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Original Research Article

Place of the antenatal care in the prevention of a premature delivery

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ABSTRACT

Background: Prematurity constitutes a source of morbidity and mortality neonatal. The objective of this study is to determine the place of the antenatal care in the prevention of a premature delivery.

Methods: It is an analytical retrospective study, type “cases-controls” realized at CHU GOB, on 01 January to 31 December 2014.

Results: The frequency of the premature delivery during the time of study was 6%. The risk factors significantly associated with the premature delivery were the primigestity, the primiparity and the antecedents of miscarriage. About the antenatal care, not followed pregnancy ($p=0.01$; OR=6.2; [IC 95% 1.3-29]), insufficient antenatal care ($p<10^{-10}$; OR=6.7; [IC 95% 4.0-15]) and the antenatal care carried out in the basic health center ($p=0.00002$; OR=3.5; [IC 95% 1.8-6.5]) influenced significantly with occurred of a premature delivery. While the realization of antenatal care 4 times and more and the realization of antenatal care at Universities Hospital Center protected the patients in occurred of a premature delivery.

Conclusions: The improvement of antenatal care's quality and the medical infrastructures at basic health center, as well as the sensibilization to the population on the importance of antenatal care constitutes a priority in order to prevent effectively occurred of a premature delivery.

Keywords: Antenatal care, Delivery, Premature, Fetal, Maternal, Prognosis

INTRODUCTION

Threatened preterm birth (TPB) is defined as the combination of cervical changes and regular, painful uterine contractions between 22 weeks of amenorrhea (SA) and 36 SA and 6 days.¹ It is one of the first causes of hospitalization during pregnancy and remains a major public health problem.² In fact, prematurity is a leading cause of neonatal death in the world with a perinatal mortality rate of 75%, especially in developing countries.³ In France, the incidence of prematurity was 6.3% in 2007.⁴ As for Madagascar, the rate of prematurity is estimated at

15.1% in 2010 of which 32% were very premature and 17.7% had a birth weight less than 1500g and the neonatal mortality rate is estimated at 25.9% related mainly to a large prematurity, a very low birth weight at 1500g and a poor Apgar score.⁵ One of the factors for the increase in this perinatal mortality rate was poor pregnancy follow-up.^{6,7}

Many risk factors contribute to the occurrence of preterm delivery.⁸ Prenatal consultation can identify these risk factors and prevent or manage a threat of preterm birth. Thus, the general objective of this study is to determine the

place of prenatal consultation in the prevention of preterm delivery at the University Hospital of Gynecology and Obstetrics of Befelatanana in Antananarivo.

METHODS

We had carried out a retrospective analytical study, type "case-control" carried out at the GOB University Hospital, from January 2018 to December 2018. We included as cases all pregnant women who had undergone ANC or not and who had delivered a live fetus prematurely, regardless of the delivery route. Controls were represented by patients with or without ANC who had delivered at term (gestational age ≥ 37 SA). We excluded from our study incomplete or unexploitable records, twin pregnancy, and premature rupture of membranes. We chose an exhaustive sampling mode.

The following variables were studied simultaneously for cases and controls: age of the woman, residence, marital status, occupation, gestational age, parity, gynecological history, quality of the ANC which is defined according to the follow-up; number of ANC performed; place and provider of ANC; prognosis of delivery: according to the mode of delivery and indication of the caesarean operation

Before the study was carried out, we obtained the agreement of the Director of the establishment within the GOB University Hospital to carry out the analysis. When processing patient records, confidentiality of the records as well as anonymity in the confidentiality and anonymity in the recording and processing of the data were respected.

The data were analyzed with Epi info software version 3.5.4. We retained a significant difference when the probability value p was less than 0.05. A factor with an odds ratio value >1 is considered a risk factor, whereas a factor with an odds ratio value <1 is considered protective. A confidence interval is 95%.

RESULTS

The total number of preterm deliveries during the year 2018 was 409 against 6475 of the total number of full-term deliveries. That is, the frequency of preterm delivery in

relation to the total number of deliveries during the year 2014 was 6%. Our study is composed of 113 cases and 226 controls.

The mean age of our patients was 24.9 ± 6.45 years with extremes of 15 and 45 years (Table 1). Women with preterm delivery were from suburban areas in 49% of cases. Women living in suburban areas were significantly at risk for preterm delivery with $p=0.0002$ and $OR=2.3$; 95% CI [1.4-3.8] (Table 1).

