

## Pelvic Types as Seen in a Tropical Setting

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**Abstract**

**Background:** Cephalo pelvic disproportion is still the leading indication for caesarean section in many developing countries and the contribution of pelvic typology may play some role in this regard. Our objective is to determine the proportion of pelvic types as seen in a tropical setting.

**Method:** A retrospective review of preliminary films of hysterosalpingography of 400 women who underwent the study between January 2000 and December 2007 was reviewed to determine the pelvic typology.

**Result:** Of the 400 films reviewed, 361 (90.3%) were gynaecoid, 36 (9%) were android and 3 (0.8%) were andropoid. There was no platypelloid pelvis seen in the films reviewed and a mixed type pattern was not observed in this study.

**Conclusion:** The proportion of pure gynaecoid pelvis seen in this review is about the highest reported in the literature.

**Key Words:** Pelvic type, preliminary film

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**Introduction**

Anatomical descriptions of the pelvis in midwifery texts first appeared in the 18th century.<sup>1</sup> The records of the 18th century “man-midwives” revealed the impact of rachitic and osteomalactic pelvis on obstetric outcome.<sup>2</sup> Though these problems are now less common because of improved nutrition; it's still seen in some populations till today.<sup>3</sup> Radiographic pelvimetry is no longer popular in contemporary obstetric practice.<sup>4</sup> However, clinical pelvimetry though unreliable as a measure of successful vaginal delivery is routinely performed during labour. Knowledge of pelvic typology is helpful in prognostication of progress of labour with early intervention when necessary.

Pelvic abnormalities have been shown to be associated with increased operative deliveries.<sup>5</sup> Early pelvic typologies were based on racial difference not until the anthropologist developed the concept of the obstetrical dilemma, although much of the variations in pelvic shape were documented more by the obstetrician and the midwife than the anthropologist.<sup>6</sup> The classification of pelvic typology was facilitated by the introduction of X-ray pelvimetry but were bedeviled by the racial typologies developed from the osteological collections of physical anthropologist of the early 20th century.

There are four “pure” pelvic types –gynaecoid, android, andropoid and platypelloid. Most people usually have a mixture of types<sup>7</sup>, however it should be noted that most studies on pelvic types from where these traditional types were coined were carried out on Caucasians in the earlier literature, specifically derived from 19th and early 20th- century racial topologies<sup>6</sup> and not in a tropical setting. The size and shape of the pelvis reflects physical appearance of a woman with the shapely and curvy likely to have a gynaecoid pelvis and those with “flat rear ends” likely to have the android type. Those with “larger rear ends” are likely to have the andropoid type<sup>8</sup>. Round, oval, triangular, and flat relate to the Latin names; gynaecoid, andropoid, android and platypelloid respectively. The gynaecoid pelvis is considered the most favourable for child birth.<sup>6,9</sup>

The gynaecoid and andropoid types are commoner in black women<sup>7,9</sup>. The android and andropoid pelvis are associated with deep transverse arrest and occipito posterior positions both of which could lead to dystocia with increased risk of operative delivery.<sup>6,7</sup> But unlike the andropoid pelvis, those with the android variety tend to be tall with correspondingly large pelvis which facilitates easy childbirth<sup>10</sup>.

Because many of the studies on pelvic types were done in Caucasians, this study aims to determine the proportion of pelvic types in a tropical setting and compare our findings with earlier studies.

### Materials and Methods

The University of Maiduguri Teaching Hospital is the only Teaching hospital in the north eastern region and serves the entire population of Borno state and even neighbouring Cameroon, Chad and Niger.

Plain pelvic radiographs of all women who had hysterosalpingography between January 2000 and December 2007 were reviewed for pelvic typology. The pelvic types were classified as gynaecoid, android and andropoid based on the measurement of the greatest transverse diameter and its division into anterior and posterior segments. The character of the posterior segment determined the pelvic type<sup>7</sup>. The anterior-posterior diameter was measured from the tip of the sacral promontory to the upper border of the most bulging part of the pubic symphysis on the frontal radiographs reviewed while the transverse diameter was measured between the furthest 2 points on the ileopectineal line. Pelvis with wide sacrum, concave and inclined, wide sacroiliac notch and oval inlet were classified as gynaecoid while the pelvis with a triangular inlet/heart shaped with ischial spines projecting into the pelvic cavity were classified as android. The andropoid pelvis has a long anterior posterior diameter with short transverse diameter. These pelvic types are defined not only by their absolute dimensions, but also by their overall shape and by a characterization of their anterior and posterior segments.<sup>9</sup> Numbers and frequencies were analyzed using SPSS version 13.0.

