



Volume 4| Issue 29|2023

GYNAE SPECTRUM

Dear Doctor,
Greetings from Micro Labs. We are happy to bring you “Gynae Spectrum”, which contains latest and interesting news in the field of Obstetrics and Gynecology.

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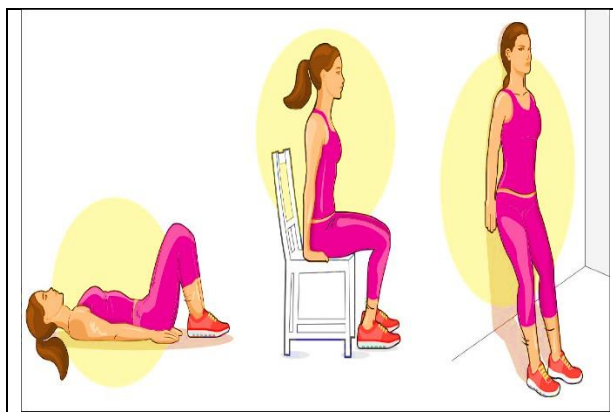
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Medical Team, Micro Labs Limited

A study on assessing the impact of an 8-week hypopressive exercise training regimen on urine incontinence and pelvic floor muscle activation

Introduction: Pelvic floor dysfunction (PFD) is one of the most frequent gynaecological issues among women worldwide. It is a collection of diseases including urine incontinence (UI), pelvic organ prolapse (POP), faecal incontinence, sexual dysfunction, and other uro-genital symptoms that are brought on by a weakening of the pelvic floor's (PF) supporting tissues. This condition has negative social, health, and economic effects and is associated with a decline in quality of life (QoL). The intensity of the symptom can be made worse by delivery, obesity, constipation, pelvic surgery, hard lifting, and the impact of a person's genetic background.¹ An effective physical therapy treatment for women with UI is pelvic floor muscle training (PFMT). People who have UI frequently struggle with sadness, stigma, and embarrassment. It may have an effect on sexual activity and social interactions, causing emotional and psychological issues. Many women are prevented from being physically active by UI, which happens during physical activity.² The purpose of this study was to evaluate the effects of an 8-week, carefully monitored programme of hypopressive exercises on the strength of the pelvic floor muscles and the symptoms of urine incontinence.



Methods: In this blinded randomised controlled trial, 117 women with symptoms of urinary incontinence and pelvic floor dysfunction were included. Participants were randomly divided into the hypopressive exercises group (n = 62) or the control group (n = 55). The Modified Oxford Scale (MOS) was used to digitally check the PFM to measure its strength and function, and the Pelvic Floor Distress Inventory (PFDI-20) was used to measure the symptoms of vaginal prolapse, colorectal symptoms, and urine symptoms. The Pelvic Floor Impact Questionnaire [PFIQ-7] was used to measure the impact of pelvic floor disorders (PFD) on women's lives, while the International Consultation on Incontinence Questionnaire [ICIQ] was used to measure the severity of symptoms related to urine incontinence.

Results: The hypopressive exercises group had higher post-intervention test scores, which used PFM contractility as a proxy for perineal function and was assessed by MOS. The PFIQ-7 and PFDI-20 questionnaires were used to examine the effects of PFD on health. Only the PFDI20 questionnaire scores showed significant impacts for the primary variable group. Additionally, the post-intervention measure for the PFIQ7 total score showed a considerably lower value for the experimental group (EG) ($p < 0.001$) with a high effect size. The experiment group attained considerably lower values than the control group in the post-intervention values for both the

FPDI20 overall score ($p < 0.001$) and the subscales. The experiment group had substantially lower scores on the ICIQSF both after the intervention period ($p < 0.001$) and in the comparison between groups post-intervention ($p < 0.001$), in both cases with a significant effect size difference. (Figure 1) A high level of treatment adherence (97%) and no adverse effects were also mentioned.