Illegitimately married patients were significantly at risk of preterm delivery with $p=0.007$; $OR=1.85$; [95% CI 1.12-3.04] (Table 1). The patients were housewives in 54% for cases and 46.40% for controls but without any significant difference between the two groups $p=0.12$ (Table 1).

Women who delivered prematurely were primigravida in 52.20%; $p=0.05$; $OR=1.47$; [CI 95% 0.9-2.3]. Primiparity was significantly associated with the occurrence of preterm delivery; $p=0.002$; $OR=1.98$; [CI 95% 1.2-3.2] (Table 1). The same was true for the history of spontaneous and induced miscarriage 11.9 1.7 [0.9-3.2] 0.04 (Table 1). Regarding the follow-up of the pregnancy. We observed that 3.5% of the cases had no pregnancy follow-up. The absence of pregnancy follow-up was relatively significantly associated with the occurrence of preterm delivery with $p=0.05$ and $OR=4.09$ [0.73-22.68] (Table 2). Patients who had performed less than 4 ANC or who had not performed ANC were significantly exposed to the occurrence of preterm delivery with a probability respectively at $p<10-10$ (6.7 [4.0-11] and 0.01 (6.2 [1.3-29]) (Table 2).

Regarding the place of pregnancy follow-up, there was a significant association between pregnancy follow-up in the CSBs and in other health centers other than the CHU or CHR and the occurrence of preterm delivery. On the other hand, the quality of the providers did not significantly influence the occurrence of preterm delivery (Table 2).

Regarding the mode of delivery, the majority of parturients delivered vaginally, 86.7% in the cases and 89.3% in the controls (Table 3). Fetal heart rhythm abnormality was the most frequent indication for cesarean delivery in cases compared with controls (Table 3).

Table 1: Characteristics epidemiological of patients.

Variables	Case	Controls	OR (IC 95%)	P
Age (year)				
<20	8 (7.1)	15 (6.7)	6.7 (0.44 – 2,6)	0.8
20-34	90 (79.6)	185 (82.2)	1	1
≥ 35	15 (13.3)	26 (11.1)	1.18 (0.5 – 2.3)	0.62
Home				
Rural	2 (1.8)	3 (1.3)	1.7 (0.2 – 11)	0.27
Suburban	49 (43.4)	56 (24.9)	2.3 (1.4 – 3.8)	0.0002
Urban	62 (54.9)	167 (73.8)	-	-
Marital status				

Continued.

Variables	Case	Controls	OR (IC 95%)	P
Not married	66 (58.4)	99 (43.8)	1.8 (1.1- 3.1)	0.007
Legally married	47 (41.6)	127 (56.2)	1	
Profession				
Housewife	61 (54)	105 (46.4)	1.3 (0.7 – 2.4)	0.12
Saleswoman or shopkeeper	23 (20.4)	53 (23)	1.03 (0.5 – 2.82)	0.4
Farmer	2 (1.8)	6 (2.6)	0.7 (0.1-4.19)	0.41
Workers in zone Franche	1 (0.9)	1 (0.4)	2.3 (0.1-39)	0.3
Others	26 (23)	62 (27.6)	1	38
	11 (9.7)	29 (12.8)	0.8 (0.4-1.9)	0.4
	43 (38.1)	102 (45)	1	
	59 (52.2)	95 (42.2)	1.47 (0.9-2.3)	0.05
Parity				
Primiparity	71 (62.8)	104 (45.8)	1.98 (1.2 – 3.2)	0.002
Pauciparity	34 (30.1)	99 (44)	1	
Multiparity	5 (4.4)	17 (7.6)	0.8 (0.2 – 2.4)	0.4
Big multiparity	3 (2.7)	6 (2.7)	1.45 (0.3-6.14)	0.3
Maternals history				
Preterm delivery and miscarriage	1 (0.9)	0	0	
Preterm delivery	2 (1.8)	0	0	
Miscarriage	21 (18.6)	27 (11.9)	1.7 (0.9-3.2)	0.04
Fetal death	1 (0.9)	0	0	
Any	88 (77.9)	199 (88.1)		

Table 2: Quality of the antenatal care.

