

## Original Article

## COMPARISON OF SHOE SIZES OF WOMEN WITH NORMAL LABOUR AND THOSE WHO DEVELOPED VESICOVAGINAL FISTULA

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### Abstract

**Background:** Anthropometric variables such as height and shoe size have previously been used to determine labour outcomes. These variables may be used to predict the occurrence of obstructed labour which is the major cause of vesicovaginal fistula (VVF). These measurements are relatively cheap to get and can be easily assessed during routine antenatal clinic visits.

**Objective:** To compare the shoe size of women who had normal labour and those that developed vesicovaginal fistula.

**Materials and Method:** This was a descriptive comparative study conducted between January 2014 and January 2015 at the National Obstetric Fistula Centre involving 170 women who developed VVF as cases and 170 women who underwent normal labour as the control group. Shoe sizes of the subjects were determined using the Genuine Brannock Device. Mean of numerical variables were compared using Student t test. Statistical significance was p-value <0.05.

**Results:** The mean age of women in the VVF group was 33.45±8.51 years while that of the control was 27.85±2.93 years. The mean height of women in the VVF group was 1.5±0.1m while that of the control was 1.6±0.1m. The mean shoe size of women in the VVF group was 6.5±1.4 while that of control was 7.9±1.2. The differences in shoe size of the two groups were found to be statistically significant.

**Conclusion:** This study shows that women who developed VVF have significantly smaller shoe size compared to those who had normal labour and delivery.

**Keywords:** Shoe size, Normal labour, Vesicovaginal fistula.

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### INTRODUCTION

Anthropometric variables have previously been used as determinants of labour outcomes.<sup>1</sup> These measurements can be taken during routine antenatal clinic visits. Based on these measurements, a difficult labour may be expected, which makes it necessary to refer a pregnant woman to a health facility with readily available emergency and quality obstetric services.

Vesicovaginal fistula is an abnormal communication between the vagina and the bladder and it has prolonged obstructed labour as its major cause.<sup>2,3</sup> It usually results in leakage of urine through the vagina. The affected women are usually devastated. Obstetric fistula is part of the obstructed

labour injury complex.<sup>4</sup> Poor anthropometric variables have a role to play in this complex and this may be a predictor for obstructed labour and subsequently, vesicovaginal fistula.

In a study, women with shoe size less than four and half were more likely to be delivered by Caesarean section compared to those with larger shoe sizes.<sup>5</sup> Cephalopelvic disproportion is usually an initial event in the pathogenesis of vesicovaginal fistula. In a study done using 563 white primigravid patients, the authors concluded that shoe size was not a useful clinical predictor for the probability of cephalopelvic disproportion and 80% of women less than 160 cm tall delivered vaginally.<sup>1</sup> The objective of this study was to

compare the shoe sizes of women with vesicovaginal fistula with those that had normal labour.

## MATERIALS AND METHODS

This was a descriptive comparative study conducted at the National Obstetric Fistula Centre and Mile 4 hospital, Abakaliki, Nigeria between January 2014 and January 2015. The fistula Centre provides free services to patients with genital fistula. It also has family planning services. There is an oncology unit for the management of premalignant and malignant lesions of the cervix in addition to the invitro fertilization unit. The study was among 170 women who had normal labour and 170 women who had vesicovaginal fistula. Patients that presented to our health facility for surgical repair of vesicovaginal fistula were recruited for the study. Other women who had normal labour in Mile 4 hospital, Abakaliki formed the control group. All patients that gave consent during the study period were included in the study. Those that had a diagnosis of vesicovaginal fistula following examination in theatre were included in the study group. Patients were assured of confidentiality at all times. Refusal to be part of this study did not influence patient management in any way. Ethical approval was obtained from the Ethics and Research Committee of the National Obstetric Fistula Centre and Mile 4 hospital, Abakaliki, Nigeria. Data was analysed using statistical methods, SPSS version 21.

## RESULTS

The mean age of women in the VVF group was  $33.45 \pm 8.51$  years while that of the control was  $27.85 \pm 2.93$  years. Women aged 25 – 29 years were more compared to other age groups (Table 1). The mean height of women in the VVF group was  $1.5 \pm 0.1$ m while that of the control was  $1.6 \pm 0.1$ m. There was a statistically significant difference between the height of the two groups as those that had normal labour were more likely to be taller (P-value < 0.007, t = 2.739).

