



Morphometric Study of Placenta of Fulani Parturients: A Study Conducted at Murtala Muhammed Specialist Hospital Kano, Nigeria

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Abstract

Morphometric studies on placentae were done elsewhere with few conducted on certain ethnic groups in Nigeria but to the best of our knowledge none was reported on Fulani ethnic group. The aim of the study is to determine the morphometry of placenta of Fulani ethnic group. The study is a prospective and descriptive type. A total of 383 term placentae of the Fulani ethnic group were examined and each was cleansed of blood clots and trimmed of umbilical cord near its point of attachment with the placenta and its weight, diameter and thickness were determined. The instruments used were the triple beam balance, meter ruler and the Vernier caliper. Placental outline, placental consistency, cotyledons and colour were observed and noted. The mean \pm SD for the placental weight and diameter were 470 ± 100 g and 19.5 ± 1.6 cm respectively, while the mean placental thickness was 1.9 ± 0.2 cm. The average number of placental cotyledons was found to be 20. Maroon colour, oval outline and normal consistency were the major findings. This study reports baseline anthropometric data of placentae of Fulani ethnic group in Kano which can be referred for reference by midwives, delivery physicians, obstetricians, neonatologists, paediatricians and anthropologist.

Keywords: Placenta, Morphometry, Fulani, Kano.

Introduction

Placenta as an interface between mother and the fetus plays a key role in fetal growth and development and, as such affects the fetal programming underlying subsequent adult health and accounts in part for the developmental origin of health and disease (DOHaD).^[1]

Examination of the placenta in delivery room provides information that may be important to the care of both the mother and the infant.^[2] The findings of the assessment should be documented in the delivery record. During the examination, the size, shape, weight, texture and completeness of the placenta should be determined and the presence of accessory lobes, nodules be noted.^[2] Very many common and uncommon findings of the placenta are associated with abnormal fetal development and prenatal mortality. At times placentae should even

be submitted for pathologic evaluation if an abnormality is detected or certain indications are present.^[2]

Most hospitals do not mandate the examination instead delivery physicians are usually responsible for determining when pathologic evaluation is necessary. Proper examination of the placenta by physicians has been overlooked and one hardly comes across standard delivery records, on placentae in delivery case notes.^[2]

Literature review has shown that most of the reference data on morphometry of placenta in Nigeria is driven from Caucasian assessment with few works done in Lagos, Enugu and Kano.^[3, 4, 5] There is paucity of local published data on morphometric measurements of placentae from

Fulani ethnic group in Nigeria. Hence, the purpose of this study is to provide local baseline reference morphometric data of placentae of Fulani Parturients.

Materials and Method

The study site was Department of Obstetrics and Gynaecology, Murtala Muhammad Specialist Hospital (MMSH) Kano, Nigeria. The hospital delivery record shows an average of 1000 deliveries per month (MMSH Record Unit). The study design was prospective, descriptive and observational. Institutional permission and clearance was obtained from Kano State Hospitals Management Board and MMSH, Kano. Parturient voluntary informed consent was obtained; anonymity and confidentiality were duly observed.

Morphometric Study of Placenta

A total of 383 term normally delivered placentae from Fulani Parturients were collected and examined for any pathological lesions. Each after birth was thoroughly cleansed of blood clots with the aid of blotting paper and the umbilical cord was trimmed

near its point of attachment with the placenta. Morphometry of the placentae was done (diameter, thickness, weight, number of cotyledons and placental outline). Placental diameter (cm) was calculated by metallic scale (1 m long, measuring to the nearest 1 milliliter, Model 00389A-1. Made in China) as mean of two diameters perpendicular with each other. [7, 8, 9] Placental thickness was taken as average of three point measurements with the aid of Vernier caliper along a line of incision through the diameter line of the placenta (central, middle and peripheral). [7,8,9] Placental weight (g) was determined with the aid of Triple beam balance (OHAUS, USA, Maximum capacity 2610g, minimum capacity 1.0mg). [8, 12, 13] Number of placental cotyledons to the best of our knowledge, is by visual identification of the cotyledons and simultaneous counting. This stands the risk of either under counting or over counting. In this study we improvised a technique that allowed us count each individual cotyledon by fixing it with coloured headed pins and thus clearly identified for counting, avoiding miss- counting or multiple counting. [14, 15, 16]



Plate 1: Photomicrograph Demonstrating the Counting of Placental Cotyledons

Placental shape was identified by measuring two diameters perpendicular with each other (equal diameter = circular, unequal = oval).

Other Non Measurable Parameters

Colour of the maternal surface of the placenta and its consistency (by palpation) were only observed and noted. [3]

Statistical Analysis

The data collected was analysed using MINITAB version P2 (U.S.A.). Mean and standard deviation were used to describe the data.

Results

In the study (Table 1) 34.98% was in age group 15-20 years. Parturients with maternal age greater than 35 years accounted for 5.48%.

Table 1: Demographics of Fulani Ethnic Group

Age Group (in years)	N (%)
15-20	134 (34.98)
21-25	96 (25.06)
26-30	92 (24.02)
31-35	40 (10.44)
>35	21 (5.48)
	383 (100)

77 (20.10%) sampled placentae were from primiparous and 306 (79.9%) multiparous Fulani Parturients (Table 2).

