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Effect of Core Exercises in Genital Prolapse Postnatal: scoping review

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Abstract: **Background: Genital prolapse is a common problem in women. It affects their quality of life, prolapse was up to seven times more common in ladies who had more than seven children compared to those who had one Objective: This study was an attempt to determine the effect of core exercises and interferential therapy in treatment of postnatal genital prolapse Methods: Twenty multiparus females suffering from genital prolapse post-natal participated in this study. Their ages ranged from (25-40) years and their body mass index not exceed 30 Kg/m^2. They were divided into two equal group. The study group (A) received core exercises and interferential therapy for 12 sessions (one every other day)3 times per week. While the control group (B) received interferential therapy only. Results: There were a highly significant improvement in pelvic floor muscle strength after treatment in each group and there was a highly significant difference between groups in pelvic floor muscle strength favoring group (A). Conclusion: We found that core exercise are excellent in improving pelvic floor muscle strength in treating post-natal genital prolapse.**

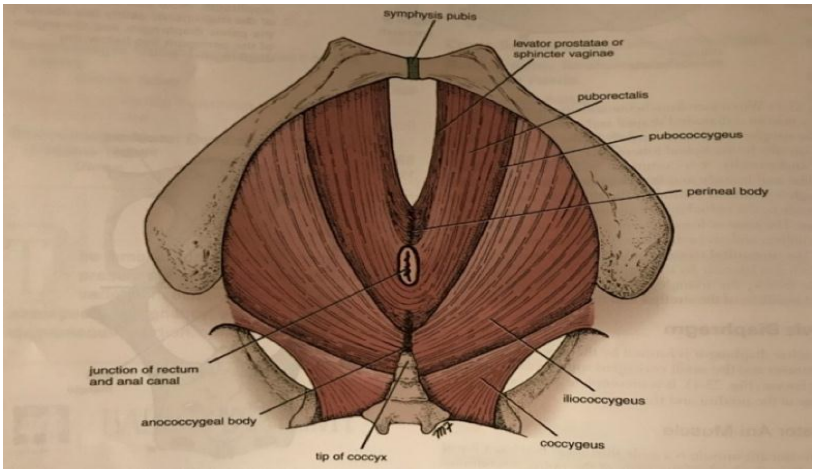
Keywords: **Genital prolapse, Core exercises, Interferential therapy, Postnatal.**

I. LITRATURE REVIEW

The pelvic floor muscle comprises of two groups of muscles: the urogenital diaphragm and the pelvic diaphragm. The urogenital diaphragm is the most inferior supporting structure of the pelvic floor. It comprises of the bulbocavernosus, transversalis, and ischiocavernosus muscles, and its work is to provide stabilization of the perineal body (onto which these muscles insert), which in turn supports the anal sphincter and the lower vagina.

The pelvic diaphragm contains the levator ani, obturator, and coccygeus muscles, of which the levator ani is functionally the most important and comprise of the puborectalis, pubococcygeus, and iliococcygeus. The puborectalis originates from the posterior aspect of the pubis and inserts medially into the perineal body, the vagina, and the lower anal canal.

The pubococcygeus originates from the pubis and inserts into the coccyx. The iliococcygeus originates from the arcus tendinous levator ani and inserts into the coccyx. [(1)] **(Fig. 1)**



Root and body of the perineal muscles (Richard S, 2007) (Fig.1)

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The pelvic floor muscles have two fibers: Type 1 fibers show tonic action and are engaged at lower levels of work and during most extreme sustained contraction. Type 2 fibers are selected during maximal pelvic floor action creating a brisk forceful contraction but exhausting quickly. An exercise regimen has to incorporate work for both fiber types [(2)].

