

Relation between Obstetric Outcome and Parity

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Abstract

Objectives: To evaluate the prognosis of obstetric complications by parity in a suburban center in Dakar. **Patients and Method:** We conducted a retrospective and prospective, cross-sectional study that evaluated all women admitted to the Philippe Maguilen Senghor Health Center for the management of their pregnancy (childbirth, abortion, ectopic pregnancy), whether they were primiparous or multiparous. The data for this study covered a 66-month period, from January 1, 2012 to June 30, 2017. Data were entered into our E-perinatal computer database. They were then extracted and analyzed first on Microsoft Excel 2016 and then on SPSS 24, Windows version. **Results:** Between January 2012 and June 2017, we've registered 27,441 patients including 25,905 deliveries, 1415 abortions and 121 ectopic pregnancies. Direct obstetric complications involved 14.1% of our patients. 12.1% multiparous and 17.3% primiparous had at least one direct obstetric complication of World Health Organization (WHO). Antepartum haemorrhage, uterine rupture, ectopic pregnancy, and abortion complications were more common in multipara, whereas prolonged and obstructed labor, preeclampsia, and eclampsia were more common in primiparous women. Postpartum haemorrhage occurred at substantially equal frequencies in both parity groups. We had not found any case of sepsis. **Conclusion:** Our study confirms that primiparity is a factor that may lead to obstetric complications. However, while some complications were more common in the primiparous, others were exclusive to multiparous when we did not expect it. We also recommend continuing this work by singling out multiparas and large multiparas, in order to better understand the obstetric prognosis linked to parity.

Keywords

Direct Obstetric Complications, Primiparous, Multiparous

1. Introduction

At the dawn of the third millennium, the drama of maternal mortality remains

the same, a scourge that strikes hard on our developing countries and particularly Africa, where the very precarious socio-economic, environmental and health conditions expose women to the complications of pregnancy and childbirth [1]. Approximately 830 women die every day in the world because of complications related to pregnancy or childbirth. About 99% (302,000) of the world's maternal deaths in 2015 occurred in developing countries, with sub-Saharan Africa alone accounting for 66% of deaths (201,000), followed by South Asia (66,000). In Senegal, maternal mortality was estimated in 2015 at 315 maternal deaths per 100,000 live births [1].

About 15% of women develop a complication during pregnancy that requires the intervention of qualified healthcare provider [1]. In about 5% of cases, these complications can be life-threatening [2]. Approximately 80% of maternal deaths result directly from complications of pregnancy, childbirth, or the puerperium.

Intra-partum risk is based primarily on the past obstetrical history that is lacking in all primiparity. There are fundamental differences between the normal delivery of a primiparity and that of a multipara. Compared to multipara, primiparity is more likely to develop labor abnormalities that require intervention [3]. Numerous studies have shown that first pregnancies are at an increased risk of complications during pregnancy, labor and delivery, and if not properly managed, these complications can lead to increased morbidity and mortality of both the woman and her child [4].

The direct obstetric complications considered in this article are prolonged and obstructed labor, severe pre-eclampsia and eclampsia, ante or postpartum haemorrhage, uterine rupture, postpartum sepsis, complications of abortion and ectopic pregnancy [5].

This paper aims to determine the association between parity and obstetric complications.

2. Patients and Method

We conducted a retrospective and prospective, cross-sectional study, which evaluated all women admitted to the Philippe Maguilen Senghor Health Center (CSPMS) for the management of their pregnancy (childbirth, abortion, ectopic pregnancy), whether they were primiparous or multipares.

The data for this study covered a 66-month period from January 1, 2012 to June 30, 2017.

Were included in the study, all patients admitted from January 1, 2012 to June 30, 2017, for the management of their pregnancy, regardless of the parity or admission method.

We did not include in the study incomplete files (where one variable was missed).

Data were entered into our e-Perinatal computer database. They were then extracted and analyzed first on Microsoft Excel 2016 and then on Statistical Package for Social Science (SPSS 24), Mac version.