Discussion: The experiment group in this study had substantially lower ICIQSF scores both after the intervention period and in the comparison of the groups post-intervention, both with a large effect size difference. In comparison to Luginbuehl's study, H. et al.'s research revealed that the ICIQ-UIsf experiment group and control groups did not differ in any way from each other using mixed effect regression analysis.³

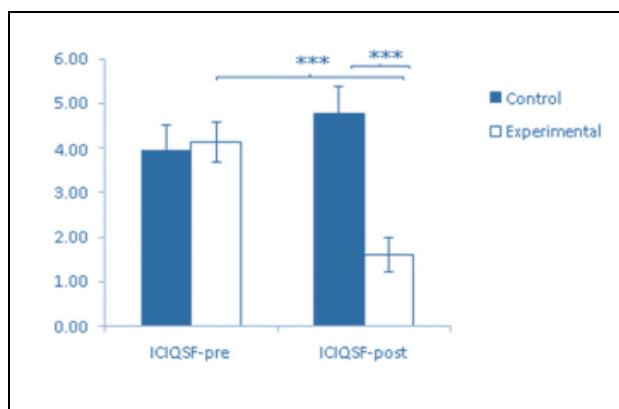


Figure 1: Comparison of the impact of urine incontinence symptoms and severity across and within groups on women's quality of life using the ICIQSF.

Conclusions: This study concludes that the symptoms of pelvic floor problems can be reduced by doing an 8-week intervention of hypopressive exercises. Additionally, it has been noted that the intensity and symptoms of urine incontinence have decreased and the contractility of the pelvic floor muscles has improved.

The Pelvic floor muscle (PFM) contractility of women who underwent hypopressive exercise improved, and the intensity and symptoms of urine incontinence were reduced.

Reference:

1. Molina-Torres G, et al. The effects of an 8-week hypopressive exercise training program on urinary incontinence and pelvic floor muscle activation: A randomized controlled trial. *Neurourology and Urodynamics*. 2023 Feb;42(2):500-9.
2. Murray AS. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women. *Res Nurs Health*. 2019; 42:234-235. doi:10.1002/nur.21946
3. Luginbuehl, H. *et al*. Involuntary reflexive pelvic floor muscle training in addition to standard training versus standard training alone for women with stress urinary incontinence: a randomized controlled trial. *Int Urogynecol J* 33, 531–540 (2022).

A study on evaluating the relationship between cerebral biomarkers in the blood and cognitive evaluation scores in women with pre-eclampsia and eclampsia

Introduction: Pre-eclampsia is a condition that only affects pregnant women and is recognised by the appearance of hypertension and end-organ involvement after gestational week 20. It affects 3–5% of all pregnancies and, particularly in low- and middle-income countries, is a major cause of maternal morbidity and death. Eclampsia, cerebral oedema, and intracranial haemorrhage are some of the acute cerebral consequences of pre-eclampsia. These women will likely experience elevated lifetime chances of developing stroke, vascular dementia, and Alzheimer's disease, as well as epilepsy.¹ Cerebrospinal fluid (CSF) or blood (plasma or serum) can be used to detect cerebral biomarkers, which are proteins that are highly unique to the central nervous system. Tau, glial fibrillary acidic protein (GFAP), and circulating neurofilament light (NfL) are helpful diagnostic and prognostic biomarkers for a number of neurologic illnesses, including Alzheimer's disease and traumatic brain injury. When there is axonal damage, NfL and tau levels rise, but GFAP levels rise when glial cells are involved.² This study aimed to examine the relationship between pre-eclampsia women's plasma concentrations of these biomarkers and their cognitive function evaluation scores.

Methods: In this study, 18 women with normotensive pregnancies and 49 women with eclampsia, 16 women with pre-eclampsia complicated by pulmonary oedema, and 22 women with pre-eclampsia without pulmonary oedema, HELLP, or neurological sequelae were included. At the time of inclusion, blood samples were taken in ethylenediaminetetraacetic acid (EDTA) tubes for plasma extraction. The Montreal Cognitive Assessment (MoCA) was used to evaluate cognitive function. The MoCA is an objective exam that measures a number of cognitive functions, including language, executive function, memory, orientation, visuospatial ability, abstract thought, and attention. Using Spearman correlation that was corrected for the amount of time after an eclamptic seizure, the relationship between cognitive evaluation scores and plasma concentrations of brain biomarkers was examined.

Results: Pregnant women who had pre-eclampsia worsened by pulmonary oedema had a higher body mass index, shorter gestational ages, lower birthweight babies, and more frequent preterm births. In comparison to women with normotensive pregnancies, those with eclampsia and pre-eclampsia with pulmonary oedema exhibited lower MoCA scores. In women with eclampsia and women with pre-eclampsia and pulmonary complications, there was a link between impaired cognitive performance and elevated plasma concentrations of NfL. (Table 1) In pre-eclampsia patients without pulmonary oedema, HELLP, neurological problems, or normotensive pregnancies, there was no association between decreased cognitive performance and NfL. There was no association between tau or GFAP levels in any group and cognitive impairment.



