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Pregnancy outcomes and associated characteristics at the expected date of delivery and beyond in a large tertiary hospital in Ghana

Alexander KO Yeboah [1*], **Kwaku Asah-Opoku** [1,2], **Kwame Adu-Bonsaffoh** [1,2], **Donne K Ameme** [3], **Kareem Mumuni** [1,2], **Joseph Seffah** [1,2], **Kobinah Nkyekyer** [1,2], **Alfred E Yawson** [4]

[1] Department of Obstetrics and Gynaecology, Korle-Bu Teaching Hospital, [2] Department of Obstetrics and Gynaecology, University of Ghana Medical School, College of Health Sciences, University of Ghana, Accra, Ghana; [3] Ghana Field Epidemiology and Laboratory Training Programme, School of Public Health, University of Ghana, Legon, Accra, Ghana; [4]Department of Community Health, University of Ghana Medical School, College of Health Sciences, University of Ghana, Korle-Bu, Accra, Ghana.

Abstract

Background: Globally, pregnancies that have gone beyond the expected date of delivery (EDD) contribute significantly to maternal and perinatal morbidity and mortality.

Objective: This study aimed to determine the proportion, pregnancy outcomes, and associated characteristics of deliveries at EDD and beyond at the Korle-Bu Teaching Hospital (KBTH) in Accra, Ghana.

Methods: This was a cross-sectional study conducted at the KBTH. Postpartum women who delivered at a gestational age of 40 weeks and beyond were selected from the labour wards, grouped according to gestational age, and followed up to their first postnatal visit. Data were collected on demographic, obstetric and postpartum health status. The association between study variables and delivery at and beyond EDD was determined using the F-test statistic and Chi-square test for continuous and categorical outcomes, respectively. A $p < 0.05$ was considered statistically significant.

Results: Of the 300 participants, 44% (n = 132) delivered at 40 weeks plus 0 to 6 days (40^{+0-6} weeks) of gestation, 44.7% (n = 134) at 41^{+0-6} weeks, and 11.3% (n = 34) at ≥ 42 weeks. The proportion of deliveries at EDD and beyond was 9.9% (n = 300/304) of total deliveries during the period. The pregnancies ≥ 42 weeks were 1.1% (n = 34/3041) of total deliveries. Factors that were significant associations with women who delivered at $\geq 42^{+0}$ weeks were a referral from other hospitals ($p < 0.017$), labour induction ($p < 0.001$), a longer first stage of labour ($p < 0.008$), and a longer total labour duration ($p < 0.009$).

Conclusion: The proportion of deliveries in which the pregnancies had progressed to the EDD and beyond and that of prolonged pregnancy at the KBTH were 9.9% and 1.1%, respectively. The duration of the first stage of labour and the total duration of labour was longer in women with pregnancies ≥ 42 weeks.

Keywords: Prolonged pregnancy, expected date of delivery, maternal outcomes

INTRODUCTION

Most pregnant women worry when they have not delivered by their expected date of delivery [1,2]. This maternal anxiety worsens the farther away the delivery is from the expected date of delivery (EDD). This anxiety is partly because women at their first antenatal visit are not made aware that they are most likely to deliver between 37 – 42 weeks and not necessarily on the EDD. Aside from maternal anxiety, pregnancy beyond the EDD (postdate) presents other complications to the mother [3,4]. Beyond 40 weeks of gestation, the risk of operative vaginal delivery, chorioamnionitis and endometritis increases just as the risk of caesarean delivery increases beyond 41 weeks of gestation. Generally, the risks to both mother and baby increase as pregnancy progresses beyond 40 weeks [5,6]. Studies have shown that complications such as puerperal infections, postpartum haemorrhage, cephalopelvic disproportion, lacerations in the vulva, vagina and cervix,

