588

Abdool Z[1], Dietz H P[2], Lindeque G[3]
1. *University of Pretoria,Steve Biko Academic Hospital,Pretoria,South Africa,* ***2.*** *Sydney Medical School Nepean, Nepean Hospital, Penrith Australia,* ***3.*** *University of Pretoria, Steve Biko Academic Hospital,Pretoria, South Africa*

PELVIC FLOOR BIOMETRY: ARE THERE ETHNIC DIFFERENCES?

Hypothesis / aims of study

The aetiology of pelvic organ dysfunction is thought to be multifactorial, and ethnic differences in pelvic floor functional anatomy have been suggested as a significant factor (1,2). The aim of this study was to investigate baseline pelvic floor morphometry using three dimensional (3D) transperineal ultrasound (TPUS) and explore ethnic differences between three groups of asymptomatic nulliparous asian, black and white caucasian South African women.

Study design, materials and methods

Nulliparous females presenting for a routine gynaecological evaluation and volunteers from a local nursing school were invited to participate in this study. After informed consent, a clinical examination for POP using the pelvic organ prolapse quantification system (POP-Q) and modified Oxford score (MOS) was performed. All patients underwent a 3/4D TPUS examination in the supine position and after bladder emptying. Volumes were acquired at rest, contraction and Valsalva using a GE Voluson i ultrasound system with RAB 4-8 MHz transducer. Biometric parameters were analysed offline using the proprietary software 4D View on a desktop PC. DWT was assessed in the sagittal plane using 2 dimensional ultrasound, hiatal diameter and area were assessed at the plane of minimal hiatal dimensions. Statistical analysis was performed using SPSS version 22. Sample size calculations were not performed due to the absence of pilot data in the literature.

