

Influence of Prenatal Surveillance on Maternal and Perinatal Prognosis: A Prospective Study over 6 Months at the Maternity Ward of the Owendo University Hospital (Gabon)

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Abstract

Introduction: The occurrence of pregnancy in women is a risky situation. Prenatal care is necessary, which is not often the case in our context. **Aim:** To analyze the influence of antenatal surveillance on maternal and perinatal prognosis. **Patients and Method:** Preliminary longitudinal and analytical survey at the Owendo University Hospital (OHU) over 6 months. It focused on prenatal surveillance. The study population consisted of parturients who gave birth within 24 hours and we studied sociodemographic characteristics, variables related to antenatal contact, those of delivery as well as maternal and newborn outcomes. **Results:** 2485 deliveries were recorded and 1300 patients were retained according to the inclusion criteria. No prenatal contact (ANC0) was performed in 93 (7.15%), insufficient (ANCI) in 943 patients (72.5%), and sufficient (ANCS) in 264 patients (20.30%). Patients with low school level were significantly found when the NPC was not performed or insufficient and the same was true for the group of patients who were not employed and those who were single ($p < 0.005$). The caesarean section rate and perinatal mortality are high in this case. **Conclusion:** The quality of prenatal contact is insufficient in our context. The absence or inadequacy of the latter has a strong negative impact on maternal and perinatal morbidity and mortality.

Keywords

ANC, Insufficiency, Maternal Pathologies, Perinatal Death, Gabon

1. Introduction

Any pregnant woman should be considered at risk. However, pregnancy is a physiological condition. It extends from fertilization to the 42nd day after delivery. It is an event that allows women to value themselves, to assert themselves and to keep or consolidate their place within the family by giving birth to a newborn who is welcomed with joy and joy in society [1]. However, many women lose their lives or suffer complications such as anemia, bacterial and parasitic diseases, vasculo-renal damage and complications related to childbirth (haemorrhages) [2]. In our context, the woman still dies while giving birth. According to the 2012 and 2022 Demographic and Health Surveys (DHS) [3] [4], the maternal mortality ratio has not changed much (316 maternal deaths per 100,000 live births) and its figure is not far from those of other developing countries [5] [6] [7]. It is estimated that worldwide, every year, 4 million newborns die before they are 1 month old and another 4 million are stillborn (they die between the 22nd week of amenorrhea and birth), and 90% of these deaths occur in developing countries [8]. The majority of maternal and neonatal deaths could be minimized if, during pregnancy, women regularly observed antenatal contacts (ANC) and received appropriate antenatal care, if their delivery was attended by trained medical personnel, and if they received postnatal follow-up after delivery [8] [9]. A comprehensive and innovative approach that is well aligned with the Millennium Development Goals (MDG) and Sustainable Development Goals (SDG) [10]. In 2009, Mayi-Tsonga and other authors demonstrated the harmful effects of the absence of NPC on maternal and perinatal outcomes [11] [12] [13]. In our structure, the parturients come from several follow-up centres, the pregnancy is not often monitored and when this is the case, the prognosis of the delivery is not mentioned. This is what led us to make an assessment of the quality of the ANC and the maternal and perinatal prognosis in a referral maternity hospital on the outskirts of Libreville.

2. Patients and Method

This is a longitudinal and analytical preliminary inquiry. It was carried out in the maternity ward of the Owendo University Hospital (CHUO) in the period from July 1 to December 30, 2022, *i.e.* 6 months. It focused on prenatal surveillance and maternal and perinatal prognosis in a referral maternity unit. It carries out about 5000 deliveries per year and houses a neonatal unit with 5 incubators. Recruitment was exhaustive in the immediate postpartum period and the study population consisted of parturients who gave birth within 24 hours. We included those who gave birth to a pregnancy with a live child and agreed to voluntarily participate in the study. This allowed us to form 3 groups. The group with a sufficient number of antenatal contacts (ANCS), the group with an insufficient number of antenatal contacts (ANCI) and the group for those with no antenatal contact (ANC0). ANC was considered sufficient when the patient had made at least 5 contacts with antenatal check-up and comprehensive preventive care. It was considered insufficient when the patient had made fewer than 5

