

INTRODUCTION

Dr. Arnold Kegel described Kegel exercises for PFM strengthening in 1948 and introduced these exercises as therapy for first time in 1970. Kegel exercises has been proved as a therapy to be applicable to routine postpartum PFM exercise, and has good effect in improving various urinary incontinence, vaginitis and puerperal symptoms. Pregnancy has stressful effect on female PF due to growing fetus and uterus, also due to increase pelvic ligaments, joints, muscles laxity under effect of pregnancy hormones. Vaginal delivery has traumatic effect on female PF, especially during second stage of labor when the fetal head cause extensive stretching of levator musculature and somatic nerves which in some cases causing permanent damage and these females start to complaint of signs and symptoms of PFD. TPUS is effective, easy, noninvasive, low-cost method for real time assessment of the PF function and anatomy so used to confirm the diagnosis of PFD. It is also very helpful in biofeedback training. Practicing Kegel exercises under supervision has better outcomes of PF function, including improvement of quality of life, decreasing urine leakage, and higher satisfaction rate compared to the unsupervised Kegel exercises.

AIM OF THE WORK

The aim of this study was to evaluate the efficacy of TPUS visual feedback for participants performing Kegel exercises on PFM function.

PATIENTS AND METHODS

This prospective randomized controlled study was conducted on 70 primiparous women who undergo normal full term singleton vaginal delivery and were indicated for postpartum Kegel exercise. All participants were subjected to complete history taking, complete general, abdominal and TVUS pelvic examination. All participants received Kegel exercise health education, verbal instructions, pamphlet aids in addition to initial and final (after 6 weeks Kegel exercise home training) 3D/4D TPUS assessment of levator hiatus midsagittal anteroposterior diameter, axial anteroposterior diameter, axial transverse diameter and levator hiatus area at rest,

during pelvic floor muscle contraction, and during the Valsalva maneuver at the ultrasound unit of El-Shatby Hospital in Alexandria. The participants were randomly allocated into two groups: group (A) 35 participants received TPUS visual feedback supervised Kegel exercise training and group (B) 35 participants didn't receive TPUS visual feedback supervised Kegel exercise training.

RESULTS

Table (1) shows,pre-post exercislevator hiatus measurement difference (cm) at rest and during valsalva between study groups: At rest,

The average change in midsagittal AP diameter was -0.17 ± 0.2 cm for Group A and -0.16 ± 0.22 cm for Group B (p-value: 0.9370), The average change in axial AP diameter was -0.16 ± 0.18 cm for Group A and -0.14 ± 0.15 cm for Group B (p-value: 0.5450), The average change in axial transverse diameter was -0.1 ± 0.13 cm for Group A and -0.06 ± 0.11 cm for Group B (p-value: 0.1401), The average change in axial LH area was -0.88 ± 0.92 cm for Group A and -0.63 ± 0.72 cm for Group B (p-value: 0.2059), During the Valsalva maneuver, The average change in midsagittal AP diameter was -0.13 ± 0.2 cm for Group A and -0.15 ± 0.21 cm for Group B (p-value: 0.6956), The average change in axial AP diameter was -0.14 ± 0.15 cm for Group A and -0.16 ± 0.15 cm for Group B (p-value: 0.5908), The average change in axial transverse diameter was -0.1 ± 0.16 cm for Group A and -0.07 ± 0.06 cm for Group B (p-value: 0.2504), The average change in axial LH area was -0.9 ± 0.95 cm for Group A and -0.8 ± 0.64 cm for Group B (p-value: 0.5928).

Table1: Comparing pre-post exercise levator hiatus measurement difference (cm) at rest and during valsalva between study groups

At rest	Group		
levator hiatus measurements	Group A (N: 35)	Group B (N: 35)	p-value
Delta Midsagittal AP diameter	-0.17 ± 0.2	-0.16 ± 0.22	t: 0.9370
Delta Axial AP diameter	-0.16 ± 0.18	-0.14 ± 0.15	t: 0.5450
Delta Axial Transverse diameter	-0.1 ± 0.13	-0.06 ± 0.11	t: 0.1401
Delta Axial LH area	-0.88 ± 0.92	-0.63 ± 0.72	t: 0.2059
Valsalva maneuver	Group		
levator hiatus measurements	Group A (N: 35)	Group B (N: 35)	p-value
Delta Midsagittal AP diameter	-0.13 ± 0.2	-0.15 ± 0.21	t: 0.6956
Delta Axial AP diameter	-0.14 ± 0.15	-0.16 ± 0.15	t: 0.5908
Delta Axial Transverse diameter	-0.1 ± 0.16	-0.07 ± 0.06	t: 0.2504
Delta Axial LH area	-0.9 ± 0.95	-0.8 ± 0.64	t: 0.5928
$\alpha = 0.05$. $p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$			
P-values obtained from two-sample t-test (t) or Mann-Whitney test (U)			

Table (2) shows that,

The average age was 21.1 ± 2.2 years for the group A and 20.6 ± 2.3 years for group B (p-value: 0.3698).

The average BMI was 24.9 ± 2.2 kg/m² for the group A and 24.7 ± 2.5 kg/m² for group B (p-value: 0.7192). :

Table2: Comparing age and BMI between study groups

		Group		
Term	Overall	Group A (N: 35)	Group B (N: 35)	p-value
Age (years)	Avg \pm SD 20.8 \pm 2.2	21.1 \pm 2.2	20.6 \pm 2.3	t: 0.3698
BMI (kg/m2)	Avg \pm SD 24.8 \pm 2.3	24.9 \pm 2.2	24.7 \pm 2.5	t: 0.7192
$\alpha = 0.05$. $p < 0.05^*$, $p < 0.01^{**}$, $p < 0.001^{***}$				
P-values obtained from two-sample t-test (t) or Mann-Whitney test (U)				

CONCLUSION

Considering the current findings, we can conclude that TPUS is an effective, easy, noninvasive, low-cost method for real time assessment of the PF function and anatomy so should be used to confirm the diagnosis of postpartum PFD. Health education, verbal instructions, pamphlet aids are sufficient enough to educate the un complicated vaginally delivered primiparous females with no PFD complains about routine postpartum Kegel exercises. Postpartum Kegel exercises regular daily training for 6-12 weeks improve hiatal area dimensions.