*** Corresponding author**
  Email: lexyebs@hotmail.com

vaginal or vulval hematomas, pelvic floor injury due to fetal macrosomia were significantly increased in patients who deliver at or beyond 42 weeks of gestation [7]. In addition, intrapartum emergency caesarean deliveries have also been found to increase significantly in patients who deliver at or beyond 42 weeks of gestation [8,9]. Given the adverse maternal and fetal outcomes, it has been suggested that pregnancies with gestational age beyond 40 weeks are considered functionally prolonged pregnancies [10]. However, the overall implication of this functional definition of prolonged pregnancy for clinical practice is yet to be considered. Accurate diagnosis of postdate pregnancy (gestation > 40 weeks) or prolonged pregnancy (gestation ≥ 42 weeks) depends on the accurate dating of the pregnancy. A previous study at the Korle-Bu Teaching Hospital (KBTH) in Ghana found a prevalence of prolonged pregnancy of 0.5% without a detailed analysis of maternal outcomes [11]. In that assessment, traditional methods of dating a pregnancy, such as fundal height measurement alone or pregnant women's last menstrual period (LMP), were used to date 66% of pregnancies of women. The reported incidence of prolonged pregnancy in that study may not be a true reflection of what pertains, as the pregnancy dating methods used have been found by several studies to be unreliable compared to first-trimester ultrasound scans [12−16]. This study thus aimed to determine and compare the prevalence and maternal outcomes associated with pregnancies at the gestational ages of 40 weeks plus 0 to 6 days (40^{+0-6} weeks), 40^{+0-6} weeks, 41^{+0-6} weeks, and ≥ 42 weeks at the KBTH in Accra, Ghana, using first-trimester ultrasound for dating pregnancy.

MATERIALS AND METHODS

Study design
This study was a cross-sectional study conducted at the department of Obstetrics and Gynaecology at the KBTH in Accra. The cross-sectional study was used because, in a snapshot, women who had delivered at or beyond 40 weeks were selected, with pregnancy outcomes and associated factors determined. This saved us time and reduced the cost of the study as opposed to a prospective study.

Study site
The KBTH is a tertiary hospital in Ghana with a bed capacity of 2000, daily outpatient attendance of 1500 and average daily admission of 150 patients. The Obstetrics and Gynaecology department is the biggest in the hospital and delivers between 10,000 to 12,000 women annually. It has a total of 375 beds with an average caesarean section rate of 40.5% [10,11]. At the KBTH maternity unit, all births, whether by spontaneous vaginal delivery or caesarean section and immediate maternal and fetal outcomes, are recorded in the labour ward register in chronological order according to the time of delivery.

Sample Population and sampling procedure
The minimum sample size required for the study was 282, determined with an estimate of 20% of pregnancies going

beyond the EDD [11] at a 95% confidence level, and an error margin of 5%. A 15% adjustment was included to cater for data incompleteness and inconsistencies, and the sample size was rounded to 300. A total of 300 women who delivered at KBTH with pregnancies at or beyond 40 weeks were consecutively selected. Inclusion criteria were women whose pregnancies were dated by first-trimester ultrasound scan and women who delivered at or beyond 40 weeks. Women excluded from the study were those with chronic diseases or medical conditions in pregnancy and those with multiple gestations. All participants were selected from the labour wards of the KBTH from the 25th of September 2014 through the 15th of February 2015. The labour ward register was reviewed each morning to identify all women who had delivered. The antenatal and delivery record books of the labour ward were reviewed, and eligible subjects were traced to the ward for interviews using a structured questionnaire. The questionnaire was structured with the following subsections: sociodemographic characteristics, obstetric history, and maternal outcomes. The questionnaire was pretested at the Greater Accra Regional Hospital, and some modifications were made to the questions subsequently. The final questionnaire was administered after the selected women provided written informed consent. A follow-up was made daily on the selected women on the wards to detect the development of any complications. The women were monitored until discharged from the hospital. Data on the patients were extracted from their folders, admission and discharge books at the labour and recovery wards, as well as from the obstetric operation register. After discharge from the hospital, patients were seen at the first postnatal visit or called on the telephone two weeks post-discharge to assess their health statuses, such as fever or excessive bleeding per vaginum.

