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EFFECT OF AGE AND PARITY ON THE MEDICAL INDICATIONS OF CESAREAN SECTIONS AMONG PREGNANT WOMEN

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Abstract:
Introduction: Caesarean section (CS) is considered the most common and important surgical procedure for women of childbearing age to deliver a baby. Over the years the rate of CS has been increasing and the cause of this rise in CS is multifactorial. Yet, the literature suggests that it largely results from advanced maternal age, particularly in primiparous women. This study, therefore, sought to investigate the effect of age and parity on CS and its indications. **Methods:** A retrospective study design and data for all mothers who had previously given birth at the hospital's obstetric and gynaecological departments was used. A descriptive statistic was conducted to ascertain the distribution of the various dependent and independent variables. The P-value was determined using Pearson's Chi-square and statistical significance was set at less than 0.05. **Results:** 40.6% of the participants delivered through CS. Foetal indications for CS contributed to 30% of the cases while previous CS contributed to 20.6% of current CS cases in this study. Finally, there were associations between CS, indications for CS, and some age-parity classifications but these associations were not parallel.

Keywords: caesarean section, maternal age, parity, indications

1. Introduction

Caesarean section is considered the most common and important surgical procedure for women of childbearing age to deliver a baby [1,15]. Over the last few years, the rate of

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caesarean sections has been alarmingly increasing, and this has been one of the most debated topics in maternal care as its prevalence cannot be associated with any clinical benefits [15]. The World Health Organization recommends reducing this intrusive procedure to at most 15% of all births, but research indicates that in many developed countries, caesarean section rates exceed the rate advocated by the World Health Organization [1] and this is due to the general lack of consensus concerning an appropriate CS rate among countries [8,13].

Furthermore, studies have shown that regardless of the variations between countries e.g., level of poverty, education, and life expectancy measured in the Human Development Index (HDI-index), a CS rate between 9-16% is appropriate [13] and as such CS above this rate provides no improvement in maternal or foetal outcomes [4,13–15] but rather potentially important direct maternal, and perinatal health implications as well as economic implications [8].

The reasons for the increase in CS are multifactorial (some medical and others non-medical), but the existing literature suggests that the increase is predominantly a result of advanced maternal age, particularly in primiparous women [13].

Therefore, knowing the most common medical indications for CS in Ghana, and how age and parity affect these indications will facilitate targeted interventions, thus resulting in reducing the number of CS performed.

2. Methods

2.1 Study Design and Area

The study employed a facility-based retrospective cross-sectional study design and was conducted at the Ledzokuku-Krowor Municipal Assembly (LEKMA) Hospital. The LEKMA Hospital is a 100-bed reference hospital constructed by the Chinese government as a China-Ghana Friendship Hospital in 2010. It is located in Teshie in the Greater Accra region. It has a general hospital department, such as a surgical theatre, blood bank, specialist services, radiology units, etc. LEKMA Hospital is the only public/government hospital in the Ledzokuku-Krowor Municipality.

2.2 Sampling and Data Collection

A total sampling technique was employed for the study. Records of all women (751) who had given birth at the facility during the year 2019 were used for the study. The data was cleaned by removing all incomplete records (data without age and parity), and in the end, 598 records were used for the study.

2.3 Data Analysis

The data was analysed using IBM-SPSS version 25. A descriptive statistic was conducted to ascertain the distribution of the various dependent and independent variables. The P-value was determined using Pearson's Chi-square and statistical significance was set at less than 0.05.

2.4 Ethics Approval

Ethical approval was obtained from the Ghana Health Service Ethics Review Committee as well as permission was sought from the management of the LEKMA Hospital before data collection.

2.5 Data Storage and Usage

The data extraction sheet was coded and kept in a secure location by the researcher. The data was then entered on a secure personal computer and backed up on a secure server to prevent loss of data.

