Shoe size and other anthropometric variables among women who had normal labour in Abakaliki, south-east Nigeria

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Abstract

Objective: To assess the anthropometric variables of women who had normal labour and to document the relationship between shoe size and other anthropometric variables.
Methods: This was a cross-sectional study conducted among 307 women who had normal labour at Mile 4 Hospital, Abakaliki, between January 2013 and January 2015. Information on sociodemographic characteristics was obtained. Shoe sizes were measured using the Genuine Brannock Device. The relationship between the shoe size and other variables were assessed using linear regression models.
Results: Their mean age was 27.7 + 3.7 years. The mean height was 1.58 + 0.35 and mean weight was 65.37 + 10.31kg. The mean waist circumference of the study population was 37.19 + 3.34cm. The mean chest circumference of the subjects was 37.75 + 3.10cm. Their mean shoe size was 7.86 + 1.26. There was a positive correlation between shoe size and other anthropometric variables.
Conclusion: This study showed a positive correlation between shoe size and other anthropometric variables (height, weight, chest circumference and waist circumference) among women who had normal labour. Hence shoe size may be a useful predictor for normal labour.

Keywords: Shoe size, height, weight, waist circumference, chest circumference.

Introduction

A normal labour is the dream of every pregnant woman. This is at times not achievable as some women end up with major interventions and complications during labour, while some others are associated with maternal mortality. Several factors may determine labour outcomes, including maternal anthropometric variables.

Maternal shoe size has previously been used to predict pelvic disproportion.[1] Shoe size measurement is quite simple. It can be done without sophisticated materials during routine antenatal clinic visit. Despite its acclaimed usefulness, it is not routinely measured during antenatal period in our

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setting. Increasing shoe size has been associated with a decreased caesarean section rate.1 There is also a correlation between height and foot size.[2] Though there are other accurate methods to predict labour outcomes in modern obstetrics, shoe size measurement may be useful in low resource settings.

Even if maternal shoe size may not be used to determine whether or not to do caesarean section, it may be used as a guide for patient referral. During the antenatal clinic, women with unfavourable shoe size may be referred to facilities that offer Emergency Obstetric Care. Shoe size correlation with other anthropometric variable will mean that even in the absence of these variables, the shoe size of women in labour will be a useful guide to the possible course of labour. Determining the anthropometric variables of women in our setting will be a useful guide in predicting labour outcome and also serve as a future reference material.

Anthropometry, which is the traditional tool of physical anthropology provides objective and scientific techniques for estimating the various measurement both on the living and skeleton of the dead.[3,4]

The aim of this study was to assess the anthropometric variables of women who had normal labour and to document the relationship between shoe size and other anthropometric variables (height, weight, waist circumference and chest circumference).

Materials and Methods

This was a cross-sectional study conducted among 307 women who had normal labour at Mile 4 Hospital, Abakaliki, between January 2013 and January 2015. Mile 4 Hospital is a missionary specialist health facility dedicated to management of labour, delivery and the paediatric illnesses. Information on sociodemographic characteristics was obtained. Shoe sizes were measured using the Genuine Brannock Device. Other anthropometric variables such as height, weight, waist circumference and chest circumference were also obtained. The relationship between the shoe size and other variables were assessed using linear regression models. A total of 307 women who had normal vaginal delivery were involved in this study. Voluntary informed consent was obtained from the study participants. Women that refused to give consent were excluded from the study. Ethical clearance was obtained from the institutions Ethical Committee.

Results

Their mean age was 27.7 + 3.7 years. A hundred and seventy-four (56.7%) of the women were between the ages of 25 and 29 (Table 1) and their parity ranged mostly from 1 to 4 (88.6%). Their mean height was 1.58 + 0.35 meters and mean weight was 65.37 + 10.31kg. The mean waist circumference of the subjects was 37.19 + 3.34cm. The mean chest circumference of the subjects was 37.75 + 3.10cm. Their mean shoe size was 7.86 + 1.26. There was a positive correlation between height and shoe size (r = 0.02, p = 0.014457), weight and shoe size (r = 0.14, p < 0.000001), waist circumference and shoe size (r = 0.11, p < 0.000001) and chest circumference and shoe size (r = 0.07, p = 0.000002).