Statistical analysis
Data was captured using Microsoft Excel 2007 and imported into the Statistical Package for Social Sciences version 21 for Windows (Armonk, New York, USA: IBM Corporations) for analysis. Descriptive statistics (frequencies, mean and standard deviation) were calculated, and the results were presented in Tables. The F-test with two-way analysis of variance (ANOVA) was used to compare the means of the different gestational age groups (40^{+0-6} weeks, 41^{+0-6} weeks, and ≥ 42 weeks). Post hoc analysis using Bonferroni's method was done, after ANOVA to determine the specific significant difference between the variables. For categorical variables, the Chi-square test or the Fisher exact test was used. Significance was determined at the 95% confidence level.

RESULTS

Of the 300 participants included in the study, 44.0% (n = 132) of patients delivered at 40^{+0-6} weeks (group A), 44.7% (n = 134) of patients delivered at 41^{+0-6} (group B), and 11.3% (n = 34) of patients delivered at ≥ 42 weeks (group C). The total number of deliveries during the study

Table 1: Characteristics of women at the various gestational age groupings, Korle-Bu Teaching Hospital, Ghana

Characteristics	Gestational age at delivery [n, (%)]				
	40^{+0-6} weeks	41^{+0-6} weeks	≥ 42 weeks	Total	*p* value
Age in years (mean ± SD)	30.1 ± 5.4	29.5 ± 4.8	28.8 ± 5.3		0.373
Gravidity (mean ± SD)	2.8 ± 1.7	2.8 ± 1.7	2.8 ± 1.7		0.373
Parity (mean ± SD)	1.0 ± 1.1	1.1 ± 1.5	1.2 ± 1.3		0.484
Marital status					0.959
Single	14 (41.2)	15 (44.1)	5 (14.7)	34	
Married	114 (44.4)	115 (44.7)	28 (10.9)	257	
Co-habiting	4 (44.4)	4 (44.4)	1 (11.1)	9	
Educational Level					0.265
None	6 (26.1)	15 (65.2)	2 (8.7)	23	
Primary/JHS	42 (39.6)	49 (46.2)	15 (14.2)	106	
SHS	40 (48.2)	33 (39.8)	10 (12.0)	83	
Tertiary	44 (50.0)	37 (42.0)	7 (8.0)	88	
Occupation					0.520
Housewives	3 (15.8)	12 (63.2)	4 (21.1)	19	
Artisans	39 (46.4)	34 (40.5)	11 (13.1)	84	
Traders	42 (39.6)	50 (47.2)	14 (13.2)	106	
Professionals (Doctors, lawyers, Accountants etc.)	41 (57.7)	25 (35.2)	5 (7.0)	71	
Others	7 (35.0)	13 (65.0)	0	20	
Religion					0.036
Christian	123 (46.8)	112 (47.5)	28 (10.6)	263	
Islam	9 (24.3)	22 (59.5)	6 (16.2)	37	
Previous postdate (Post EDD)					0.782
Yes	9 (39.1)	12 (52.2)	2 (8.7)	23	
No	123 (44.4)	122 (44.0)	32 (11.6)	277	
Previous CS					0.011
Yes	26 (65.0)	10 (25.0)	4 (10.0)	40	
No	106 (40.8)	124 (47.7)	30 (11.5)	260	
Known LMP					0.179
Yes	39 (51.3)	27 (35.5)	10 (13.2)	76	
No	93 (41.5)	107 (47.8)	24 (10.7)	224	

%, percentage; SD, standard deviation; JHS, Junior Secondary School; SHS, Senior Secondary School; EDD, estimated due date; LMP, last menstrual period; CS, caesarean section; 40^{+0-6} weeks, 40 weeks plus 0 to 6 days

period was 3,041. The proportion of deliveries in which the pregnancies had progressed to the EDD and beyond in this study was 9.9% (n = 300/3041), and that of prolonged pregnancy ≥ 42 weeks was 1.1% (n = 34/3041).