Group	n=	MoCA-scores	p-value	NfL (pg/mL)	p-value	tau (pg/mL)	p-value	GFAP (pg/mL)	p-value
Normotensive pregnancy	18	27.5 (24.0–29.0)	–	8.23 (4.08–10.4)	–	2.61 (1.47–4.40)	–	27.6 (17.4–41.9)	–
Pre-eclampsia without pulmonary oedema, HELLP or neurological complications	22	26.5 (24.8–28.3)	ns	14.8 (9.89–22.3)	<0.001	3.64 (2.47–5.25)	ns	48.1 (31.2–58.6)	<0.05
Pre-eclampsia with pulmonary oedema	16	23.0 (19.0–26.8)	<0.001	17.9 (14.1–29.5)	<0.001	3.63 (1.99–7.16)	ns	71.7 (46.7–129)	<0.001
Eclampsia	49	21.0 (19.0–26.0)	<0.001	18.0 (10.0–30.4)	<0.001	6.30 (3.90–10.7)	<0.001	115 (62.1–199)	<0.001

Table 1: MoCA-scores and cerebral biomarkers related to groups.

Discussion: In this investigation, women with eclampsia, pre-eclampsia, and pulmonary complications had significantly higher plasma concentrations of NfL and decreased cognitive performance. In either group for tau or GFAP, there was no association with cognitive impairment. According to research by Bergman L. et al., compared to healthy controls, preeclampsia patients had significantly higher plasma concentrations of tau and neurofilament light chain at weeks 33 and 37 of pregnancy, respectively.³

Conclusions: This study concludes that there is an association between the evaluation of poor cognitive function and plasma NfL concentrations in pregnant women with eclampsia and pre-eclampsia worsened by pulmonary oedema.

Acute neurological difficulties in pre-eclampsia may be predicted by cerebral biomarkers, and they may also be used to diagnose patients and predict long-term cerebral outcomes.

References:

1. Bokström-Rees E, et al. Correlation between cognitive assessment scores and circulating cerebral biomarkers in women with pre-eclampsia and eclampsia. *Pregnancy Hypertension*. 2023 Mar 1; 31:38–45.
2. Bergman L, et al. Cerebral biomarkers in neurologic complications of preeclampsia. *American Journal of Obstetrics and Gynecology*. 2022 Aug 1;227(2):298–e1.
3. Bergman L, et al. Blood-based cerebral biomarkers in preeclampsia: plasma concentrations of NfL, tau, S100B and NSE during pregnancy in women who later develop preeclampsia-a nested case control study. *PLoS One*. 2018 May 2;13(5): e0196025.



A study on assessing the relationship between medically assisted reproduction and mental health

Introduction: The number of women relying on medically assisted reproduction (MAR), which includes procedures like ovulation induction, artificial insemination, and assisted reproductive technology (including in vitro fertilisation [IVF] and intra-cytoplasmic sperm injection), has increased quickly around the world as childbearing is being postponed more and more and infertility treatments are becoming more accessible.¹ It has been suggested that MAR children may have more psychological health issues than children who were conceived naturally (NC). First, using MAR is linked to a higher chance of having a child who is premature or has a low birth weight, both of which may lead to poorer results in later life. Second, as compared to natural conception, MAR conception may be linked to greater levels of parental stress, which may have an impact on children's psychological development and parent-child interactions.² The goal of this study was to determine whether there was a long-term relationship between medically assisted reproduction and women's mental health outcomes prior to, during, and following their treatments, as well as whether the therapy resulted in a live delivery.

Methods: In this study, 575,921 women's data were collected from Finnish registers from 1995 to 2018. From 1996 to 2016, 97.73% had their first child (5.89% after MAR), whereas 2.27% remained childless after getting MAR treatments. Estimating the likelihood of purchasing psychotropic medications (antidepressants, anxiolytics, hypnotics, and sedatives) for three groups of women who: group 1- had natural conception (NC), group 2- had medically assisted reproduction treatments, or group 3- had medically assisted reproduction but remained childless. After that, the investigators followed up with women for up to 12 years before and 12 years after the reference date, which was the date of conception for women who gave birth to their first live child either naturally or through medical assistance, or the date of their last medically assisted reproduction treatment for those who had not given birth by the end of 2017.

