberosity to find leavtor ani muscle, obturator internus by changing the angle of the hand where wrist drops and fingers move upward and palpation were graded as normal, hypertone and hypotone.

Results

Table 1: Correlation between External and Internal palpation of pelvic floor muscle

	Mean	Std. deviation	R value	Sig.
Internal palpation	2.09	1.044	.962**	.000
External palpation	1.55	.688		

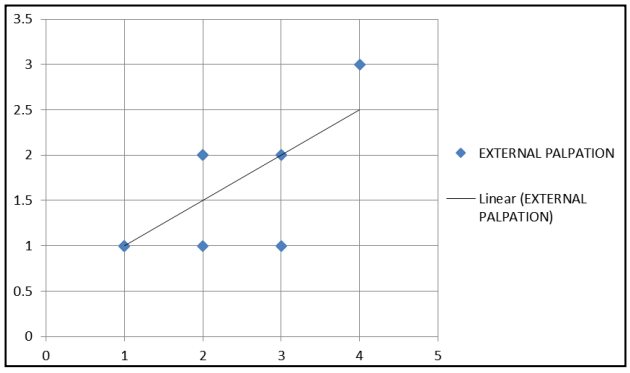

Fig 1: Correlation between External and Internal palpation of pelvic floor muscle

Discussion

Pelvic floor muscle requires a proper assessment to effectively manage it through different conditions. But due to reluctancy of the subjects pelvic floor muscle assessment through vaginal examination becomes quite difficult.

In certain conditions of gynaecological infections and dyspareunia vaginal assessment of pelvic floor muscles becomes very difficult. So there arised a need to assess the pelvic floor muscle by any other external means.

Even the electrode in perineometer or ultrasound examination requires intravaginal electrode which also subject feels discomfort at placement and removal of the electrode, further more sterilisation of those electrodes also is difficult and those electrodes or perineometer is unavailable in India, so the cost and unavailability of these equipments make the assessment procedure still more difficult.

In 1976, Hoppenfeld had introduced a concept of external palpation of pelvic floor muscles but there exist no awareness among physiotherapists and no research exist to document its uses [8].

Further more lot of male subjects were also nowadays report of pelvic floor dysfunctions where assessment of pelvic floor muscles is still a difficult task. So this study mainly aimed to correlate this technique of external palpation with the commonly used internal palpation to provide a proper assessment of pelvic floor muscles.

The result of this study shows that there exist an significant association between internal and external palpation of pelvic floor muscles. ($p<0.05$, CI-95%).

So far no study had documented on external palpation of pelvic floor muscles. This study recommends that as there is a significant correlation between both the methods which denotes that they will yield the same results if done properly, this method can be used to assess pelvic floor muscle power in patients not willing for an internal evaluation, in male patients, Dyspareunia patients. Future studies should be done to find the inter and intra rater reliability of external palpation of pelvic floor muscles.

Conclusion

There exist a strong correlation between internal and external palpation of pelvic floor muscles and thus external palpation of pelvic floor muscles can be advised for appropriate patients and can be practised by women health physiotherapist for assessing and documenting pelvic floor muscle strength.

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