Sociodemographic characteristics of participants

The sociodemographic characteristics of the various groups are shown in Table 1. The mean ages for women in groups A, B and C were 30.09 ± 5.39, 29.49 ± 4.41, and 28.82 ± 5.29, respectively. There were no statistically significant (*p* = 0.373) differences between the mean ages. Nearly 86.0% (n = 257/300) of the 300 participants were married, 92.0 % (n = 277) had some form of education, 35.3% (n = 106) were traders, and 6.3% (n = 19) were housewives.

Obstetrics and gynaecological characteristics

There was no significant difference between the three groups of women in terms of the total number of pregnancies and parity (Table 2). Of the 300 women in the study, only 7.7% (n = 23) had previous pregnancies that went beyond the EDD and the difference in proportions of such patients in each group was not statistically significant. About 13.3% (n = 40) had a previous caesarean section. The previous caesarean section rate was 19.7% (n = 26/132) in group A, 7.5% (n = 10/134) in group B, and 11.7% (n =

4/34) in group C, and these differences were statistically significant (*p* = 0.011). Even though there were no significant differences amongst the groups in terms of knowledge of their LMP, 75% (n = 224) of all the women in the study could not recollect their LMP. The majority (66.0%, n = 198) of the women were referred from other facilities. The most common referral diagnosis was postdated (38.3%, n = 76) (Table 2). The proportion of referred patients significantly (*p* = 0.017) increased from 61.4% (n = 81) in group A to 71.6% (n = 96) in group B, and then to 85.3% (n = 29) in group C. The majority (57.7%, n = 173) of the women in the study had spontaneous onset of labour, with the proportion of women with spontaneous onset of labour reducing from 72.0% (n = 95) in group A to 48.5% (n = 65) in group B, and 38.2% (n = 13) in group C. On the contrary, the number of women who had induced labour increased from 17.0% (n = 23) in group A to 41.8% (n = 56) in group B, and then to 53.0% (n = 18) in group C. The differences were statistically significant (*p* < 0.001). All the induction of labour was done with the use of misoprostol, and there was no significant difference in the mean dose of misoprostol used among the three groups (*p* < 0.330) (Table 2). Table 2 shows that the mean total duration of labour in minutes was significantly

(p < 0.009) longer in group C (605.3 ± 772.0) compared to group A (388.5 ± 171.0) and group B (380.0 ± 175.3). These differences resulted from the significant change in the duration of the first stage of labour in group C compared to groups A and B (p = 0.008). When these findings were subjected to a post hoc analysis (Table 4), the difference in the duration of the first stage of labour was significant between groups A and C (p < 0.005) and between groups B

and C (p < 0.002) but not between groups A and B (p < 0.815). The total duration of labour in minutes showed a similar trend among the groups (Table 3). For those who had emergency caesarean section after going through labour, there was a significant(p < 0.028) difference in the duration of labour between the three groups —with labour being considerably longer in group C. These differences also persisted after a post hoc analysis, with a significant

Table 2: Labour and delivery outcome indicators of women at the various gestational age groupings, Korle-Bu Teaching Hospital, Ghana.