Results: In this study, during the 24-year follow-up, 33.4% of women purchased psychotropic drugs in at least one 6-month period, with 15% making at least one purchase in the 12 years prior to the first pregnancy or the last MAR cycle and 27.3% in the 12 years that followed. Different percentages of the three groups used psychotropic substances: 25% of MAR women used psychotropics before having their first child, compared to 14.5% and 18.9% of NC and MAR+ women, respectively. (Table 2) Psychotropic drug purchases were higher among women who failed to give birth after receiving medically assisted reproduction therapies than among those who gave birth after conceiving naturally or through medically assisted reproduction, and these differences persisted over time. In comparison to women who gave birth naturally or after medically assisted reproduction procedures (11.11%) and women who gave birth after spontaneous conception (12.17%), 17.73% of women who had medically assisted reproduction but did not have children bought psychiatric drugs.



Psychotropic purchases	NC		MAR+		MAR–		Total	
	Mean (%)	SD	Mean (%)	SD	Mean (%)	SD	Mean (%)	SD
Before conception or last cycle date	14.48	35.19	18.85	39.11	25	43.3	14.98	35.68
After conception or last cycle date	27.04	44.42	27.87	44.84	37.9	48.52	27.33	44.57
Before and/or after conception or last cycle date	32.93	47	36.15	48.04	45.24	49.77	33.4	47.16
Number of observations	528,913		33,942		13,066		575,921	

MAR+, women who conceived after medically assisted reproduction treatments; MAR–, women who underwent medically assisted reproduction treatments and remained childless; NC, women who conceived naturally; SD, standard deviation.

Table 2: Purchases of psychotropic medications before and after conception or the final medically assisted reproductive therapy

Discussion: In this study, women who failed to give birth to a live baby after having medically assisted reproduction therapies bought more psychiatric drugs than women who gave birth after conceiving naturally or with the use of assisted reproductive technology. According to Wang C. et al., study children conceived with the use of ARTs had cumulative occurrences that were generally equivalent or lower across all age groups. Children of infertile couples who did not use ARTs were shown to have a slightly higher overall risk of anxiety and mood disorders.³

Conclusion: This study concludes that the similarities in psychotropic purchases between women who gave birth to live children, whether naturally or through medically assisted reproduction, imply that involuntary childlessness rather than stress related to treatment may have been a bigger factor in the higher psychotropic use among women who failed to have children after undergoing medically assisted reproduction.

Involuntary childlessness rather than stress from the procedure likely contributed more to the greater psychotropic use among women who didn't have children after receiving medically assisted reproduction.

References:

1. Goisis A, et al. Medically assisted reproduction and mental health: a 24-year longitudinal analysis using Finnish register data. American Journal of Obstetrics and Gynecology. 2023 Mar 1;228(3):311-e1.
2. Barbuscia A, et al. The psychosocial health of children born after medically assisted reproduction: Evidence from the UK Millennium Cohort Study. SSM-population health. 2019 Apr 1; 7:100355.
3. Wang C, et al. Long-term follow-up of psychiatric disorders in children and adolescents conceived by assisted reproductive techniques in Sweden. JAMA psychiatry. 2022 Feb 1;79(2):133-42.

A case of uterine fibroid-related uterine torsion in non-pregnant women

Introduction: The term "uterine torsion" refers to a condition when the uterus is rotated more than 45 degrees along its longitudinal axis. Only very infrequently can non-pregnant women have uterine torsion, which is more common in pregnant women. The clinical manifestations of uterine torsion can range from asymptomatic to moderate abdominal discomfort to severe abdominal pain with shock.¹ A torn gravid uterus is linked to a high perinatal death rate of about 12% in some cases. For the majority of obstetricians, uterine torsion is a "once-in-a-lifetime" diagnosis. Because delayed diagnosis can have serious long-term repercussions because it is rare.² In this case, computed tomography and magnetic resonance imaging were used to highlight the torsion of the non-gravid uterus in addition to a sizable intramural leiomyoma.