For each patient, we collected and analyzed the socio-demographic characteristics; data on pregnancy and childbirth; pathologies associated with pregnancy (hypertension, diabetes, premature rupture of membranes); direct obstetric complications (antepartum haemorrhage and postpartum haemorrhage, prolonged labor and dystocia, severe pre-eclampsia, uterine rupture, puerperal infection); maternal mortality; parameters related to the newborn (birth weight, Apgar score, fetal status at birth).

Continuous quantitative variables were described by their position and dispersion parameters: mean, median, mode, standard deviation. They were compared using the ANOVA (ANalysis Of VAriance) test.

The qualitative variables were described by proportions in relation to the total share. They were compared using the chi-square test were applicable or by non-parametric tests in the opposite case.

Comparisons of multiple proportions were also made using the chi-square test or non-parametric tests. If inter-group comparisons were significant, the adjusted standardized residuals were calculated (adjusted z-scores) and their adjusted alpha risk significance threshold adjusted for the number of adjusted values.

The level of significance used was 0.05.

3. Results

Between January 1, 2012 and June 30, 2017, we recorded 27,441 patients, including 25,905 deliveries.

The average age of the patients was 27 years with extremes of 11 and 53 years. More than half of the sample (54.5%) were aged between 20 and 29 years old.

We registered 18,655 (72%) vaginal deliveries and 7250 (28%) cesarean sections.

Out of the 27,441 patients, 3864 (14.1%) had a direct obstetric complication.

During the period study, 29 deaths occurred leading to a maternal mortality ratio (MMR) of 115.8 per 100,000 live births; 58.6% were multiparous and 41.4% were primiparous.

The majority (41.4%) of the patients had died within 24 hours of delivery.

86.2% of maternal deaths cases were caused by a direct obstetric cause dominated by haemorrhage and eclampsia, 3.5% of cases were due to indirect obstetric causes while non-obstetric ones amounted to 10.3%.

Preterm and post-term deliveries rates were slightly higher in the primiparous group.

Abnormal presentations (breech, transverse), were more frequent in multipara (6.1%) than in primipara (5.1%).

Caesarean section was slightly more common in primiparous (28.4%) than in multiparous women (27.7%). This difference is not statistically significant ($p = 0.219$).

The primipara was more likely to be operated on for mechanical obstructed labor, eclampsia, acute fetal distress or convenience. Multiparous tended to be operated for dynamic dystocia, funicular dystocia, obstructed labor, labor failure

or multiple pregnancy.

Stillbirths were more common in multiparas (3.4%) than in primiparous (3.2%). The difference was not statistically significant ($p = 0.287$). Primiparous women were more likely to have newborns with an Apgar score less than 7 in the first minute of life (17.6%), and newborns with a birth weight of less than 2500 grams were more common in primiparous women (14.4%).

Regarding other pathologies of pregnancy, the occurrence of gestational diabetes was identical for multiparas and primiparous, representing for each, 2% of patients.

Premature rupture of membranes and hypertension were more common in primiparous than in multiparous patients with 7.8% and 5.1%, respectively.

12.1% multiparous and 17.3% primiparous had at least one direct obstetric complication according to the World Health Organization (WHO) classification (**Table 1**). This difference is statistically significant.

Overall, antepartum haemorrhage, uterine rupture, ectopic pregnancy, and abortion complications were more common in multiparous, whereas prolonged and obstructed labor, preeclampsia and eclampsia were more common in primiparous (**Table 2**). Postpartum haemorrhage occurred at substantially equal frequencies in both groups as shown.

Table 1. Distribution of patients according to obstetric complications and parity.

Direct obstetric complications	Parity		Total	p
	Multipara N (%)	Primipara N (%)		
Yes	2069 (12.1)	1795 (17.3)	3864 (14.1)	<0.001
No	14,981 (87.9)	8596 (82.7)	23,577 (85.9)	

Table 2. Distribution of patients according to type of obstetric complications and parity.

