Racial differences in the bony pelvis and pelvic soft tissues of primiparous women

Vicki L. Handa and Mark E. Lockhart for the Pelvic Floor Disorders Network

PURPOSE

To compare the dimensions of the bony pelvis and soft tissue structures in a large sample of African-American and white primiparous women, using static and dynamic magnetic resonance images (MRI).

METHOD AND MATERIALS

This study used data from the Childbirth and Pelvic Symptoms Imaging Study, including 104 primiparous women with an obstetrical anal sphincter tear, 94 who delivered vaginally without a recognized anal sphincter tear, and 36 who delivered by cesarean without labor. Race was self-reported by each participant. At 6-12 months postpartum, rapid acquisition T2-weighted pelvic MRI were obtained in the sagittal, coronal, and axial planes. 9 bony and 11 soft tissue dimensions were measured and compared between white and African-American participants using analysis of variance, controlling for delivery cohort.

RESULTS

Participants included 178 white and 56 African-American women. The pelvic outlet in white women was significantly wider (mean intertuberous diameter 122.8±9.7mm vs. 118.1±8.9mm, $p<0.001$) and shallower (mean anteroposterior outlet 110.6±9.9mm vs. 117.1±11.8mm, $p<0.0001$) than in African-American women. The pelvic inlet was also wider for white women (106.8±6.8mm vs. 100.2±6.9mm, $p<0.0001$). The two groups did not differ with respect to the interspinous diameter, angle of the subpubic arch or the obstetrical conjugate. The levator hiatus was similar between African-American and white women (37.7±5.7mm vs. 38.2±5.4mm, $p=0.73$). Although differences in H-line and M-line were present, no consistent pattern was identified among the soft tissue measurements.

CONCLUSION

Bony pelvimetry using MRI differs between white and African-American women, with white women having a wider pelvic inlet, wider outlet and shallower anteroposterior outlet. In contrast, MRI soft tissue dimensions were similar between these two groups.

Grant Number 2U01 HD41249, 2U10 HD41250, 2U10 HD41261, 2U10 HD41267, 1U10 HD41248, 1U10 HD41263, 1U10 HD41268, 1U10 HD41269

Clinical relevance:
Racial differences exist in pelvic bony architecture. These differences may contribute to racial differences in obstetrical outcomes and/or development of pelvic floor disorders.