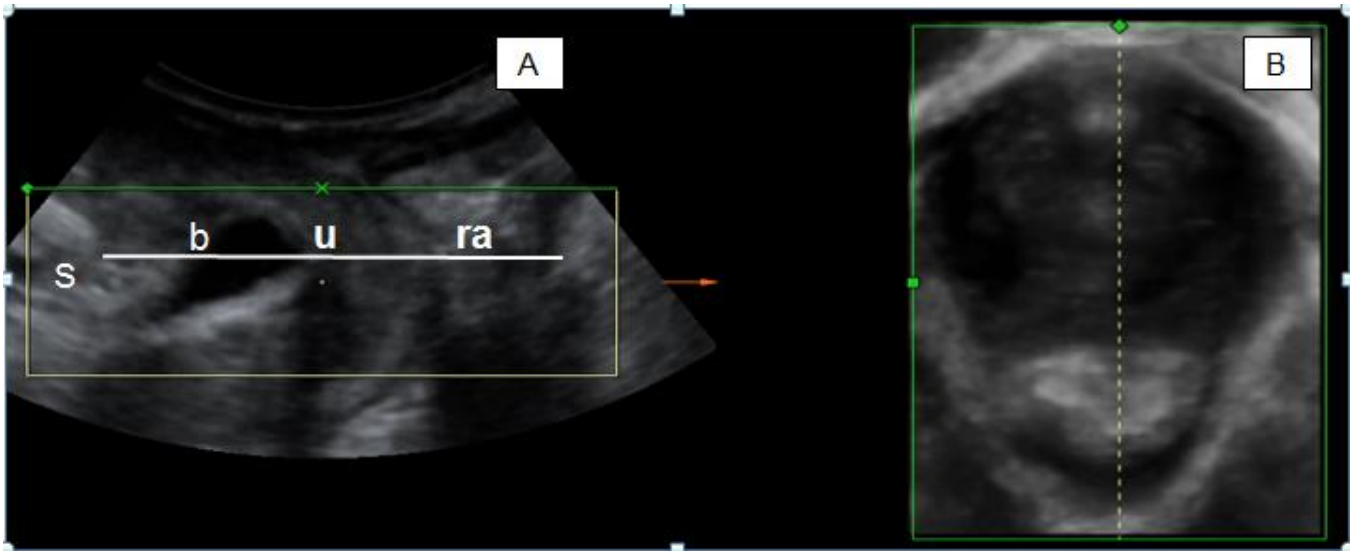

Figure 1: *Mid-sagittal translabial pelvic floor ultrasound (A) indicating pelvic organ descent on maximum valsalva and the corresponding axial view for determination of hiatal dimensions (B)*. S=pubic symphysis, b=bladder, u=uterus, ra=rectal ampulla

Results

A total of 177 women were recruited. One dataset was excluded due to poor image quality leaving data from 176 for the analysis. Due to a data acquisition error, organ descent could however only be determined in 135 women. All were asymptomatic for POP and/or urinary incontinence, and none had had previous treatment for symptoms of pelvic floor dysfunction. The mean age of the study group was 25 years (18-39).

Table 1 provides comparative data. The three groups varied for age and BMI, and black women produced stronger pelvic floor muscle contractions than the other groups. Bladder neck descent (p=0.04) and mean levator hiatal measurements at rest, maximum pelvic floor contraction and valsalva maneuver were all higher in black nulliparae (all p< 0.001). This also was the case for descent of all three compartments on Valsalva. On multivariate modelling black ethnicity and BMI remained a significant predictor for pelvic organ descent.

	Asians (n=31)	**Black (n=85)**	**Caucasians(n=60)**	**P value**
Age (years)	26.41 (4.94)	25.65 (4.56)	23.41 (4.21)	0.003
BMI	22.49 (4.8)	25.98 (4.84)	23.83 (4.25)	<0.001
Detrusor wall thickness (mm)	2.75(1)	2.64(0.9)	2.55(0.94)	0.64
Modified oxford score	3(0.76)	3.7(0.94)	3.43(0.96)	0.01
Hiatal area at rest (cm^2)	10.66 (3.53)	13.63 (3.34)	11.18 (2.54)	<0.001
Hiatal area on PFMC (cm^2)	9.08 (2.93)	10.67 (2.33)	9.20 (2.27)	<0.001
Hiatal area on Valsalva (cm^2)	14.13 (4.88)	18.06 (5.2)	14.82(4.84)	<0.001

Table 1: Pelvic floor biometry in South Asian, Black and White nulliparae (n=176)

	Asian n=(26)	Black (n=60)	Caucasian (n=49)	P value
Bladder descent (mm)	15.62 (4.18)	12.73 (5.59)	16.32 (5.68)	<0.001
Uterine descent (mm)	25.06 (5.71)	20.73 (7.35)	27.34 (6.66)	<0.001
Rectal descent (mm)	9.6 (3.71)	3.5 (7.79)	10.54 (4.13)	<0.001

Table 2: Pelvic organ descent in South Asian, Black and White nulliparae (n=135)

Interpretation of results

In this comparative study of three different ethnic cohorts, black nulliparous females were found to have greater levator hiatal dimensions and higher pelvic organ descent than Asians and white Caucasians, suggesting differences in the biomechanical properties of pelvic support structures.

Concluding message

There are significant differences in functional pelvic floor anatomy between South Asians, Blacks and White Caucasians.

References

1. Sewell CA,Chang E,Sultana CJ.Prevalence of genital prolapse in 3 ethnic groups.J Reprod Med.2007;52(9):769-773
2. Cheung RY,Shek KL,Chan SS, Chung TK, Dietz HP. Pelvic floor biometry and pelvic organ mobility in East Asian and Caucasian nulliparae

Disclosures

Funding: none **Clinical Trial:** Yes **Registration Number:** NHREC, 226/2011 **RCT:** No **Subjects:** HUMAN **Ethics Committee:** University of Pretoria research ethics committee **Helsinki:** Yes **Informed Consent:** Yes