Obstetric complications	Parity		Total N (%)	p
	Multipara N (%)	Primipara N (%)		
Pregnancy and childbirth complication's (n = 25,905)				
Prolonged and obstructed labor	1160 (7.2)	1240 (12.5)	2400 (9.3)	<0.001
Preeclampsia and eclampsia	404 (2.5)	355 (3.6)	759 (2.9)	<0.001
Antepartum hemorrhage	384 (2.4)	158 (1.6)	542 (2.1)	<0.001
Postpartum hemorrhage	44 (0.3)	23 (0.2)	67 (0.3)	0.510
Uterine rupture	40 (0.2)	3 (0.0)	43 (0.2)	<0.001
Ectopic Pregnancy (n = 121)				
Ectopicpregnancy	69 (57)	52 (43)	121	-
Abortion complications (n = 79)				
Abortion complications	45 (57)	34 (43)	79	-

4. Discussion

The retrospective nature of the study involves a significant recording bias, as the data are collected from the records of patients already discharged from the Philippe Maguilen Senghor Health Center (CSPMS). Some parameters could have been omitted. However, this weakness has been corrected since 2016. In addition, we did not have any information concerning the state of health of the patients at the time of the post-natal visits; this factor may have contributed to underestimating maternal and neonatal morbidity and mortality rates.

Direct obstetric complications involved 14.1% of our patients. Our rate is relatively acceptable since participants in the World Health Organization (WHO) technical consultation decided to keep the estimate of the frequency of serious complications at 15% for the purposes of the assessment of Obstetric Care needs and Neonatal Urgency (SONU) [5]. Dia [6] found a rate of 8.1% of expected complications actually recorded and managed.

The various studies devoted to this question have given a whole range of results. For example, a prospective population study in six West African countries found that 6% of pregnant women had serious direct obstetric complications [7]. The authors indicate that their observations probably underestimate the reality because the terminology used to define complications was linked to medical interventions that may not be practicable in the health facilities under investigation. A prospective study of deliveries in India found an incidence of 17.7% for direct obstetric complications during labor [8]. However, these studies did not consider complications during pregnancy (complications of abortion and ectopic pregnancies), so the actual percentage of women with direct complications was probably higher.

12.1% of multiparous and 17.3% of primiparous women had at least one direct obstetric complication. Fall [9] and Kane [10] found in their studies a higher rate of obstetric complications in primiparous.

Regarding parity, the data in our study are consistent with those in the literature where antepartum haemorrhage is much more common in multiparas. Like Dièye [11], antepartum haemorrhage was present in 2.4% of multiparas whereas this was the case for only 1.6% of primiparous women. The risk in these parturients is due to the weakening of the uterus due to the numerous and fast rate of pregnancies.

Postpartum haemorrhage (PPH) occurred at relatively equal frequencies in multiparous (0.3%) and primiparous (0.2%), unlike literature data where PPH occurred more frequently in multipara and grand multipara. Keita [12] found a rate of 36.3% in multipara and grand multipara, Alihonou [13], a rate of 60.3%.

We have noted the prevalence of dystocia and prolonged labor among primiparous women with a rate of 12.5% against 7.2% in multiparas. Several studies have shown that, compared with multiparous women, nulliparas have a longer labor of delivery [14] [15], are at increased risk of intrapartum complications and undergo practically more obstetric interventions [16] [17] [18].

The results of our study are consistent with literature data that considers primiparity to be one of the most important risk factors [19]. Preeclampsia was more common in primiparous women than in multiparous women, with a rate of 3.6% versus 2.5%. According to Edouard [19], it is the notion of parity that explains the high risk of preeclampsia and eclampsia in young women and not maternal age. For Goffinet, pre-eclampsia is 3 to 4 times more common in primiparous than in multiparous. As in other studies [20] [21], our study showed a very significant association between primiparity and hypertension disorders.