Discussion

Anthropometric variables of a given population are important partly because it may be used to measure certain health parameters. Use of normal maternal shoe size as a predictor of labour outcome is relatively inexpensive. The main findings of this study are the shoe sizes of women who had normal labour and that there were positive correlations between shoe size and height, weight, waist circumference and chest circumference.

The mean shoe size of women who had normal labour was 7.86 and their mean height was 1.58m. These anthropometric variables may be able to predict labour outcome. During antenatal assessment, these variables can easily be measured without sophisticated equipments. Following measurement, women may then be advised on where it may be appropriate for them to give birth. This will usually be in a setting with facilities for emergency obstetric care. When these parameters are adequate, an uneventful labour may be expected. In a study done in Inverness the mean height of women that had vaginal delivery was more than those who has caesarean section.[5] In another study, maternal statue less than 150 cm was not associated with increased risk for caesarean section on account of cephalopelvic disproportion.[6] In another study, there was no relationship between small shoe size and caesarean section delivery.[7] Increasing shoe size was associated with a decreased caesarean section rate in another study.[1]

In this study, shoe size showed a positive correlation between height, weight, waist circumference and chest circumference. In a study done in Mumbai to determine the correlation between height and foot length, there was a significant association between both and the height of an individual was 6.5 times her foot length.[8] A statistically significant correlation between height and foot length was recorded in another study.[9]

In a study done in Turkey, to determine the relationship between foot length, foot breadth, ball girth or foot circumference, height and weight of students aged between 17 and 25, it was noted that in both sexes the correlation between foot length and height was more significant than the correlation between foot length and weight.[10]

Table 1: Sociodemographic indices

Variable	Frequency (%)
Age	
<20	**2 (0.7)**
20 – 24	**48 (15.6)**
25 – 29	**174 (56.7)**
30 – 34	**73 (23.8)**
35 – 39	**9 (2.9)**
40 – 44	**1 (0.3)**
Parity	
1 – 4	**278 (90.6)**
> 4	**29 (9.4)**
Occupation	
Trading	**69 (22.47)**
Farming	**26 (8.47)**
Civil servant	**92 (29.97)**
Student	**24 (7.82)**
House wife	**68 (22.15%)**
Professional	**2 (0.65)**
Seamstress	**26(8.47)**
Level of Education	
Primary	**37 (12)**
Secondary	**178 (58)**
Tertiary	**86 (28)**
No Formal Education	**6 (2)**
Marital Status	
Married	**300 (97.7%)**
Single	**1 (0.3)**
Widow	**3 (1)**
Divorced	**3 (1)**

Table 2: Duration of labour

Duration	Frequency (%)
< 12 hours	94 (30.6)
1 day	127 (41.4)
2 days	70 (22.8)
3 days	13 (4.2)
> 3 days	3 (1)

Table 3: Shoe sizes of the study participants

Foot length	Frequency (%)
< 4	1 (0.33)
4 – 5.9	11 (3.58)
6 – 7.9	140 (45.6)
8 – 9.9	130 (42.35)
10 – 11.9	25 (8.14)

Table 4: Height of the study participants

Height(meters)	Frequency (%)
< 1.50	40 (13)
1.50 – 1.59	180 (58.6)
1.60 – 1.69	73 (23.8)
1.70 – 1.79	14 (4.6)

Conclusion
This study has provided information regarding the expected anthropometric variables that are more likely to be associated with normal labour and delivery. These measurements may particularly be useful in low resource settings. It will serve as a useful guide for proper patient selection during the antenatal period. It will also serve as a tool for comparison with regards to future research.

Conflicts of Interest
None

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