contacts with an antenatal check-up and incomplete preventive care. The prenatal check-up used in our context consisted of: a complete blood count (CBC), a blood grouping with phenotype (complete Kell's Rh ABO), hemoglobin electrophoresis, serologies for toxoplasmosis, rubella, syphilis and those for hepatitis B and C. Then the monthly urine dipstick (albuminuria and glycosuria test), retroviral serology (VRS) and 3 obstetric ultrasounds. Counselling was tetanus vaccination, intermittent preventive treatment for malaria with sulfadoxine pyrimethamine (SP), folic acid and iron. We excluded from the study all those who refused to participate as well as those who were discharged early from the maternity ward. Recruitment was carried out on a daily basis and the investigation protocol consisted of an interview, a reading of the contact book, the partogram, the physical file, the register of deliveries, that of the operating theatre and the neonatal unit. This protocol included socio-demographic parameters, pregnancy monitoring, mode of delivery, and maternal and perinatal outcomes. Thus, thanks to an individual data collection sheet, the following variables were studied: socio-demographic characteristics, parity, variables related to prenatal contacts (the place of follow-up, the provider, the number of ANC, the paraclinical assessment and the care provided), pathologies during pregnancy, variables related to childbirth (term, the route of delivery, the indication for caesarean section), maternal fate and that of the newborn (APGAR score, weight, stay in neonatal intensive care and perinatal death). Data were entered using Microsoft® Excel software. Statistical analysis was performed using Epi info™ 6 software (version 6.4). Results were expressed as a percentage for qualitative variables and as an average \pm standard deviation for quantitative variables. These variables were compared with each other using the Chi2 test, the Yates-corrected Chi2 (n between 3 and 4) and the Fisher exact test (n < 3). The difference was considered significant for a p-value < 0.05.

3. Results

During the study period, 2485 deliveries were recorded and 1300 patients were retained according to the inclusion criteria. No prenatal contact (ANC0) was performed in 93 (7.15%), insufficient (ANCI) in 943 patients (72.5%) and sufficient (ANCS) in 264 patients (20.30%). The mean age of patients was 28.95 ± 7.02 with ranges from 15 to 43 years. The 21 to 30 age group accounted for 40.7% and was significantly found when the ANC was insufficient or not done ($p < 0.000$). Patients with low school level were significantly found when the ANC was not performed or insufficient and the same was true for the group of patients who were not employed and those who were single ($p < 0.005$). The mean parity was 2.3 ± 1.2 with extremes of 1 to 8 paires. Multiparous were significantly found when ANC was not achieved or insufficient ($p < 0.001$). All of these results are shown in **Table 1**.

3.1. Prenatal Contact

Pregnancy was often unwanted (78%) and ultimately accepted. For all patients,

Table 1. Socio-demographic parameters.

Paramètres	N (1300)			p
	ANC0 n (%)	ANCI n (%)	ANCS n (%)	
Age (ans)				0.000
15 - 20	6 (6.5)	158 (16.7)	36 (1.,6)	
21 - 30	78 (83.9)	412 (43.8)	40 (15.2)	
31 - 40	7 (7.5)	348 (36.9)	170 (64.4)	
+40	2 (2.1)	25 (2.6)	18 (6.8)	
Educational attainment				0.000
Illiterate	0 (0)	1 (0.1)	0 (0)	
Primary	5 (5.4)	75 (7.9)	7 (2.6)	
Secondary	80 (86)	717(76)	137 (51.9)	
Upper	8 (8.6)	150 (16)	120 (45.5)	
Profession				
Official	0 (0)	62 (6.5)	80 (30.3)	
Without	89 (95.6)	784 (83.2)	110 (41.7)	
Private sector	4 (4.4)	97 (10.3)	74 (28)	
Marriage Situation				0.322
Bachelor	92 (98.9)	834 (88.4)	125 (47.3)	
Married	1 (1.1)	109 (11.6)	139 (52.7)	
Parity				0.001
1	5 (5.4)	135 (14.3)	73 (27.7)	
2 - 4	85 (91.4)	791 (83.9)	183 (69.3)	
≥5	3 (3.2)	17 (1.8)	8 (3)	
Total	93 (100)	943 (100)	264 (100)	