Uterine rupture is a real barometer in the management of obstetric emergencies. It is considerably influenced by the socio-economic level of the countries [22] [23].

During our study period, 25,905 deliveries were registered in the department, including 43 uterine rupture. The frequency of uterine rupture is 0.2%, *i.e.* 1 uterine rupture for 602 deliveries. Compared to literature data, our frequency is lower than those reported by other studies in Africa. Guèye *et al.* [24] found a frequency of 0.58% (1 uterine rupture for 172 deliveries). Diakité [25] found a frequency of 0.37% (1 uterine rupture for 268 deliveries). Other studies in sub-Saharan Africa found relatively high frequencies: 0.36% in Dakar [23], 0.6% in the Central African Republic [26], 0.78% in Togo [27], 1.15% in Bamako [22] and 2.33% in Niger [28].

On the other hand, our figure remains high compared to the developed countries, where the uterine rupture constitutes an exceptional situation with a rate of 1/1000 to 1/2000 live births in France [29] and a rate lower than 1/1000 deliveries in the United States [30].

This high frequency could be explained by late evacuations and poor antenatal care, inadequate supervision of childbirth. These lower rates are underpinned by better access to health care and higher-quality technical platforms that are better suited for the treatment of uterine rupture [31].

In contrast to highly medicalized countries where uterine rupture, usually a result of disunion of uterine scars, occurring once in every 10,000 deliveries [25], this pathology still appears to be commonplace in developing countries, where it is a major problem.

The high frequency of uterine rupture in these different countries is the consequence of the lack of control of risk factors during pregnancy and delivery [32].

As for Bohoussou [32], Bayo [33] and Diouf [34], the frequency of uterine rupture increases with parity. Multiparity through histological changes of the uterine muscle can cause uterine rupture. To this is added a uterus weakened by a uterine scar. We are of the same opinion as Bohoussou [32], Bayo [33], Traoré [35] who found that the predisposition of multiparas to uterine rupture is a classic notion that deserves to be preserved by increased vigilance [25] [36]. Also, we have noticed the prevalence of uterine rupture among multiparas as in Burkina Faso [37], Ivory Coast [38], Iraq [39], and Benin [40].

During the study period, 1415 patients had an abortion out of a total of 27,441 inmates. Of these patients, 79 had an abortion complication. The frequency of

complicated abortion is 0.3% of the total number of patients, *i.e.* 1 complicated abortion for 347 patients. Complications of abortion were more common in multiparous women (57%).

In addition, 121 patients had ectopic pregnancy out of a total of 27,441 patients. The frequency of ectopic pregnancy was 0.4% compared to the total number of patients, *i.e.* 1 ectopic pregnancy for 227 patients. The incidence of ectopic pregnancy in our series is consistent with that of the literature which varies between 0.51% and 2%. For the study conducted in Senegal by Cissé [41], the incidence of ectopic pregnancy was estimated at 0.6 per 1000 expected pregnancies. Ndong [42] found a frequency of 0.8%. The ectopic pregnancy occurred more frequently in the multiparous (57%). Some authors [43] [44] [45] believe that nulliparity is a risk factor for ectopic pregnancy. But for Cissé [41], in 56% of cases there were patients having had at least 3 previous deliveries with an average parity of 3. For other authors such as Coste and al. [46], in France, there was no link between parity and the occurrence of an ectopic pregnancy.

5. Conclusion

The relationship between parity and the complications of pregnancy continues to be of interest to obstetricians. Some authors consider primiparity as a marker of risk; others have concluded that parity does not influence the outcome of pregnancy. Our study confirms that primiparity is a source of obstetric complications. However, some complications were more common in primiparity and others were more likely to occur in multiparas. We also recommend continuing this work by singling out multiparas and large multiparas, in order to better understand the obstetric prognosis linked to parity.

Ethical Considerations

The Dakar Teaching Hospital Ethical committee approved this study.

Conflicts of Interest

The authors declare no conflicts of interest.

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