Variables	Case	Controls	OR (IC 95%)	P
Antenatal care				
No	4 (3.5)	2 (0.9)	4.09 (0.73-22.68)	0.05
Yes	109 (96.5)	224 (99.1)	1	
Number of antenatal care				
0	4 (3.5)	3 (1.32)	6.2 (1.3 – 29)	0.01
1-3	72 (63.7)	50 (22.12)	6.7 (4.0 – 11)	<10-10
≥4	37 (32.7)	173 (76.54)	1	39
Place of antenatal care				
Other	36 (31.9)	59 (26.1)	3.05 (1.5-5.9)	0.0004
CSBII	56 (49.6)	80 (35.3)	3.5 (1.8-6.5)	0.00002
CHU ou CHD	17 (15)	85 (37.6)	1	
Any	4 (3.5)	2 (0.8)	10 (1.6-59)	0.006
Contractor of antenatal care				
Midwife	75 (66.4)	160 (70.7)	0.7 (0.1-4.2)	0.35
Doctor	32 (28.3)	61 (27)	0.7 (0.1-4.9)	0.39
Obstetrician	2 (1.8)	3 (1.3)	1	
Any	4 (3.5)	2 (0.9)	3 (0.2-35)	0.22

Table 3: Ending of pregnancy.

Variables	Case	Controls	OR (IC 95%)	P
Mode of delivery				
Cesarian delivery	15 (13.3)	24 (10.7)	1.28 (0.64-2.5)	0.24
Vaginal delivery	98 (86.7)	202 (89.3)		
Indication of the operation caesarean section				
Rhythm anomaly fetal cardiac	6 (5.3)	4 (1.7)		0.068
Pre-eclampsia or eclampsia	2 (1.8)	0		0
Dystocia	1 (0.9)	12 (5.3)		
Breech presentation for primiparity	4 (3.5)	1 (0.4)		

Continued.

Variables	Case	Controls	OR (IC 95%)	P
Other	2 (1.8)	7 (3.09)		
Vaginal delivery	98 (86.7)	202 (89.3)		

DISCUSSION

PAD is a clinical process leading to preterm delivery in the absence of treatment. It is currently a major public health problem. Indeed, according to the WHO, prematurity is the leading cause of death in newborns with more than one million deaths per year.⁹ The global preterm birth rate was estimated at 9.6% in 2005 according to the WHO, with approximately 85% concentrated mainly in Africa and Asia.¹⁰

Prematurity affected developing and underdeveloped countries more than developed countries. Indeed, this rate was 7.5% in Canada, 4.9% in France in 2000 and 10.5 to 12% in the United States.¹¹⁻¹³ This high rate compared to those of developed countries and the persistence of this accident could be explained by many factors such as the low socio-economic level, the lack of infrastructure, the insufficient rigorous monitoring of pregnancies in health centers but also the poor quality of ANC and by the presence of risk factors predisposing women to the occurrence of this premature delivery. In our series, the rate of prematurity at the CHU GOB in 2018 was 6% which seemed to be decreasing compared to a previous study by Rabesandratana et al in 2010 who had found a rate of 15.1%.⁵ But despite this, prematurity still remains a public health problem in our countries on vital, social and economic levels. The age of the patients in our study ranged from 15 to 45 years with an average age of 24.9±6.45 years. A study conducted by Schrestha et al in 2010 showed that 34.7% of the patients delivered prematurely were less than 20 years old and that this age constituted one of the risk factors associated with prematurity.¹⁴ Other authors such as Moutandou-Mboumba et al and Munyutu have realized that this age group constitutes one of the risk factors associated with prematurity.^{15,16} Nevertheless, this age group was not significantly related to prematurity in developed countries.¹² In France, Foix-L'Hélias et al, who evaluated the risk factors for prematurity in 2000, showed that maternal age at 35 years was a risk factor for prematurity.¹²

In our study, we found that unmarried women were significantly exposed to a risk of preterm delivery with $p=0.007$; OR=1.8; CI [95% 1.1-3.1]. However, other authors such as Ndiaye et al, in Senegal, did not find an association between marital status and the occurrence of preterm delivery.¹⁷ According to the study carried out in the USA by El-Sayed, prematurity was higher in married women than in single women.¹⁸ In the literature, lack of employment increased the risk of prematurity.^{19,20} This situation constituted a stress factor and anxiety for the women associated also with the socio-economic difficulties they were facing. This preoccupation of these women could be a factor of negligence for the follow-up

of pregnancy, which would favor a threat of premature delivery and then premature birth in the absence of rapid effective prevention. In our series, half of the patients (54%) who delivered prematurely were housewives, and saleswomen were the second most common with 20.4% of cases, but were not significantly associated with a risk of prematurity.