Characteristic	Gestational age at delivery [n, (%)]				
	40^{+0-6} weeks	41^{+0-6} weeks	≥ 42 weeks	Total	p value
Referred for care					0.017
Yes	81 (39.3)	96 (46.6)	29 (14.1)	206	
No	51 (54.3)	38 (40.4)	5 (5.3)	94	
Mean gestational age at referral in weeks (mean ± SD)	36.2 ± 4.9	38.2 ± 4.7	41.5 ± 2.1		< 0.001
Gestational age at referral					< 0.001
< 40 weeks	46 (55.4)	34 (41.0)	3 (3.6)	83	
40^{+0-6} weeks	35 (56.5)	25 (40.3)	2(3.2)	62	
41^{+0-6} weeks	0 (0.0)	37 (77.1)	11 (22.9)	48	
≥ 42 weeks	0 (0.0)	0 (0.0)	13 (100.0)	13	
Onset of labour					< 0.001
Spontaneous	95 (54.9)	65 (37.6)	13 (7.5)	173	
Induced	23 (23.7)	56 (57.7)	18(18.6)	97	
Elective caesarean section	14(46.7)	13 (43.3)	3 (10.0)	30	
Doses of misoprostol used in micrograms (mean ± SD)	94.4 ± 46.4	75.0 ± 34.6	78.1 ± 31.5		0.330
Mode of delivery					0.080
Vaginal	69 (38.8)	88 (49.4)	21 (11.8)	178	
Caesarean	63 (51.6)	46 (37.7)	13 (10.7)	122	
Blood loss at vaginal delivery in mL (mean ± SD)	228.9 ± 85.1	252.8 ± 208.3	238.1 ± 97.3		0.849
Blood loss at caesarean section in mL (mean ± SD)	438.7 ± 185.4	435.9 ± 196.2	434.6 ± 185.2		0.548
Birth weights in gram (mean ± SD)	3193.9 ± 478.3	3194.4 ± 416.1	3258.8 ± 440.5		0.730
Mean duration of 1st stage of labour in minutes (Mean ± SD)	366.4 ± 169.2 [a]	355.5 ± 169.4 [b]	570.9 ± 711.4 [c]		0.008
Mean Duration of 2nd stage of labour in minutes (mean ± SD)	16.1 ± 13.8	17.4 ± 22.2	14.7 ± 10.4		0.796
Mean Duration of 3rd stage of labour in minutes (mean ± SD)	6.1 ± 5.1	7.1 ± 7.4	7.1 ± 6.7		0.621
Mean duration of labour in minutes (mean ± SD)	388.49 ± 171.0 [a]	380.0 ± 175.3 [b]	605.3 ± 772.0 [c]		0.009
Mean Duration of labour (in minutes) in those who laboured before caesarian section (mean ± SD)	417.0 ± 237.0 [a]	330.2 ± 201.4 [b]	674.0 ± 262.6 [c]		0.028
Episiotomy					0.533
Yes	22 (45.8)	21 (43.8)	5 (10.4)	48	
No	47 (36.2)	67 (51.5)	16 (12.3)	130	
Instrumental vaginal delivery					0.147
Yes	3 (100.0)	0	0	3	
No	66 (37.7)	88 (50.3)	21 (12.0)	175	
Chorioamnionitis					0.533
Yes	1 (100.0)	0	0	1	
No	131 (43.8)	134 (44.8)	34 (11.4)	299	
Vulval/vaginal/cervical tears					0.412
Yes	20 (37.0)	25 (46.3)	9 (16.7)	54	
No	49 (39.5)	63 (50.8)	12 (9.7)	124	
Type of Caesarean section					0.792
Elective	14 (46.7)	13(43.3)	3 (10.0)	30	
Emergency	49 (53.2)	33(35.9)	10 (10.9)	92	
Complications of caesarean section					0.607
Yes	2 (100.0)	0	0	2	
No	61 (50.8)	46 (38.3)	13 (10.8)	120	

Post hoc analysis, the variables with the same superscript (a or b) indicate significant difference between the two figures; Mean gestation age in weeks at referral was calculated for a n = 206 participants; %, percentage; 40^{+0-6} weeks, 40 weeks plus 0 to 6 days

Table 3: Indications for caesarean section among study participants, Korle-Bu Teaching Hospital, Ghana