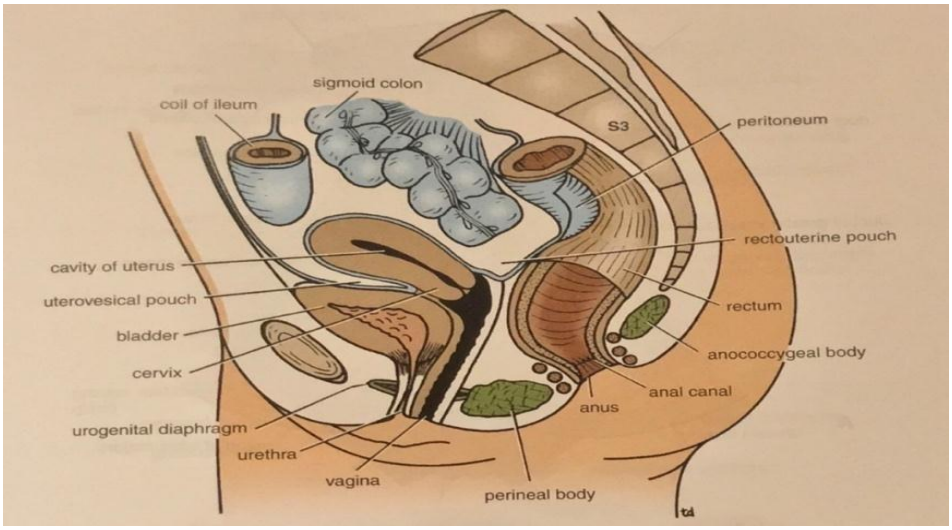
The PFM forms part of the functional unit of the local muscles system including the transversus abdominis [(3)], the diaphragm[(4)]and deep fibers of lumbar multifidus[(5)].The muscular fibers of the levator ani comprise of slow and fast twitch fibers. The slow twitch fibers provide basal tone; the fast twitch fibers permit voluntary control and reflex contraction in response to rapid increases in intra-abdominal pressure (e.g., cough, sneeze) [(1)].

The major ligaments cardinal ligaments (also called the transverse cervical ligaments of Mackenrodt) expand from the lateral margins of the cervix and upper vagina to the lateral pelvic walls. The uterosacral ligaments are attached to the cervix and upper vaginal fornixes posterolateral. Posteriorly, they attach to the pre-sacral fascia in front of the sacroiliac joint. The connective tissue of the uterosacral ligaments is continuous with that of the cardinals around the cervix. The cardinal and uterosacral ligaments hold the uterus and upper vagina in their proper place over the levator plate [(6)]. Pubocervical ligament is a condensation of endopelvic fascia, which expands anteriorly from the cervix to the pubic symphysis [(7)].

The vagina is a fibromuscular tube. It extends from the cervix to the vestibule of the vagina. The vagina is the longest part of the birth canal, and its distention during childbirth is limited by the ischial spines and sacrospinous ligaments [(7)].

The uterus is located inside the pelvis immediately posteriorly to the urinary bladder and anteriorly to the rectum. It‘s pear like shape and about 3 in. (7.6 cm) long, 4.5 cm broad (side to side) and 3.0 cm thick (anteroposterior). A Non-pregnant adult uterus weighs about 50 grams. The uterus can be divided anatomically into four segments: The fundus, corpus, cervix and the internal os [(8)].

The urinary bladder is a muscular hollow sac in the pelvis, just above and behind the pubic bone. When empty, the bladder is roughly boat shaped. The rectum comprises the terminal 12-15 cm of large bowel, from the rectosigmoid junction above to the ano-rectal angle below. It occupies the hollow of the sacrum and is wholly extraperitoneal posteriorly. Its anterior aspect is extra.



Sagittal section of the female pelvis (Richard S, 2007) (Fig.2)

Peritoneal only in its lower third, where it is a direct posterior relation of the bladder, seminal vesicles and prostate in the male, and the cervix uteri and posterior wall of the vagina in the female. Surrounding the extraperitoneal rectum are layers of the endopelvic fascia that support and define rectal and perirectal structures. This fascia has parietal and visceral [(9)]. **(Fig. 2)**

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II. CHANGES DURING PREGNANCY (ANTENATAL)

Amenorrhea of mensuration following the fertilization of the ovum is the first sign of pregnancy, as pregnancy progresses, the length and thickness of the uterus increases. The loweruterine segment develops, softens, and stretches and collagenous supportive tissue increases, become more elastic thin the cervix, there is formation of a mucous plug, acting as a barrier to infection.