3. Results

Table 1 shows the participants' sociodemographic and obstetric distribution patterns across the various delivery modes. 355 (59.4) of the participants delivered through spontaneous vaginal deliveries, while 243 (40.6) were delivered through caesarean sections. The average age for SVD was 28.3±5.94years and CS was also 29.6±5.50years. Significantly, most of the participants that delivered through SVD were aged 25 years and below, 119(33.5), while those that delivered by CS were mostly aged between 26-30 years, 100(41.2). Although insignificant statistically ($p>0.05$), most of the participants were employed regardless of their mode delivery, 295 (83.1) SVD and 201 (81.7) CS respectively. Term deliveries (182 (51.3) SVD and 151 (62.1) CS) were more in than preterm (31 (8.7) SVD and 32 (13.2) CS) or post-term (142 (40.0) SVD and 60 (24.7) CS) irrespective of the mode of delivery. Among previous births, the least for SVD and CS were among those that had had previous births of around 3 or more, 56 (15.8) and 27 (11.1) respectively.

Table 1: Distribution of sociodemographic and obstetrics characteristics among the study participants

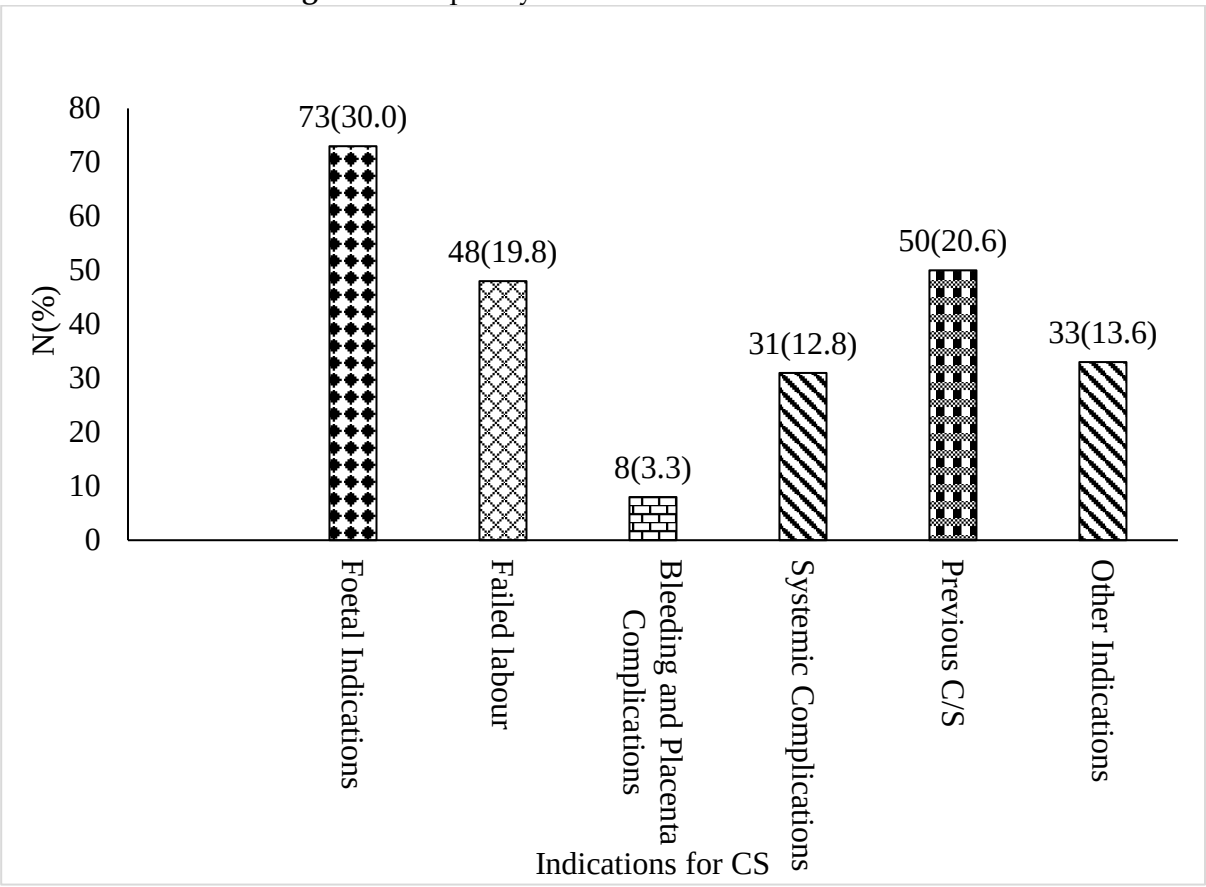
Variable	**SVD (n=355)**	**C/S (n=243)**	**Total (N=598)**	***P***
Age (n ± SD)	28.3±5.94	29.6±5.50	28.9±5.80	
Age Groups				
25yrs and below	119 (33.5)	48 (19.8)	167 (27.9)	***0.002***
26-30yrs	109 (30.7)	100 (41.2)	209 (34.9)	
31-35yrs	86 (24.2)	61 (25.1)	147 (24.6)	
36yrs and above	41 (11.5)	34 (14.0)	75 (12.5)	
Occupational Status				
Employed	295 (83.1)	196 (81.7)	491 (82.1)	0.653
Unemployed	42 (11.8)	35 (14.4)	77 (12.9)	
Student	18 (5.1)	12 (4.9)	30 (5.0)	
Educational Status				
None	33 (9.3)	43 (17.7)	76 (12.7)	***<0.0001***
Primary	17 (4.8)	5 (2.1)	22 (3.7)	
JHS	124 (34.9)	68 (28.0)	192 (32.1)	
SHS	101 (28.5)	54 (22.2)	155 (25.9)	
Tertiary	80 (22.5)	73 (30.0)	153 (25.6)	