when the NPC was performed, the 1st was done in the 2nd trimester of pregnancy in 740 patients (56.92%) and the last in the 3rd trimester in 1173 patients (90.23%). The maternal and child care centre (MCC) was the place where pregnancy was monitored in 75.82% of cases and the Libreville University Hospital 24.94% of cases. The main provider was the midwife (74%) and the doctor (26%). Check-up and antenatal care were carried out in 72.38% of cases. For all these parameters, no significant difference was found between the 2 groups ($p = 0.341$).

3.2. Pathologies Associated with Pregnancy

During pregnancy, for all groups, no pathology was found in 604 cases (46.46%). When present, hypertension was found in 304 cases (43.67%), malaria and anaemia in 259 cases (37.21%) and urinary tract infection in 60 cases (8.62%). The discovery of pathology was closely related to increased monitoring of pregnancy and the occurrence of pregnancy when there was insufficient or no monitoring ($p = 0.000$).

3.3. Childbirth

The gestational term at delivery was less than 38 weeks in 371 cases (28.5%) for all patients. Of these, 362 (97.5%) were from the ANC0 and ANCI groups versus 9 cases (2.5%). For the delivery route, caesarean section was found in 87 cases (93.6%) when the ANC had not been performed compared to 34 cases (13%) when it was sufficient. In this case, the main indications were fetopelvic disproportions (22.2%), followed by pre-eclampsia (14.5%) and retroplacental hematoma (3.8%). The aftermath of childbirth was simple in 94.6% of cases and no maternal deaths were recorded. For vaginal delivery, no significant differences were found between the different groups studied (**Table 2**).

Table 2. Pregnancy and childbirth parameters.

Parameters	N (1300)			P
	ANC0 n (%)	ANCI n (%)	ANCS n (%)	
Gestational age (GA)				0.001
28 - 37	92 (98.9)	270 (28.6)	9 (3.4)	
38 - 41	1 (1.1)	671 (71.2)	255 (96.6)	
42	0 (0)	2 (0.2)	0 (0)	
Pathologies and pregnancy				0.000
No pathology	62 (66.7)	366 (38.8)	181 (68.6)	
High blood pressure	3 (3.2)	297 (31.5)	4 (1.5)	
Anemia	5 (5.4)	167 (17.7)	1 (0.4)	
Malaria	4 (4.3)	42 (4.5)	40 (15.2)	
Urinary tract infection	13 (13.9)	21 (2.2)	36 (13.6)	
Threat of preterm delivery	0 (0)	30 (3.2)	0 (0)	
Other pathologies	13 (14)	20 (2.1)	2 (0.7)	
Childbirth				0.000
Low Track	6 (6.4)	435 (46.1)	230 (87.1)	
High Track	87 (93.6)	508 (53.9)	34 (12.9)	
Layer suites				0.000
Simple	46 (49.5)	923 (98)	254 (96.2)	
High blood pressure	28 (30.1)	8 (0.8)	6 (2.3)	
Anemia	12 (12.9)	8 (0.8)	4 (1.5)	
Suppuration	1 (1.1)	1 (0.1)	0	
Haemorrhage	6 (6.4)	3 (0.3)	0	
Maternal Death	0	0	0	
Total	93 (100)	943 (100)	264 (100)	

3.4. Maternal Morbidity and Mortality

At the time of delivery, no complications were found in 980 parturients (75.34%). When this was present, 69 cases (74.2%) were found in the ANC0 group versus 17 cases (6.4%) in the ANCS group. Renal vasculoskeletal pathology and obstetric haemorrhage were the main complications found. Postpartum was simple in 1230 cases (94.6%) and complications as well as stay in intensive care were significantly found when ANC was absent ($p < 0.000$). Hypertension, anaemia, haemorrhage and suppuration of the walls were the main complications. There were no maternal deaths (Table 3).

