

Rate of Obstetrical Complications and Medical Interventions in Low-Risk Patients: A Cohort Study in Dakar, Senegal

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Abstract

Background: “Low-risk” pregnancy is defined as a pregnancy that develops physiologically in a healthy woman and remains healthy. In practice, “low-risk” pregnancies are defined by excluding high-risk pregnancies. **Objectives:** Evaluate the rate of complications and medical interventions in “low-risk” pregnant women. **Methods:** This was a retrospective cohort study assessing the risk of obstetrical complications and medical interventions in low-risk patients from January 2010 to December 2020 at Philippe Maguilen Senghor Health Center in Dakar, Senegal. **Results:** There were 10,979 low-risk patients out of a total of 52,768, accounting for 20.8%. As medical interventions, episiotomy was performed in 27.5% and cesarean section in 8.7%. Acute fetal distress was observed in 4.1%. A low Apgar score at the fifth minute was observed in 1.89% (whereas it was 3.49% in high risk patients). Newborn-resuscitation was performed in 10.7%. Neonatal mortality was 5‰. **Conclusion:** Low-risk pregnancies are not without “risk”, and thus care-givers should prepare for risks even at dealing with low risk patients.

Keywords

Risk, Delivery, Obstetric Complications, Senegal

1. Introduction

According to the World Health Organization (WHO) a normal birth is “a birth that is spontaneously induced, with low risk from the beginning and through-

out labor and delivery. The baby is born spontaneously in the cephalic position at 37 - 42 weeks of gestation. After birth, both mother and newborn are well” [1].

The French High Authority for Health (HAS) defines low-risk pregnancy as a pregnancy whose evolution is physiological in a healthy woman [1] [2]. This notion of risk is to be evaluated early, if possible, in the pre-conceptional period and then throughout the pregnancy. In order to define the risks associated with pregnancy and childbirth for the mother and child, several classifications have been established.

Classifications make it possible to assess the level of risk and the type of monitoring for each pregnancy, based on the identification of potential risk factors such as [2] [3] [4] [5]: risk factors and causes of maternal morbidity and/or mortality, fetal, maternal, obstetric risk factors and causes of perinatal morbidity and/or mortality; anomalies, genetic conditions, environmental and infectious factors and other risk factors involved in congenital anomalies.

These principal classifications are [3]: “Antenatal care: routine care for the healthy pregnant women” established by the National Institute for Clinical Excellence (NICE), “Verloskundig Vademecum”, as recommended by the National Health Insurance Board of the Netherlands (NHIBN); “National Recommendation on Antenatal Care: a basis for a clinical pregnancy care itinerary”, developed by the Federal Centre for Expertise in Health Care (CFESS) in 2004.

Several authors have already evaluated the obstetrical and neonatal prognosis of high-risk pregnancies but what about low-risk pregnancies?

A study by SelviDogan in France on the risk of complications in low-risk pregnancies showed that there was an increase in the management of these patients and concluded that 37% of patients classified as low-risk at the beginning of labor required a call to the obstetrician and 21% of these required medical interventions [6].

It is in this context that we conducted this study with the main objective of evaluating the risk of obstetrical complications and medical interventions in low-risk patients.

2. Methods

Type of Study

This is a cohort study assessing the risk of obstetrical complications and medical interventions in low-risk patients.

Period of Study

This is a ten-year study from January 2010 to December 2020.

Setting

All patients who delivered at the Philippe Maguilen SENGHOR health Center, regardless of risk level, and whose records were correctly registered in our database were included in the study.

Participants

Patients of “low-risk” should satisfy the following criteria: maternal age between 18 and 35 years, single fetal pregnancy, absence of uterine scar, gestational age between 37 and 40 weeks + 6 days, vertex presentation, absence of maternal-fetal pathologies associated with the pregnancy, admission from home.

All patients outside this definition were automatically classified in the “high-risk” group.

Variables

For this study, we analyzed maternal characteristics, labor and delivery outcomes, and neonatal prognosis for each group.

For the maternal characteristics, we evaluated age and parity in the two groups in a comparative way. Regarding the obstetrical and neonatal prognosis, we evaluated progress of labor, fetal well-being before delivery, including the occurrence of anomalies of the fetal cardiac rhythm during labor, rate of obstetrical complications, 5-minute Apgar score (score of less than 7 at the fifth minute was considered as “low”), proportion of newborns who underwent neonatal resuscitation, rate of maternal and neonatal death.

Data Sources

The parameters were collected into our computerized database. Data extracted from our database were analyzed using Microsoft Excel and Statistical Package for Social Science (SPSS) software 26.

Statistical Methods

Descriptive statistical analyses were carried out on the continuous quantitative variables to determine their position and dispersion parameters. We calculated the frequencies of the categorical or qualitative variables.

To identify the association between the outcomes and the independent variables, a bivariate analysis was performed.

The significance level was set to 5%.

3. Results

Frequency

A total of 10,979 patients satisfied the criteria for the “low-risk” group out of a total of 52,768, corresponding to 20.8%.

Socio-Demographic Data

Patients in the “low-risk” group were moderately younger with a statistically significant difference (26.12 vs. 27.7, $p < 0.001$).

Multiparous women were more at risk of belonging to the “high-risk” group (53.1% vs. 64.4%; $p < 0.001$).

Delivery Data and Neonatal Outcomes

Regarding medical interventions during delivery, there was a statistically significant difference between the two groups, with three times fewer caesarean sections in the low-risk group (8.7% vs. 26.4%; $p < 0.001$).

However, there was a higher proportion of episiotomies in the “low-risk” group (27.5% vs. 16.6%; $p < 0.001$).

Patients in the high-risk group were twice as likely to have dystocia during labor or postpartum hemorrhage.