Indications for caesarean section	Gestational age at delivery [n, (%)]		
	40 $^{+ 0 - 6}$ weeks	41 $^{+ 0 - 6}$ weeks	≥ 42 weeks
Previous caesarean sections	18 (28.5)	10 (21.7)	4 (30.8)
Malpresentations	5 (7.9)	3 (6.5)	0
Slow progress of labour	10 (15.9)	13 (28.3)	5 (38.5)
Fetal Distress	15 (23.8)	13 (28.3)	2 (15.4)
Intrauterine growth restriction	7 (11.1)	2 (4.3)	0
Failed inductions	2 (3.2)	3 (6.5)	2 (15.4)
Antepartum haemorrhage	1 (1.6)	2 (4.3)	0
Other indications	5 (7.9)	0	0
Total	63 (100)	46 (100)	13 (100)

%, percentage; 40 $^{+ 0 - 6}$ weeks, 40 weeks plus 0 to 6 days

difference between group A and C ($p < 0.037$) and between group B and C ($p < 0.008$). There was no significant difference in the mean duration of labour between groups A and B ($p < 0.197$). In terms of blood loss at delivery, there was no difference in the mean blood loss among the various groupings when vaginal delivery and caesarean sections were considered separately (Table 2). The caesarean section rate for failed induction of labour was marginally higher in group C (15.4%, n = 2) compared to 3.2% (n = 3) in group A and 6.5% (n = 2) in group B (Table 3). Also, the proportion of women who had a caesarean section for the slow progress of labour increased from 15% (n = 10) to 28.3% (n = 13) and then to 38.5% (n = 5) in groups A, B and C respectively.

DISCUSSION

Pregnancies at or beyond the expected date of delivery can pose a challenge and be a source of worry to caregivers and patients as well. The proportion of deliveries in which the pregnancies had gone to the EDD and beyond is 9.9% which is much lower than the 6.2% found in London [17] and the 9.0% found by Olesen et al. in Denmark [8]. However, the incidence of 1.1% obtained for prolonged pregnancy in this study was higher than the 0.5% reported by Seffah and Kwawukume in the same Hospital two decades ago [11]. This may be because all the pregnancies in this current study were dated by first-trimester ultrasounds, whereas the study by Seffah and Kwawukume was dated by the last menstrual period, fundal palpation or the ultrasound. About 85% (n = 29/34) of patients who delivered at ≥ 42 weeks were referred from other facilities, and 44.8% (n = 13/29) of these were referred at the time when the pregnancy was already ≥ 42 weeks. Thus, because of the policy of elective induction between 41 and 42 weeks of gestation, patients who are referred early are likely to be delivered before they reach 42 weeks of gestation. The overall effect of induction of labour would be to reduce the post-term pregnancy rate. Therefore, the true incidence of prolonged pregnancy may be difficult to obtain in contemporary obstetrics as most obstetric units in Ghana and elsewhere offer routine induction of labour between 41

and 42 weeks of gestation. The use of the last menstrual period to date pregnancy has been found by several studies to be less reliable compared to ultrasound scans in early gestation [12−15]. Reasons that have been given include poor recall by patients whose last menstrual periods are used and physiologic variations in the duration of the follicular phase, which tend to affect the timing of ovulation. That is why in this study, we relied on the first-trimester ultrasound scan for dating the pregnancies. In this study, the incidence of induction of labour increased steadily with increasing gestational age from group A to group C. The proportion of labour induction was three times higher in group C than in group A (53% versus 17%). On the contrary, the proportion of women who went into spontaneous labour decreased significantly from 72% in group A to 48.5% in group B and then to 38.2% in group C. Thus, as the number of women who go into labour spontaneously declined from 40 to 42 weeks, more women are likely to be induced to prevent prolonged pregnancy. This explains the higher number of inductions of labour in group C.