Case presentation: A female patient of 60 years of age was admitted to the hospital with chief complaints of lower abdominal discomfort that had abruptly started the day before. A CT scan revealed a uterine tumour measuring around 20 cm in size, and the patient had a history of miscarriage. An intrauterine device was inserted 26 years ago. patient reported a palpable abdominal mass for the past 10 years but no pain. Physical examination revealed abdominal distension, a palpable mass that was around 20 cm in size, and generalised abdominal pain. A significant tumour in the pelvic cavity was seen on vaginal ultrasonography, and the bilateral ovaries were not clearly seen. A tumour of around 21 cm by 23 cm by 16 cm was seen in the abdominal cavity on a contrast-enhanced abdominal CT. This tumour was attached to the cervix and supplied with blood via the uterine blood vessels. There was a vortex sign, sometimes known as a whirlpool sign, between the mass and the cervix. Although there were several calcifications inside the bulk, there was no contrast enhancement. Ovaries on either side were visible. The abdominal cavity had a minor quantity of ascites. (Figure 2) At the bottom of the lump, an intrauterine device was seen.



Figure 2: Contrast-enhanced computed tomography (CT) scans highlight an intramural leiomyoma in the uterus as a well-defined, heterogeneous abdominopelvic soft tissue mass with calcifications.

A pelvic MRI was done to evaluate the tumour in detail. Well-defined and unevenly hypointense on T2, moderately or hypointense on T1, and unevenly contrast-enhancing on T1 were the characteristics of the mass. Inferior to the bulk, a vortex-like structure was seen that was related to the top portion of the cervix. The uterine body could not be seen clearly. These results raised suspicion that a leiomyoma within the uterine floor wall was torsioning the

uterine body. The ovaries on both sides may have been twisted together since the ovaries on both sides were difficult to see on CT and the ovarian arteries intersected the vortex formation.

A bilateral salpingo-oophorectomy was performed on the patient, along with a complete abdominal hysterectomy. The uterus was turned 360 degrees clockwise, and the surgical results revealed a lump in the uterine floor that was around 22 cm in size and had distinct borders. In addition, the bilateral adnexa were twisted (Figure 3). The lump was determined to be a uterine fibroid by pathological investigation without any bleeding or infarction. Bilaterally, there were no abnormal findings in the adnexa. The patient was discharged without any complications.

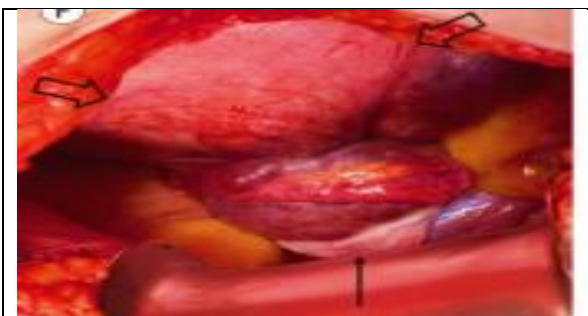


Figure 3: An intraoperative picture of the lower uterine segment shows an enlarged uterus with a massive mass (open arrows) rotated 360 degrees along its long axis.

Discussion: In this investigation, contrast-enhanced computed tomography (CT) scans revealed an intramural leiomyoma in the uterus as a well-defined, heterogeneous abdominopelvic soft tissue mass with calcifications. Similar to Chua KJ et al., CT imaging revealed a heterogeneous mass in the pelvis measuring 18x12.5x14cm with surrounding ascites and a twist in the lower uterine segment, worrying about a potential uterine torsion.

Conclusion: This study concludes that if a woman experiences acute abdominal pain and has risk factors for uterine torsion, such as large fibroids or uterine malformations, it is crucial to be suspicious of uterine torsion and understand the findings of uterine torsion on imaging in order to ensure early diagnosis and treatment.

Uterine torsion can cause life-threatening complications and infertility if diagnosis is postponed. Pregnant women are more likely to experience uterine torsion than non-pregnant women.

References:

1. Kim Y, et al. Uterine Torsion Due to Uterine Fibroid in Non-Pregnant Women: A Case Report. *Advances in Obstetrics and Gynecology Research*. 2023 May 5;1(1):1-4.
2. Liang R, et al. Uterine torsion: a review with critical considerations for the obstetrician and gynecologist. *Translational Research in Anatomy*. 2020 Nov 1; 21:100084.
3. Chua KJ, et al. Uterine torsion with necrosis of bilateral adnexa in a postmenopausal woman. *BMJ Case Rep*. 2019 Jun 18;12(6): e229311.



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