The same was true for perinatal outcomes such as acute fetal distress with rates of 4.1% for the reference group vs. 5.9% for the control group, Apgar score at the fifth minute (1.89 vs. 3.49; RR: 1.869; $p < 0.001$), newborn resuscitation (10.7% vs. 19.5%; RR: 2.008; $p < 0.001$) and stillbirth (5‰ vs. 42‰; $p < 0.001$).

Maternal and fetal outcomes are summarized in **Table 1**.

Table 1. Sociodemographic aspects and delivery data according to risk level.

Variable	Low risk %	High risk %	RR (CI)	p-value
Socio-demographic data				
Age (year) median*	26.12	27.7	-	<0.001
Multiparous (%)	53.1	64.4	-	<0.001
Medical interventions				
Caesarean section	8.7	26.4	-	<0.001
Episiotomy	27.5	16.6	-	<0.001
Obstetrical complications				
Dystocia	3.2	7.3	2.376 (2.125 - 2.657)	<0.001
Postpartum haemorrhage	0.15	0.38	2.478 (1.503 - 4.088)	<0.001
Maternal death	0.009	0.11	-	<0.001
Neonatal outcomes				
Fetal weight (g)	3115	2989	-	<0.001
Acute fetal distress	4.1	5.9	1.461 (1.318 - 1.618)	1 < 0.001
Apgar score < 7 (%)	1.89	3.49	1.869 (1.613 - 2.167)	<0.001
Neonatal resuscitation (%)	10.7	19.5	2.008 (1.879 - 2.147)	<0.001
Stillbirth (‰)	5	42.3	-	<0.001

RR: Relative Risk; CI: Confidence Interval.

4. Discussion

Main Results

Over 11 years (2010-2020), 10,979 “low-risk” pregnancies were managed out of a total of 52,768 patients leading to a frequency of 20.8%.

This study suggests that the classification of high and low obstetrical risk is relevant, with high risk patients being more likely to present obstetrical complications

and to undergo caesarean section. However, low-risk pregnancies are not without obstetric complications and medical interventions during labor.

Our study demonstrates the importance of comprehensive management of pregnancies regardless of risk level.

Interpretation of Results

The average age of the patients included in the study was 26.12 years in the “low-risk” group and 27.7 years in the “high-risk” group.

These results are similar to what is reported by the majority of authors with an average age that is always higher in the “high-risk” group of patients [6] [7] [8].

We find a significantly higher rate of multiparous patients in the “high-risk” group (64.4% versus 53.1%, $p < 0.001$). This difference can be explained by the fact that high parity in itself a risk, given that the more pregnancies a person has, the greater the risk of having a pregnancy with obstetrical or neonatal complications that will automatically classify the patient as “high risk” in future pregnancies.

With respect to medical interventions, a caesarean section was performed in 8.7% of “low risk” pregnancies, three times less than that of “high risk” pregnancies. However, this rate is still higher than the national rate of caesarean sections, which is around 5% [6] [9].

On the contrary, episiotomy was more frequent in the “low-risk” group (27.5% vs. 16.6%). The higher rate of episiotomy in this group may be explained by the fact that there were more primiparous women in this group and it has been shown that primiparity itself is a risk factor for episiotomy at the time of delivery.

Whatever the group, episiotomy rates were much higher than what was reported in the literature: 14.4% in Geoffroy’s study and 5.1% depending on the level of risk. This demonstrates the need to review this practice and our indications in order to explain the significant difference between our results and those found in the literature [7].

For obstetrical and neonatal complications which, even if they were found more frequently in “high-risk” pregnancies, were also present in “low-risk” pregnancies. Indeed, 3.2% of dystocia and 4.1% of acute fetal distress were found at the time of delivery. 1.89% of newborns had a 5-minute low Apgar score, 10.7% required neonatal resuscitation and 5 neonatal deaths per thousand births. These results are similar to those found in the few studies of “low-risk” pregnancies [7] [8] [10].

Put together, our results demonstrate that whatever the initial assessment during pregnancy and in early labor, “low-risk” pregnancies are not without complications, even if these complications are found at a lower rate.

Implication of Results

This study offers several avenues for research. Indeed, questions must be asked about the validity of this classification of “high-” or “low-risk” pregnancies in our regions. In addition to the elements allowing this classification, it would be necessary to include elements related to the place of residence, working condi-

tions, access or not to quality care centers. For some patients, even if they are potentially classified in the “low-risk” pregnancies group, not having access to quality obstetric care at the time of onset of labor fall into the high-risk group.

For public health, the fact of screening patients at the end of their pregnancy and orienting them for the management of their delivery would make it possible to relieve the referral centers but also to reduce the rate of patients evacuated most often in an obstetrical or neonatal emergency situation.

Strengths and Limitations of the Study

This study took place in a facility with the highest volume of activity in Dakar suburbs and the largest computerized database including more than 50,000 patients to date.

We can also add that the maternity hospital also has an educational vocation, which makes it a reference center.

In addition, this study proposes a different approach from what has been done so far in Africa and in the world with criteria defining a “low risk” pregnancy listed very precisely. Also, the majority of studies evaluating pregnancies according to risk level have focused on “high risk” pregnancies.

However, this was a retrospective study. It therefore presents biases inherent to this type of study. Indeed, the data was collected using the patients’ computerized file. This results in a possible biased reporting of data and transcription of events during pregnancy and labor.

In addition, our inclusion criteria in the “low risk” group were very precise and more restrictive than those of some studies, which necessarily influenced our ratio of “low risk” to “high risk” patients.

5. Conclusion

Low-risk pregnancies are not without “risk”. The risk level classification should be reassessed and contextualized to our population.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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