Progesterone decreases smooth muscle tone, initiates sensitivity to CO in the respiratory center, and causes an increase in maternal temperature, breast development, and storage of fat deposits for milk production.

Oestrogen affect the growth and development of the uterine and breast, prepares prime receptor sites for relaxin (pelvic joints), and causes increased water retention. The collage is replaced by the Relaxin in target area with a modified form, which has greater pliability and extensibility. It has a softening effect on connective tissue (pelvic floor and abdominal fascia), increase extensibility in those structures.

Neuromuscular Changes Abdominal and pelvic muscles participate to spinal and pelvic stability via active tension exerted on the passive ligamentous and fascial stability structures. Passive joint instability (as seen in pregnancy) alters afferent input from joint mechanoreceptors and probably affects motor neuron recruitment. According to Bullock-Saxton (1998): Muscle spindle regulation may alter, resulting in decreased muscle stiffness (tension) around a joint and, therefore, a decrease in active stability [(2)].

During pregnancy the pelvic floor is stretching and trauma/tearing during labor and vaginal delivery. It is now thought that the function of transversus abdominis and the pelvic floor musculature are closely associated, with voluntary activity in the deep abdominal muscles resulting in increased pelvic floor muscle activity.

Discovers apparent that parous women have a higher prevalence of pelvic organ prolapse than nulliparous women has led to the perception that pelvic organ prolapse is a long term effect of aninjury acquired during vaginal childbirth.

The fact that not only vaginal delivery can development of pelvic organ prolapse as well as the caesarean delivery is not fully protective because the pregnancy itself can induce persistent change in pelvic organ support [(10)].

III. THE ANATOMICAL CHANGE DURING CHILDBIRTH

The uterus in pregnancy can be divided into three parts:

1- The upper uterine segment 2- The lower uterine segment 3- The uterine cervix.

Upper uterine segment this portion of the uterus consists of the fundus and that part of theuterus lying above the reflection of the vesico- uterine fold of peritoneum.

During pregnancy it undergoes the greatest degree of myometrial hyperplasia and hypertrophy. In labour it provides the strong contractions that push the fetus along the birth canal. Lower uterine segment this portion of the uterus lies between the vesico-uterine fold of the peritoneum superiorly and the cervix inferiorly. During pregnancy the upper part of the cervix is incorporated into the lower uterine segment, which stretches to accommodate the fetal presenting part [(11)].

In late pregnancy, as the upper segment muscle contractions increase in frequency and strength, the lower uterine segment develops more rapidly and is stretched radially to permit the fetal presenting part to descend. In labor the entire cervix becomes incorporated into thestretched lower uterine segment. In late pregnancy the cervix becomes softer because of chemical changes in the collagen fibers, and shorter as it is incorporated into the lower uterine segment. It also undergoes a variable degree of dilatation [(11)].

Collectively, these changes are termed cervical ripening. The changes may occur abruptly or gradually at any time after the 34th week of pregnancy, but usually occur nearer term, especially in primigravidae. At the 34th gestational week the cervix is 2 cm or more dilated in 20% of primigravidae and in 40% of multigravida, and the proportion increases towards term [(11)].

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IV. PARTURITION

At the onset of labor, the cervix of a primigravida is ripe, and is either partly, or not, effaced (i.e., incorporated into the lower uterine segment). Formation of the birth canal during labor when myometrial contraction and retraction have led to full dilatation of the cervix the fetal headdescends into the vagina, which expands to encompass it normally an apparent space, the vaginal muscle has hypertrophied and the epithelium become folded during pregnancy so that it can accommodate the fetus without damage [(11)].

As the fetal head descends it encounters the pelvic floor and the leading point is directed forwards by the gutter formed by the levatores ani. The fetus must now pass through the urogenital diaphragm. The levator muscles stretch and are displaced downwards and backwards, so that the anus receives the full force of the descending head and, dilating, gapes widely to expose the anterior rectal wall. Pressure is also exerted on the lower part of the vagina and the central portion of the perineum, and as head is born the tissues may tear [(11)].