3.5. Perinatal Morbidity and Mortality

The mean APGAR was 7 ± 2.1 [0 - 10], we found no significant difference for this parameter or for the stay in neonatal intensive care between the study groups ($p = 0.372$). Respiratory distress and induced prematurity (29.09%) were the reasons for admission. Twenty (1.5%) newborn deaths were recorded and this was found in 18 cases (90%) when the ANC was absent or insufficient ($p = 0.000$).

4. Discussion

Our study uncovered our shortcomings in terms of managing pregnancy supports. Before delivery, pregnancy monitoring parameters are often incomplete, including weight, blood pressure, and many others such as the notion of previous hospitalization as well as obstetric history. During childbirth, the forensic support partogram for the monitoring of labour is not usable because it was incorrectly filled in, as was the case for physical records. In addition, as the capacity of the maternity ward was limited, some of the persons meeting the inclusion criteria had been referred to other facilities for lack of places, as well as newborns. This observation had already been made by Mayi-Tsonga et al in 2009 in Libreville [11]. This set of annoyances considerably weakened our sample (1300/2455).

Table 3. Fetal morbidity mortality.

Parameters studied	N (1300)			P
	ANC0 n (%)	ANCI n (%)	ANCS n (%)	
APGAR				
<3	0 (0)	10 (1.1)	6 (2.3)	
3 - 6	13 (13.9)	156 (16.5)	44 (16.6)	
≥ 7	80 (86.1)	777 (82.4)	214 (81.1)	0.372
Condition of the newborn				
Alive	85 (91.4)	933 (99)	262 (99.2)	0.341
Death	8 (8.6)	10 (1)	2 (0.8)	0.000
Total	93 (100)	943 (100)	264 (100)	

Add to this the monocentric nature of our study, hence its limitations. Nevertheless, our recruitment is appreciable, which allowed us to make a number of observations. In our environment, the majority of pregnancy is monitored by the midwife (74%). A tiny portion by doctors and the delivery is done in a hospital environment with 100% coverage by the health insurance and social guarantee fund (HISG). In this context, we did not consider it useful to integrate structural parameters into our study as in some studies [12] [13] [14]. In this equipped setting, 264/1300 (20.3%) patients had adequate ANC and 93/1300 (7.15%) had no prenatal contact. The prenatal follow-up rate is 92.85%, which is appreciable and not far from the national trend. Indeed, according to the 3rd Gabon Demographic and Health Survey 2019-2021 (DHS-III), more than 9/10 (96%) received antenatal care provided by a qualified health provider during the pregnancy of their most recent birth [4]. This figure has not varied much, it was 95% in 2012 [2]. In Congo Brazzaville and Burkina Faso, identical figures have been reported [5] [6]. This comforts us because the use of antenatal care has a positive impact on the outcome of pregnancy as well as the use of assisted delivery [8] [9] [15]. In our series, 93 patients (7.15%) had no ANC. Our results are close to those of Moussa Telly M (6.9%) [16], but lower than those of Sangala M and Amani Maleya (28.7 and 21.23%) [13] [17]. Our figure is encouraging. This is a reflection of an increase in the rate of ANC in our country. Free health care and the proliferation of health centres are the manifestation of this trend. In this group, the 21 - 30 age group is the most represented (83.9%). These results are similar to those of other authors [11] [12] [13] [17]. Young age appears to be an obstacle to attendance at health centres. The same was true for downward educational attainment, unemployment and celibacy. This is a national trend in view of the 2021 DHS. In practice, in our context, for pregnant women, care is complete until delivery. Age or lack of resources should not be a factor in attendance at health centres. Awareness-raising and information campaigns should be intensified in this regard. In addition, the WHO and learned societies are multiplying recommendations for the accessibility and multiplication of health centres in low-income countries [2] [8] [12] [18]. For obstetric history, only parity was explored. The 2 to 4 pares range was significantly found when the ANC was insufficient or not done ($p < 0.001$). Thus, multiparity seems to us to be an obstacle to prenatal care. Looking at the literature, it seems clear that women with more than 4 pregnancies tend to neglect pregnancy follow-up centers. El Hamdani and MH Mustafa in their study observed that the level of ANC decreases as parity increases significantly [19] [20]. Some series had recorded a high number of primiparous [21] [22] and Amani Maleya [17] did not find a difference for this parameter. For us, the prognosis of childbirth is not related to the number of pregnancies or the number of previous deliveries. In our study, when the ANC was performed, 56.9% of parturients had consulted the 1st time in the 2nd trimester of pregnancy. To be effective, antenatal care must begin at an early stage of pregnancy and continue with some regularity until delivery, with a trained health care provider. WHO recommends at least 4 antenatal visits and eight