**Table 1: Age group of the study population**

Age	VVF group (%)	Control group (%)
< 20	2 (1.2)	0(0)
20 – 24	19(11.2)	16(9.4)
25 – 29	51 (30)	110(64.7)
30 – 34	31(18.2)	45(25.3)
35 – 39	22(12.9)	1(0.6)
40 – 44	13(7.6)	0(0)
> 44	32(18.8)	0(0)

The mean shoe size of women in the VVF group was  $6.5 \pm 1.4$  while that of control was  $7.9 \pm 1.2$ . This was found to be statistically significant (two-tailed P-value < 0.001, t = 9.472). The shoe size of women with vesicovaginal fistula ranged from 2.5 to 11 while that of the control group ranged from 5 to 11. Five (2.9%) of the women with vesicovaginal fistula had shoe size less than 4 while none of the women that had normal labour had shoe size less than 4 (Table 2). Fourteen (8.2%) of the women who had normal labour had shoe size greater than 10 while only 2 (1.2%) of the women with vesicovaginal fistula had shoe size greater than 10. Only 4 (2.4%) of women who had normal labour had shoe size of 5.9 and below.

**Table 2: Shoe sizes of the two groups**

Shoe size	VVF group (%)	Control group (%)
< 4	5 (2.9)	0 (0)
4 – 5.9	34 (20)	4 (2.4)
6 – 7.9	104 (61.2)	82 (48.2)
8 – 9.9	25 (14.7)	70 (41.2)
10 – 11.9	2 (1.2)	14 (8.2)

## DISCUSSION

The main finding of this study was that women who had vesicovaginal fistula were significantly more likely to have smaller shoe size than those that had normal labour. Those that had normal delivery were more likely to be taller than those that developed vesicovaginal fistula.

Shoe size has previously been used to predict labour outcome.<sup>1,5</sup> The finding of this study shows that women with smaller shoe size should be identified in the antenatal clinic and should be carefully monitored to prevent obstructed labour and resultant vesicovaginal fistula. Such women should not be allowed to labour in facilities that cannot offer comprehensive obstetric care. It is a cheap and reliable way of assessing pregnancy at risk of adverse outcome. In a study done to compare shoe size and cephalopelvic disproportions, 21% of women with shoe size less than four and half were delivered by Caesarean section while only 1 % of women with shoe size greater than six and a half had Caesarean section.<sup>5</sup> In our study, 2.9% of women with shoe size less than 4 had vesicovaginal fistula. One can compare these findings to our study since cephalopelvic disproportion resulting in obstructed labour is the main contributor to vesicovaginal

fistula in developing countries.<sup>6</sup> It may be deduced from that study that shoe size is a predictor of difficult labour and probably vesicovaginal fistula as seen in our study. Another study done among 563 women showed that shoe size was not a useful clinical predictor for the probability of cephalopelvic disproportion.<sup>1</sup>

In this study, there was a statistically significant difference between the height of women with normal labour and those that developed vesicovaginal fistula. Some authors have reported short stature as a risk factor for cephalopelvic disproportion and obstructed labour<sup>7,8</sup> which is usually the main cause of obstetric fistula. Hence, it is suspected that women with vesicovaginal fistula will be shorter than those that had normal labour. The taller a woman is, the more likely she is to have normal labour and her risk of developing vesicovaginal fistula is reduced.

In a study conducted to investigate the value of maternal height and foot length as predictors of pelvic adequacy, those that had normal vertex delivery were taller and had longer feet than patients who had Caesarean section.<sup>9</sup> A study was conducted in the United Kingdom to determine whether measurements of maternal height and shoe size are predictors of pelvic size using computerized tomography pelvimetry.<sup>10</sup> The study concluded that these variables are not useful predictors of inadequate pelvis. Relating such findings to our study will mean that shoe size may not predict occurrence of obstructed labour and probably vesicovaginal fistula.

This study has some limitations which should direct future research. Other anthropometric variables of women that had normal labour and those who developed vesicovaginal fistula were not within the scope of this study. Other variables which may contribute to vesicovaginal fistula that are not related to maternal factors such as iatrogenic fistula were not also considered in this study.

## CONCLUSION

This study was designed to assess the role of maternal shoe size in predicting the occurrence of vesicovaginal fistula. It showed that women who developed vesicovaginal fistula have significantly smaller shoe sizes compared to those who underwent normal labour.

## AUTHOR CONTRIBUTIONS

All authors contributed to the design, data collection and manuscript writing

## ETHICAL APPROVAL

This was obtained from the institutions ethical committee.

## CONFLICTS OF INTEREST

The authors did not declare any conflict of interest.

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