Gestational Age				
Preterm	31 (8.7)	32 (13.2)	63 (10.5)	***<0.0001***
Term	182 (51.3)	151 (62.1)	333 (55.7)	
Post-term	142 (40.0)	60 (24.7)	202 (33.8)	
Parity				
Nulliparous	133 (37.5)	69 (28.4)	202 (33.8)	***0.004***
1-2 births	166 (46.8)	147 (60.5)	313 (52.3)	
3 or more births	56 (15.8)	27 (11.1)	83 (13.9)	

n = number of participants, N = Total number of participants, P<0.05 implies statistically significant P-value, n ± SD = mean ± standard deviation

Varying indications were used for the CS, and indications that had to do with the foetus, such as foetal distress, foetal macrosomia, big baby and footling breech were 73 (29.4). 33 (13.6) of the CS were as a result of other indications (examples are vulva warts, postdate, premature rupture of membrane and blood type), 48 (19.8) due to failed labour and 8 (3.3) due to bleeding and placental complications.

Figure 1: Frequency Distribution of Indications for CS



N (%) = frequency (percentage).

Table 2 compares the modes of delivery for Age Groups and Parity. The results showed no significant differences among the parities of persons of all age groups except those aged 36 years and above. In the latter, caesarean deliveries were significantly higher

among women with para 1-2, 23(67.60) than with nulliparous, 0(0.0) and para 3 or more women, 11(32.40).

Table 2: Modes of Delivery According to Age-Parity

Age Groups	Parity	Mode of Delivery		*P*
		SVD	CS	
25yrs and below	None	78(65.50)	31(64.40)	0.800
	1-2 births	40(33.60)	16(33.30)	
	3 or more births	1(0.80)	1(2.10)	
26-30yrs	None	43(39.40)	29(29.00)	0.890
	1-2 births	56(51.40)	66(66.00)	
	3 or more births	10(9.20)	5(5.00)	
31-35yrs	None	9(10.50)	9(14.80)	0.498
	1-2 births	57(66.30)	42(68.90)	
	3 or more births	20(23.30)	10(16.40)	
36yrs and above	None	3(7.30)	0(0.00)	***0.005***
	1-2 births	13(31.70)	23(67.60)	
	3 or more births	25(61.00)	11(32.40)	

Table 3 shows the age group-specific parity distributions of the varying clinical indications for CS among the participants. Significantly, most participants aged 25 years and below irrespective of the indication for CS were nulliparous. Among those aged 26-30 years, significantly, most of the foetal complications that resulted in CS occurred in those with 1-2 births 16(55.2), followed by the primiparous 12(41.4). Previous CS as an indication for the current CS in the same age group occurred mostly in participants with para 1-2, 18(94.7). Systemic complications that contributed to CS were equal in the nulliparous and para 1-2 participants, 4(44.4) each. None of the participants aged 31-35 years underwent CS due to failed labour, bleeding and placenta complications, or systemic complications. Other clinical indications for CS such as vulva warts, postdate, premature rupture of membrane and blood type were statistically significantly greater among persons aged 31-35 years with 3 or more previous births. None of the indications for CS were statistically significant within the various parity classifications of those aged 36 years and above.

