OBJECTIVE

We investigated the structural differences in the pelvic bone architecture of Korean women and their association with the mode of delivery by performing computed tomography (CT) pelvimetry.

METHODS

This study was conducted on 175 women who underwent CT between March of 2006 and May of 2008. For making an objective assessment, one specialist in obstetrics and gynecology measured the obstetrical conjugate, the true conjugate and the diagonal conjugate on the sagittal plane and the transverse diameter, the intertuberous diameter and the interspinous diameter on the coronal plane. The patients who underwent total hysterectomy or those who had a disease of the uterus were excluded from the current analysis.

RESULTS

A total of 175 Korean women were examined, and their ages ranged from 20 to 50 years. The mean age was 37.6 ± 7.4 years. The interspinous diameter that was measured on CT scans was 94.6 ± 7.8 mm in the vaginal delivery group (n=84) and this was 90.9 ± 6.6 mm in the cesarean section group (n=20). This difference reached statistical significance.

CONCLUSION

Our study examined the difference in the pelvic architecture with using CT and we found that the interspinous diameter can be the important determinant that affects normal vaginal delivery. Of these pelvimetric parameters, a wider interspinous diameter was significantly associated with vaginal delivery. Multi-disciplinary approaches are warranted to examine this relation with regard to the various factors that are involved in delivery.

Keywords: Interspinous diameter, Obstetrical conjugate, True conjugate

The maternal bony pelvis is an important factor that affects the degree of soft tissue damage that occurs during parturition and for choosing the mode of delivery [1]. It is known that such factors as a spacious inlet, a large interspinous diameter and a wide suprapubic arch are associated with a normal vaginal delivery [1]. Childbirth is a major cause of pelvic prolapse, and so conducting anatomical studies on the maternal pelvic structure are essential for examining the structural changes of the pelvic bone that occur during parturition and the possible subsequent prolapse of organs in the pelvic floor. However, there have been no such studies due to a lack of measurement methods in this field. Recent studies [2-4] have found that computed tomography (CT) pelvimetry is easier to perform and more accurate and it causes less distortion than does the conventional x-ray technique. The purposes of the current study are to examine the bony pelvis dimensions in Korean women and their association with the mode of delivery by computed tomography.
women by using CT pelvimetry and to identify its association with the mode of delivery.

**Materials and Methods**

The current study was conducted on 175 patients who underwent pelvic CT between March of 2006 and May of 2008. These patients’ medical records were retrospectively reviewed and the following data was evaluated: age, parity, height, weight, and the mode of delivery. The study was approved by the local ethics committee of the university and conducted in accordance with the ethical standards for human research established by the Declaration of Helsinki. Written informed consents were obtained.

The pelvimetry studies were done with a CT scanner (Siemens Medical Systems Inc., Madison, WI, USA) as described by Federle et al. [2] All the CT measurements were made by one gynecologist. Six pelvic dimensions were measured for each woman. The obstetrically important anteroposterior diameter is the shortest distance between the promontory of the sacrum and the symphysis pubis, and this is designated the obstetrical conjugate. The anteroposterior diameter of the pelvic inlet has been identified as the true conjugate between the promontory of the sacrum and the symphysis pubis. The diagonal conjugate was determined by measuring the distance from the lower margin of the symphysis to the promontory of the sacrum (Fig. 1). The transverse diameter of the pelvic inlet was measured on the anteroposterior radiograph and this was defined as the maximum transverse distance of the pelvic outlet (Fig. 2). The interspinous diameter of the midpelvis was measured on the axial radiograph and this was defined as the distance between the ischial spines (Fig. 2). The intertuberous diameter of the pelvic outlet was measured on the anteroposterior radiograph and this was defined as the distance between the inner aspects of the ischial tuberosities (Fig. 2). The pelvimetries and measurements were performed on the radiographs by using electronic calipers with an internal scale. The paired t-test was used for statistical analysis and P-values <0.05 were considered to be statistically significant.

**Results**

A total of 175 Korean women were examined, and their ages ranged from 20 to 50 years. The mean age was 37.6 ± 7.4 years. Of them, 84 patients had vaginal delivery and 20 underwent cesarean operations (The indication of cesarean section was cephalopelvic disproportion). On the CT scans, a total of 175 patients had a true conjugate of 125.0 ± 9.0 mm, an obstetrical conjugate of 119.7 ± 9.5 mm, a diagonal conjugate of 133.5 ± 10.0 mm, an interspinous diameter of 94.0 ± 7.2 mm, an intertuberous diameter of 97.7 ± 10.1 mm and a transverse diameter of 124.8 ± 6.3 mm. The interspinous diameter, which was measured on the CT scans,

---

**Fig. 1.** Sagittal pelvis CT. (A) true conjugate, (B) obstetric conjugate, (C) diagonal conjugate.

**Fig. 2.** Coronal pelvis CT. (A) transverse diameter (B) interspinous diameter. (C) intertuberous diameter.