A gestational age <3 was a risk factor for preterm delivery that Ndiaye et al highlighted in their studies conducted in Senegal in 2005.¹⁷ The same results were found in our study with a relatively significant difference. Indeed, 52.20% of the patients who delivered prematurely were primigravida with a mean gestational age of 1.92±1.24 and extremes of one and seven; $p=0.05$; OR=1.47; [CI 95% 0.9-2.3].

In our study, we found 62.8% of primiparous women who were exposed to preterm delivery with a significant risk, $p=0.02$; OR=1.98; [CI 95% 1.2-3.2]. This could probably be related to low maternal age (teenage mother), marital status (single mother), lack of awareness of the importance of pregnancy monitoring and unfavorable socioeconomic conditions. This fact was also found in studies by some authors who reported that primiparity was a risk factor for preterm delivery.¹⁹

On the other hand, other authors have pointed out in their studies that it was multiparity that was significantly associated with prematurity, whereas primiparity was a protective factor.¹² In France, Foix-L'Hélias et al found that nulliparity was associated with preterm birth.¹² This could be explained by stress or psychological disorders due to the new adaptations caused by physiological changes in the woman related to pregnancy.

In the literature, several studies have shown that women with a history of miscarriage are at greater risk of preterm delivery. This required a very close, regular and adequate follow-up of the pregnancy. Moutandou-Mboumba et al, in 1998, in Gabon found that a history of abortion was significantly related to the risk of preterm delivery. In their study, 44.25% of women who delivered prematurely had a history of abortion.¹⁵ As well as Foix-L'Hélias et al, had also in their studies carried out in France, they underlined that obstetrical history, including abortion, was one of the risk factors significantly linked to prematurity.¹² The same findings were also found in our study. Indeed, preterm delivery concerned 18.6% of patients with a history of spontaneous or induced miscarriage with a relatively significant difference; $p=0.04$; OR=1.7 and [CI 95% 0.9-3.2].

Regarding the quality of antenatal care, more than one in ten babies worldwide is born prematurely and each year

more than one million children die as a result of complications related to preterm birth.⁹ Non-attendance and poor prenatal care are an increased risk of preterm birth.²¹ In developed countries, the rate of unattended pregnancies is around 1 to 3%.²² In France, this rate was 3.6% in a Parisian center in 1993.²³ The prenatal consultation constitutes a set of preventive and curative activities carried out in pregnant women. Its objective is to prevent, to detect early the risk factors of pregnancy and to manage the possible complications that could affect the health of the mother and the child to be born. In the literature, patients who did not undergo ANC were found in 32.5% of the cases of patients who had given birth prematurely in Bamako.²³ Mvondo Nicole in her study carried out at the Yaoundé Gyneco-Obstetric and Pediatric Hospital in 2011 identified that not monitoring the pregnancy increased the percentage and risk of prematurity.²⁵ In our series, this fact was also found. Indeed, the absence of pregnancy follow-up had a relatively significant influence on the occurrence of preterm delivery with $p=0.05$; $OR=4.09$ with [95% CI 0.73-22.68]. On the other hand, Letaief et al stated that not following pregnancy was not a risk factor associated with prematurity and low birth weight.²⁶ The absence of pregnancy monitoring could be explained firstly by the lack of information and education of the population in all areas, especially in suburban and rural areas, and secondly by the lifestyle of the population, the low socio-economic standard of living and the low level of education. For this reason, it is really necessary to reinforce this information and education on the need for ANC, to expand the health infrastructure, especially in rural areas, which is a factor influencing whether or not a pregnancy is followed. Finally, changing the behavior of each population is very useful.