### Results

The age distribution is depicted on Table 1. The majority 328(82%) of those subjected to hysterosalpingography were less than 35 years of age. Of the 400 films reviewed 361(90.3%) were gynaecoid, 36 (9%) were android and 3 (0.8%) were andropoid. There was no platypelloid pelvis seen in the films studied and a mixed type pattern was not observed as shown on Table 2.

**Table I: Age Distribution**

Age	Frequency	Percentage
15-24	110	27.5
25-34	218	54.5
≥35	72	18.0
<b>Total</b>	<b>400</b>	<b>100</b>

**Table II: Distribution of Pelvic Types**

Pelvic type	Frequency	percentage
Gynaecoid	361	90.3
Android	36	9.0
Andropoid	3	0.8
<b>Total</b>	<b>400</b>	<b>100</b>

### Discussion

The development of X-ray pelvimetry in the 1920s facilitated an entirely new view of the pelvic anatomy and before the dangers of radiation were discovered, antenatal pelvimetry was a common practice.<sup>11</sup> Greulich and Thoms<sup>12</sup> classified the pelvis into four types based on ratios between the transverse and sagittal diameters of the inlet in order of decreasing sagittal diameter as dolichopellic, mesatipellic, brachypellic and platypellic. The most enduring of the pelvic type classification is however that of Caldwell and Moly.<sup>11</sup> Their system defined the four basic types based on the shape of the inlet: gynaecoid, android, andropoid and platypelloid.

Caldwell and Moloy<sup>11</sup> posited that the gynaecoid pelvis which was found in over 90% of women in this study is ideally suited to childbirth. Since patients coming for hysterosalpingography do not select themselves for the procedure, the pelvic types observed in this study are likely a good reflection of the pelvic typology in this environment. With gynaecoid pelvis the commonest in this study and cephalopelvic disproportion the leading indication for caesarean section in this environment;<sup>13,14,15</sup> its probable that poor nutrition and inter current infections affect pelvic growth. Prognosis for childbirth is poor in women with android pelvis except if the subpubic angle is wide<sup>6,10</sup>.

Turner's racialized classification of pelvic type and the description of andropoid pelvic type frequent among non-Europeans as representing the "degraded and animalized arrangement seen in the lower races" is in sharp contrast to the findings in this study<sup>6</sup>.

The andropoid pelvis which other studies have shown as commoner in "non Europeans" was the least pelvic type seen in this study constitute only 0.8%<sup>6</sup>. Early studies on pelvic type link "animal" with "nonwhite" and "human" with "white" and suggest that the "animal-like" andropoid pelvis is linked with relative ease of birth while the "ultra-human" and white are linked with birthing difficulties.<sup>6</sup> Writing in the Washington post<sup>15</sup> Carol Garvey said that "the average pelvis in a black woman is less favourable to an easy birth".

In defending her, Margolis, in the Washington post quoted the 14th edition of Williams obstetric to defend that andropoid pelvis is found in 40.5% of non white and that Carols statement was not far from the truth.

Our finding showed that the majority (90.3%) had the ideal pelvis for childbirth with only 0.8% having the andropoid pelvis which is less suitable for childbirth compared with the gynaecoid pelvis. This suggest that the cause of difficult labour in black women may not be the pelvic type but probably poor development of the pelvic bone as most of women in this study have the ideal pelvis for childbirth<sup>7</sup>. Dietary, overall health, posture and activity level are said to contribute to pelvic morphologies in adult female.<sup>18</sup> In keeping with Caldwell and Moloy<sup>11</sup>; Caldwell, Moloy and D' Esopo<sup>18</sup> the gynaecoid pelvis was also the commonest in this study. Caldwell and Moloy<sup>11</sup> reported that the gynaecoid pelvis was found in almost 50% of women.<sup>7</sup>

The android and the andropoid pelvis constitute the most significant factors thought to be associated with occiput posterior positions and each of the pelvic types have specific pattern of fetal presentation and descent with corresponding forceps manipulation.<sup>19</sup> Anecdotal evidence suggests that posterior presentations may be far more common in some non-western populations than they are in the United States and western Europe.

If posterior presentations are commoner with the android and the andropoid pelvis then it should be an uncommon occurrence in our environment based on the rarity of these pelvic typologies. Pure varieties of the pelvic type have been reported in fewer than 3% of women.<sup>7</sup> In contrast, no film was reported as mixed type in the 400 preliminary films reviewed in this study. In conclusion, our findings suggest that the pelvic typology seen in the tropics is in sharp contrast to that reported from the western world.

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