Adverse maternal outcomes associated with prolonged pregnancy have been documented in previous studies to include increased rate of caesarean section, puerperal infections, postpartum haemorrhage and obstetric trauma including perineal tears, cephalo-pelvic disproportion, labour dysfunction and shoulder dystocia [5,8,18,19]. In a study by Caughey and Musci [5], the risk of caesarean section was found to increase after 41 weeks of gestation. However, in the current study, the caesarean section rate was rather high in group A compared to groups B and C. This can be explained by the fact that more women in group A were at a higher risk of a repeat caesarean section because of the significantly higher previous caesarean section rate found in that group compared to the other groups. Excessive blood loss at delivery is a known complication of prolonged pregnancy, and fetal macrosomia has been implicated as the cause in some studies [8,19], but findings in the current study could not confirm this assertion as there was no difference in the mean blood loss both for vaginal delivery and caesarean section. In studies done elsewhere,

the risk of maternal haemorrhage was related to fetal size [19− 21]. In the current study, however, there was no significant difference in the mean birth weights among the various gestational age groups. This may have accounted for the lack of significant difference among the groups as far as maternal haemorrhage was concerned. Also, increased fetal size has been found to contribute to an increased risk of obstetric trauma in prolonged pregnancies [8,18,19]. Therefore, the lack of significant difference observed among the three groups concerning obstetric trauma, such as vulvovaginal lacerations and haematoma, may be due to the lack of significant difference in the birth weights obtained in this study.

In a population-based study in Denmark, Campbell and colleagues observed an increased prevalence of labour dysfunction in post-term pregnancies compared to term pregnancies and found that the dysfunction was related to increased fetal size [19]. In our hospital-based study, the duration of labour was significantly longer in women who delivered after 42 weeks compared to earlier gestations. However, this cannot be attributed to fetal size because there was no significant difference in the mean birth weights. Even for those who had emergency caesarean section after the onset of labour, the duration of labour was significantly longer in women whose pregnancies were ≥ 42 weeks. The cause of the longest duration of labour in group C, therefore, cannot be explained directly by the findings in this study; however, uterine dysfunction could be the cause. This assertion may be supported by the fact that more women in group C compared to women in groups B and A had a caesarean section on account of the slow progress of labour.

In the current study, there was a single case of chorioamnionitis and three cases of vacuum delivery which occurred in women within the 40th week. Caughey and Musci observed that the risk of operative vaginal delivery, chorioamnionitis and endomyometritis begin to rise at 40 weeks of gestation [5]. Because the number of women who had these complications of labour was few, conclusions similar to that obtained by Caughey and Musci cannot be drawn from this study. The sole use of the first-trimester ultrasound scan to date to select clients for this study is an improvement over the previous study in the same hospital. However, these ultrasound scans were done by different people; therefore, there could be variability among sonographers. This study was hospital-based, in contrast to a population-based study, and the findings may not represent what exists in the rest of the country. Thus, the findings of this study must be used within the confines of this limitation.

Conclusion
The proportion of deliveries for which the pregnancies had progressed to EDD and beyond and that of prolonged pregnancy at the KBTH was 9.9% (n = 300/3041) and 1.1% (n = 34/3041), respectively. The duration of the first stage of labour and the total duration of labour was significantly longer in women with pregnancies ≥ 42 weeks. There were,

however, no significant differences in maternal outcomes when pregnancies ≥ 42 weeks were compared with the earlier gestations (40 $^{+0-6}$ weeks and 41 $^{+0-6}$ weeks). Augmentation of labour may help reduce the prolonged labour duration in post-term pregnancies.

DECLARATIONS

Ethical considerations
The study was approved by the Ethical and Protocol Review Committee of the College of Health Sciences, University of Ghana (Protocol Identification Number: MS-Et/M.6-P3.8/2013-14). Permission was received from the Head of the Obstetrics and Gynaecology Department. Written informed consent was also obtained from all study participants after meeting the inclusion criteria.

Consent to publish
All authors agreed to the content of the final paper.

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Competing Interests
No potential conflict of interest was reported by the authors.

Author contributions
AKOY and KA-B developed the concept; AKOY and KA-O assisted with data collection; AKOY and AEY analysed the survey data; AKOY wrote the first draft manuscript, AKOY, KM, JDS, KN, AEY, KA-B, KA-O, DKA contributed to the writing and reviewing of the various sections of the manuscript before submission.

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Availability of data
Data for this work is available upon reasonable request from the corresponding author.

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