For the number of ANC, due to major complications related to preterm birth, WHO has recommended at least eight ANC from the beginning to the end of the pregnancy. Meda et al pointed out that inadequate prenatal care is a risk factor for preterm birth Prazuck et al, Ndiaye et al had the same finding that the number of ANC less than 3 times was a predictive factor of prematurity or a significantly high risk of prematurity. In our study, 63.7% of the patients had performed less than 4 ANC and 3.5% had not performed ANC. These patients were at significant risk of preterm delivery with a probability of $<10^{-10}$; $OR=6.7$; [95% 4.0-11] and 0.01; $OR=6.2$; [95% 1.3-29] respectively.^{17,27,28}

While patients who performed 4 or more ANC were protected against the occurrence of preterm delivery. For this reason, the recommendations for pregnancy monitoring must be known by the whole population and must be put into practice.

In our study, we also found that 32.7% of the patients who delivered prematurely had performed ANC. This fact was confirmed by Letaief et al who noted in their studies that it

was not the number of ANC that seemed to be important but rather the quality of the pregnancy follow-up.²⁶

In this case, this could undoubtedly be influenced by the poor quality of monitoring and the problem of early detection of high-risk pregnancies due to the incompetence or negligence of health workers, particularly with regard to the detection and prevention of high-risk pregnancies, by the lack of health infrastructures and by the lack of information and education of pregnant women. Thus, to avoid the harmful consequences likely to result for the mother and the newborn due to the lack of monitoring or poor monitoring of pregnancies, it would be necessary to: strengthen IEC or Information-Education-Communication for behavioral change within the community, such as informing parturients about the necessity and importance of ANC, the presence of signs of pregnancy danger and the risk factors for pregnancy.

We found that almost half of the patients included in this study had performed ANC in the CSBII (49.6%) and they were exposed to a significant risk of preterm delivery with $p=0.00002$; $OR=3.5$; [95% CI 1.8-6.5]. While performing ANC in a university hospital did not present a risk of preterm delivery. This could be related to the presence of categories of health personnel (obstetricians, resuscitators and anesthetists, assistant doctors, midwives, and support staff) forming a multidisciplinary team and the presence of adequate infrastructures for better management at the university hospital. This fact is consistent with the study by Anorlu et al in Nigeria, who found that ANC in small maternity hospitals without obstetricians increased the risk of preterm births.²¹ Therefore, women are best advised to come to hospitals for pregnancy monitoring, especially for women at risk of preterm birth or other conditions.

ANC providers play an important role in pregnancy monitoring.⁴⁸ In the case study, ANC providers were obstetricians, general practitioners, and midwives. Every pregnant woman should have access to skilled health personnel who are able to monitor delivery, detect possible complications early, and refer the patient urgently to a specialized facility if a complication occurs.²⁹ In the literature, a pregnancy followed by an obstetrician was a better monitored pregnancy.³⁰ This could be explained by a difference in the skill level of each provider, as an obstetrician is more specialized in obstetric care. However, in our series, the providers did not significantly influence the occurrence of preterm delivery. In order to decrease the incidence of preterm delivery, training of health care providers should be strengthened to improve their skills in obstetric care so that they can manage a pregnancy adequately.

The predominant route of delivery is vaginal delivery. In the literature, it was a significant risk factor for neonatal death ($p=0.02$).³¹ In our study, the majority of deliveries, whether preterm or full term, were by vaginal delivery with 86.70% and 89.30% respectively. This could be

explained by the fact that a premature baby had a low birth weight facilitating delivery.

The limitations of this study are that of a retrospective study in a study made on completed files sometimes incompletely or urgently, however, delivering data insufficient.

CONCLUSION

The frequency of this preterm birth in this study was decreasing compared to previous years with a rate of 6% during the year 2014 our study period but still remains a major public health problem in our countries. During this study, it was found that the epidemiological profile of the patients was almost identical to the one found in the literature. Regarding pregnancy follow-up, no ANC follow-up and poor pregnancy follow-up ($ANC \leq 3$) were associated with a significant risk of preterm delivery, and ANC performed in a CSBII and other than in a UHC were also associated with a risk of preterm delivery.

Our study was able to observe the importance of ANC with respect to the adverse effects associated with preterm delivery. It also allowed us to study the epidemioclinical factors and to look for risk factors for preterm delivery in order to prevent complications that could threaten the pregnancy or engage the maternal and fetal prognosis.

Following the harmful complications caused by this premature birth, the best pregnancy follow-up by ANC is the most ideal for the prevention of prematurity. Indeed, ANC allows early detection of risk factors that may complicate a pregnancy or threaten the life of the pregnant woman and the unborn baby in order to take preventive or even curative measures in time when a complication occurs.

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