Table 3: Foetal-Maternal Indications for CS Deliveries According to Age-Parity

Age Groups	Parity	Foetal Indications (n=73)	Maternal Indications					*P*
			Failed Labour	Bleeding and Placenta Complications	Systemic Complications	Other Indications	Previous C/S	
25yrs and below	None	15(78.9)	5(71.4)	1(50.0)	6(75.0)	4(66.7)	-	***0.018***
	1-2 births	4(21.1)	2(28.6)	1(50.0)	2(25.0)	1(16.7)	6(100.0)	
	3 or more births	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(16.7)	0(0.0)	
26-30yrs	None	12(41.4)	9(33.3)	1(33.3)	4(44.4)	3(23.1)	-	***<0.0001***
	1-2 births	16(55.2)	18(66.7)	0(0.0)	4(44.4)	10(76.9)	18(94.7)	
	3 or more births	1(3.4)	0(0.0)	2(66.7)	1(11.1)	0(0.0)	1(5.3)	
31-35yrs	None	5(27.8)	2(25.0)	0(0.0)	1(11.1)	1(12.5)	-	***0.043***
	1-2 births	12(66.7)	6(75.0)	1(100.0)	8(88.9)	3(37.5)	12(70.6)	
	3 or more births	1(5.6)	0(0.0)	0(0.0)	0(0.0)	4(50.0)	5(29.4)	
Above 35 years	None	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	-	0.165
	1-2 births	6(85.7)	5(83.3)	2(100.0)	2(40.0)	2(33.3)	6(75.0)	
	3 or more births	1(14.3)	1(16.7)	0(0.0)	3(60.0)	4(66.7)	2(25.0)	

4. Discussion

CS is medically indicated when a significant risk of an adverse outcome for the mother or the foetus is present if the operation is not performed at a given time. In contrast, non-medically indicated CS occurs for reasons other than a risk of adverse outcomes [1]. This study observed 40.6% caesarean deliveries, a value that was greater than the 10-15% recommended by the WHO [17], previous studies in the Sub-region [5,10] and as well as the findings of multiple studies across the continent [3,16].

Any factor that can result in the loss of the foetus is unacceptable. As such, various medical interventions are triggered whenever any stressor can contribute to foetal morbidity or mortality. Thus, this study found the unsurprisingly high 30% rate in CS due to foetal indications of various forms such as foetal distress, foetal macrosomia, big baby and footling breech. This was close to the 35.5% foetal-related indications found earlier in Ghana [10] as well as the 36.1% observed among adolescent mothers in Burkina Faso [9]. Previous CS is also known to contribute the greatest to current CS due to its link to uterine rapture, morbidly adherent placenta and placenta previa [7]. Therefore, this study reporting the previous CS (20.6%) as the major maternal indication for current CS was not farfetched, but rather an add-on to earlier reports [6,8,14]. Additionally, several medical conditions have been implicated in the rise of CS, and this study reporting some of these conditions as indications for CS among the participants affirms earlier findings across the world [4,10,12,13].

Several morbidities and mortalities in pregnancies have been implicated as complications of advancing age and parity. As such, previous studies have reported the rise in CS increases with age and parity, and this is a measure to reduce the risk of morbidity and mortality [2,11,13]. Yet, this study reports no significant association between the two delivery modes in most age-parity classifications. This study contradicts earlier reports which recorded significant increases in CS sections with increasing age in primiparous and multiparous participants and that primiparous/nulliparous women were at greater risk of CS than multiparous women as their age advanced [2,13].

To further probe into the age-parity relationship with CS, it was assessed against the clinical indications for CS and our findings reveal that the indicators for CS at specific age groups across different parity classifications were most significant. This study significantly reports that nulliparous participants at age 25 years and below mostly gave birth through CS than persons of the same age group with previous births irrespective of the medical indication that resulted in the caesarean section. It also reports that participants aged above 26 years irrespective of the indication for CS were majorly para 1-2. Therefore, age and parity did not increase with CS and its indications in most instances as reported in earlier studies [2,11,13] but rather in all ages, para 1-2 participants were at a greater risk of CS than nulliparous or para 3 or more participants. Nonetheless, this report is limited due lower number of para 3 or more participants which may be the reason for the disparity.

Conflict of Interest Statement

The authors declare no conflicts of interest.

About the Authors

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