contacts. The first visit should take place before the third month of pregnancy [8] [15]. Pregnancy is often declared late in our context. For socio-cultural reasons, pregnancy can only occur when it can be seen and can therefore no longer be hindered. As in several countries in the sub-region [5] [6] [7], the main provider is the midwife (74%) followed by the doctor (26%). Not the matrons. The involvement of physicians in our series is appreciable. According to the WHO, the 1st prenatal contact must be made by a doctor to confirm the diagnosis of the pregnancy and to manage the one that involves risk [8]. No pathology was found in 604 cases (46.46%) vs. 696 (53.54%). The discovery of a pathology was closely related to increased monitoring of pregnancy and the occurrence of pregnancy was significantly found when monitoring was insufficient or non-existent. As in the series of T Kone and that of Fomba D [14] [23], hypertension was the main pathology found (43.7 vs. 38%) and as in our series malaria in the context of anaemia (37.7 vs. 22%). These pathologies can be prevented and managed if women regularly observe ANC during which preventive care is applied. Caesarean delivery was significantly found when the ANC was absent or insufficient. Results similar to those of T Kone [23]. The lack of check-ups, the high rate of pathologies associated with pregnancy and the electronic monitoring of labour may explain this trend in our context. In the series of Amani Maleya et al, no significant difference was for the route of delivery regardless of the quality of the ANC [17]. When the sequences of layers were simple, no difference was found regardless of the quality of the ANC. Like other authors, the predominance of postpartum complications was related to no or poor monitoring of pregnancy [17] [19] [20]. For the newborn, the quality and quantity of ANC did not influence adaptation to ectopic life ($p = 0.372$). The majority of newborns had a satisfactory Apgar score (73%), especially when it was above 7. In the thesis of Mr. Bakary Dianko Dembélé as well as for other authors, it seems clear that the absence of the ANC is not a risk factor for alteration of the APGAR score [17] [24] [25]. The common reason for admission to neonatology in our series is related to induced prematurity (29.09%). This is a source of respiratory distress and neonatal infection. All of our results can be superimposed on those of the literature [25] [26] [27] [28] and are in line with those of the DHS II [3] where the majority of unattended pregnancies in our country result in a high rate of prematurity. This is the explanation for the non-negligible rate of perinatal deaths in our context (1.5%). Although small but significant, compared to those in the sub-region [28] [29] [30], it is the consequence of the deficit of ANC and the lack of space for the care of very premature infants. The rate of maternal death remains high in our country according to various surveys [3] [4]. At Owendo University Hospital, no pregnancy-related deaths were recorded during this period.

5. Conclusion

At the end of this study, it emerged that the quality of prenatal contact among parturients who came to give birth at the OUH maternity ward was insufficient.

This is likely a reflection of the quality of ANC in our country, and the advent of free antenatal care and childbirth does not seem to reverse this trend. Populations with a low social and economic level, singles, lack of education and multiparous people are the most affected. This situation has a negative impact on the course of pregnancy, the mode of delivery and maternal and perinatal morbidity. In our context, almost all deliveries are carried out with qualified personnel and in approved health centres. To this end, the active participation of public authorities through audio-visual campaigns, awareness-raising during hospitalization or childbirth by health providers, the contribution of school educators as well as each individual in society can be an essential contribution to improving this inadequacy.

Conflicts of Interest

The authors declare that they have no ties of interest.

Authors' Contribution

B. Sima Ole, S. G. Mba Edou and U. Minkobam designed the research protocol and wrote this manuscript. Mounquengui, D. Assoume, P. Assoumou collected the data. J.A. Bang Ntamack, S. Mayi Tsonga, and J. F. Meye gave shape to this manuscript. All authors approved the final version of this manuscript.

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