Table 2: Sampling of Placenta Based on parity and Mode of Labour

Parity/Mode of Labour	Fulani Parturients N=383 (%)
Parity	
Primipara	77 (20.10)
Multipara	306 (79.9)
Mode of Labour	
Vaginal	383 (100)
Assisted Delivery	0 (0)
Caesarian Section	0 (0)

The mean placental diameter, mean placental thickness, mean placental weight and mean number of placental cotyledons for Fulani parturients were 19.5 ± 1.6 cm, 1.9 ± 0.2 cm, 470 ± 100 g and 20 (Table 3)

Table 3: Placental Morphometry amongst Fulani Ethnic Group

Variable	Fulani N = 383 Mean \pm SD
Mean Placental Diameter (MPD) cm	19.5 ± 1.6
Mean Placental Thickness (MPT) cm	1.9 ± 0.2
Mean Placental Weight (MPW) g	470 ± 100
Mean no. of Placental Cotyledons (MPC)	20

The shape of placental outline for Fulani ethnic group predominantly oval (96.34%) and to lesser extent circular (3.65%) (Table 3).

Table 3: Shape of Placental Outline for Fulani Ethnic Group

Placental Outline	Fulani N=383 (100%)
Oval	369 (96.34%)
Circular	14 (3.65%)
Total	383 (100%)

Incidence of pale maternal surface of Fulani placentae constituted (14.09%) (Table 4)

Table 4: Incidence of Colour Types on the Maternal Surface of Fulani placentae

Colour	Fulani
	N = 383 (100%)
Maroon	329 (85.9)
Pale	54 (14.09)
Total	383 (100)

The incidence of nodular and soft consistency placenta in Fulani Parturients was (0.78%) and (0.26%) respectively (Table 5).

Table 5: Placental consistency for Fulani Parturients:

Placental Consistency	Fulani
	N =383 (100%)
Normal	374 (97.65)
Nodular	5 (0.78)
Soft	1 (0.26)

Discussion

The mean placental diameter (MPD) was higher in Fulani ethnic group in this study than was documented for Hausa placentae in a similar studies conducted previously in Kano, Nigeria India and the United States of America.^[16,17,18,19] This distance was found to be greater among Caucasians and Arab-Egyptians than the value recorded for Fulani in this study.^[2,13] Similar MPD as recorded for Fulani in this study was also documented for Yoruba ethnic group in similar study carried out beforehand in Lagos, Nigeria and for Indians and in yet another similar research work.^[3,20] The differences noticed may not be unconnected with genetics, environmental and nutritional factors.

The placental thickness (PT) recorded for Fulani ethnic group was found to be similar to that recorded for Hausa ethnic group as reported by Saleh in a similar study.^[16] This dimension was reported to be higher in Caucasians than the value recorded for the Hausa and Fulani ethnic groups.^[2,14,21] PT was reported to be higher in Yoruba ethnic group than in

the Caucasians.^[3] This disparity may be associated with genetics, dietary and environmental factors.

The placental weight (PW) in this study was found to be also similar to what was reported for Hausa ethnic group in a previous study.^[16] Another study reported similar PW value for the Caucasians as was recorded for Fulani in thus study.^[2] The PW value for the Egyptians was reported in a previous study to be higher than the Hausa and Fulani value in this study.^[22] A higher PW value was documented for Yoruba ethnic group in a similar previous study than the one recorded for Fulani in this study.^[3] Similarly the reasons for the disparity of the placental weight may be varied and associated with genetics, dietary and environmental factors. In addition to application of different methodology of weighing placenta as may be employed by different researchers such as weighing trimmed or untrimmed placenta; digital or mechanical; washing placenta with water or cleansing its blood clots with blotted paper.

The number of placental cotyledons (NPC) was higher in Fulani placentae than as was recorded for Hausa ethnic group. [16] Another study documented higher NPC in Caucasians than in Fulani ethnic group. [14] Higher NPC was reported for Indians than was reported for Caucasians. [23] The reason for the differences may be genetic, dietary and environmental.

The placental consistency in this study was found to be normal in the majority of Fulani placentae while nodular and soft placentae were few. These values were higher in Hausa placentae as recorded in a similar study. [16] The variation in placental consistency observed in this study is in agreement with a similar finding in a study conducted in Lagos, Nigeria. [3] The reason for the abnormal consistencies is not yet clear however, pathological examination may provide further clarification on the nature of the abnormalities.

Oval outline was the major outline among the Fulani placentae in this study. A similar finding in a study conducted on Hausa ethnic group was also recorded. [16] Another study in India documented that the usual placental outline to be oval. [24] The reason may be genetic.

The major colour of the maternal surface of placenta for Fulani ethnic group in this work was found to be maroon. This finding is in agreement with similar studies conducted on Yoruba and Hausa ethnic groups. [3, 16] However, a small proportion of the maternal surfaces of the placentae in this study appeared to be pale. In a study on placenta in the United States of America documented that pallor of the maternal surface of the placenta may indicate fetal anaemia or haemorrhage; other reasons may be associated with maternal malnutrition and deficiency anaemia. [25]

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