The descent of the fetus from the uterus and out into the world is straight to the level of the ischial spines; it then moves in an anterior curve around the lower border of the symphysis pubis. If the pubic arch is wide, the head will stem close behind the symphysis and the perineum will not be so stretched. If the angle is narrow the head is forced back, the direction of the curve is more obtuse and perineal damage is likely [(11)].

V. PELVIC ORGANS PROLAPSE

Pelvic organs prolapse is the descent of the apex of the vagina or cervix (or vaginal vaultafter prolapse organ Pelvic hysterectomy), anterior vaginal wall (previously referred to as cystocele‖), or posterior progresses, organs can protrude as prolapse vaginal wall (previously called –rectocele‖).outside the vaginal canal [(12)].By far, the greatest incidences of prolapsing are after childbirth. Pregnancy and vaginal delivery are the risk factors cited most.

All of these combine to weaken the pelvic floor and create conditions for a prolapsed uterus. Moreover, harder labors and big babies also contribute to pelvic floor weakening. Delivering a baby bigger than 8 ½ pounds can carry a risk of pelvic prolapse. Childbirth is not the only contributing factor to pelvic prolapsed risk factors for development of pelvic organs include aging, menopause, smoking and chronic diseases [(13)].

Childbirth was found to be associated with a variety of muscular and neuromuscular injuries ofthe pelvic floor that are linked to the development of anal incontinence, urinary incontinence,and pelvic organ prolapse. Risk factors for pelvic floor injury include forceps delivery, episiotomy, prolonged second stage of labor, and increased fetal size [(14)].

Prolapse are due to a weakness or damage occurred to the structures which hold the pelvic organs in place. The most significant causal factor for prolapse is having babies. During pregnancy, hormonal changes and the overweight and pressure of the baby can contribute to the weakening of the pelvic floor. In addition, a vaginal delivery can result in the supporting pelvic structures being stretched or torn. Damage to the pelvic floor occurs particularly in long second stages of labour, instrumental deliveries (the use of forceps or vacuum extraction) and in the delivery of large infants. Often damage that occurs during pregnancy and childbirth goes unnoticed at the time, with symptoms only developing later in life, following menopause [(15)]

Symptoms of genital prolapse are mainly non-specific. Common symptoms include [(16)] the feeling of a lump ("something coming down"), low backache heaviness and dragging sensation, or the need digitally to replace the prolapse in order to defecate or pass urine. It can occur with other lower urinary tract dysfunction and may mask incontinence [(2)]

VI. TREATMENT

Treatment depends mainly on severity of the symptoms, patient's age and general health.

1. Conservative treatment: When only a mild degree of pelvic relaxation is present, pelvicfloor muscle exercises may improve the tone of the pelvic floor musculature [(16)]:

A) Pelvic floor muscles (Kegel) exercises may improve symptoms caused by mild forms of prolapse by strengthening the levator ani muscle [(17)].

B) Interferential currents providing motor excitation is considered by many to represent an 678. 9advance over the other

low-frequency methods of stimulation. The optimum frequency of stimulation for most voluntary muscle appears to be 40-80 Hz, whilst visceral muscle, supplied by the autonomic nervous system, is stimulated optimally at 10-50 Hz. The electrical current is applied to the affected area using four electrodes. The four electrodes are placed in such a way that the two currents produced cross each other in the affected area. Thetwo currents can be applied so that they cross deep within the actual point. Where the two currents meet, they interfere with each other; hence the name interferential. [18]

C) Pessaries which provide intravaginal support, may be used to correct prolapse by internally supporting the vagina. They can be considered when the patient is medically unfit or refuses surgery or during pregnancy and the post-natal period [17]. There are 2 types of pessaries the supportive variety e.g.: ring pessary and the space occupying variety e.g.: Gellhorn pessary [19].

2. Surgical treatment: The main objectives of surgery are to relieve symptoms and restore normal anatomic relationships and visceral function. Preservation or restoration ofsatisfactory coital function, when desired, and a lasting operative result are also important goals [17].

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