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Original Article

Intervention of the obstetrician during childbirth in a supposedly low-risk population and influence of parity

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ABSTRACT

Objective. – Compare obstetrician intervention and calling rates during labour and delivery between low-risk and high-risk women and study the influence of parity on these rates.
Material and methods. – Descriptive retrospective study conducted on 227 patients in a university maternity unit (level 3 university hospital maternity unit) between 1st and 30th January 2014. The low- and high-risk populations were characterised according to the French National Authority for Health (HAS) and NICE guidelines. The obstetrician intervention criteria were: Caesarean section, instrumental vaginal delivery, artificial delivery/uterus examination and postpartum haemorrhage. The obstetrical team also had to call the obstetrician in case of foetal heart rate abnormalities, scalp blood pH measurement, third and/or fourth degree perineal tears, labour dystocia, or any other severe event occurring during labour or delivery.
Results. – In univariate analysis, the obstetrician intervention rates were respectively 44.5% and 34.4% in the high- and low-risk groups ($P = 0.13$). The obstetrician calling rates were similar between the two groups. Using logistic regression model including parity, the obstetrician intervention rate became significantly higher in the "high-risk" group (OR 2.044, 95% CI 1.129–3.703, $P = 0.018$). In the low-risk population, the intervention rate was significantly increased for nulliparous women compared with multiparas (47.5% versus 9.7%, $P < 0.001$, OR = 8.2, CI 95% 2.2 to 46.9).
Conclusion. – One third of the women defined as low-risk patients appear to need an obstetrician intervention during labour and delivery, with a major influence of parity.

Introduction

The last few years have seen an increase in the number of women requesting the possibility of giving birth in a less medicalised environment and to develop physiological birth spaces and birth centres in France. User associations are multiplying to defend these trends but health professionals are reluctant since their priority is to guarantee the same level of safety for women and their unborn child in these spaces as in conventional structures [1].

In other European countries, especially the Netherlands and England, recommendations for clinical practice have been put forward for the last ten years or so regarding assessment of obstetrical risk level and care of pregnant women in suitable structures [2,3].

In France, a law allowing birth centre trials was passed in September 2013, followed by publication by the HAS (the French National Authority for Health) in September 2014 of the specifications governing their operation [4].

These specifications outline the criteria defining low-risk and high-risk pregnancies issued by the HAS in 2007 as part of the perinatal plan, in order to guide the monitoring of these pregnancies by the healthcare professionals by assessing the probability of an unfavourable event based on the risk factors identified [5]. The HAS defines a low-risk pregnancy as having a physiological development in a woman who is, and remains, in good health. In practice, it is defined as the absence of criteria defining the high-risk pregnancy. However, these criteria are not unanimously accepted, they are not used as standard practice across France and there is no international consensus of opinion regarding their use.

Although the high-risk pregnancy risk factors and their changing nature are known and reassessed throughout the pregnancy, can they be used to accurately predict the favourable

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outcome of childbirth? [6]. The correlation between the risk level assessed during the pregnancy and the risk level present in delivery room has never been really determined and several studies have demonstrated a significant number of complications occurring during childbirth in case of presumed low-risk pregnancy (despite different definitions) [7,8]. For example, postpartum haemorrhage sometimes occurs without an identifiable risk factor, and still accounted for 18% of maternal deaths in France between 2007 and 2009, many of which could have been avoided [9].

The main objective of this study was to assess the obstetrician intervention rate in a standard maternity unit in a group of supposedly low-risk pregnancies, by comparing it with a group of high-risk pregnancies. The secondary objectives were to assess the global obstetrician calling rate and compare the intervention and calling rates within the low-risk population according to the parity.

Methods

A descriptive retrospective study was conducted in a level 3 university hospital maternity unit between 1st and 30th January 2014. This maternity unit performs around 3100 deliveries per year with 21.3% Caesarean sections in 2014.

Based on an analysis of the literature together with the 2009 HAS recommendations, we defined the low-risk pregnancy according to numerous criteria (Supplementary data).

Patients meeting all the criteria were classified in the "low-risk" population, patients failing to meet 1 or more criteria were classified in the "high-risk" population. All the women who gave birth in our centre during the study period were included and divided into two groups, excluding medical terminations of pregnancy, stillbirths and Caesarean sections programmed before labour.

The data were collected retrospectively by studying computerised obstetrical records (Obstétrique 4D® software, used since 2003).

The following characteristics concerning the patients and the development of their pregnancies were studied in each group: the maternal age available when creating the record, the mother's ethnic origin, body mass index (BMI) between 30 kg/m^2 and 35 kg/m^2 before the pregnancy, tobacco consumption during the pregnancy (cigarettes per day), alcohol consumption during the pregnancy, gestational age at childbirth, parity, result of the vaginal swab to detect possible infection of streptococcus B carried out systematically in the 9th month of pregnancy, hospitalisation during the pregnancy, induction of labour or not.

The following criteria were used to assess the course of labour and childbirth:

- presence of a foetal heart rate abnormality during labour justifying calling the doctor (foetal heart rate at least intermediate according to the French College of Gynaecologists and Obstetricians (CNGOF) classification [10]);
- presence of metrorrhagia;
- coloured or meconium-stained amniotic fluid;
- occurrence of hyperthermia greater than or equal to 38 °C;
- prescription of antibiotic;
- use of oxytocin (Syntocinon®) for labour induction;
- administration of epidural analgesia;
- duration of membrane rupture greater than or equal to 24 hours before birth;
- scalp blood pH measurement;
- occurrence of a "serious" event during labour (umbilical cord prolapse, placental abruption or uterine rupture);
- obstructed labour during the 1st active phase defined by nonprogressive labour of more than two hours for dilatation $\geq$ 5 cm;
- obstructed labour during the second active phase defined by complete dilatation for more than two hours before the start of expulsive efforts;
- prolonged expulsive efforts for more than 30 minutes;
- instrumental vaginal delivery (realised in case of foetal heart rate abnormality during expulsion or prolonged expulsive efforts for more than 30 minutes);
- Caesarean section;
- artificial delivery/uterus examination;
- occurrence of postpartum haemorrhage (defined by blood losses $\geq$ 500 mL during the 24 hours following childbirth);
- perineal condition (performance of an episiotomy, third and/or fourth degree perineal tears).

The criteria for adverse neonatal outcomes were:

- neonatal resuscitation (mask ventilation and/or oxygenation and/or intubation);
- arterial pH measured at the umbilical cord at birth less than 7 or between 7 and 7.20;
- APGAR score less than or equal to 7 at one and five minutes after birth;
- foetal growth abnormalities (small for gestational age for a birth weight less than 2500 g, foetal macrosomia for a weight greater than or equal to 4000 g);
- respiratory distress at birth excluding any prematurity;
- gastric sample taken at birth;
- presence of a neonatal infection;
- transfer to neonatal resuscitation or intensive care unit;
- death of the infant at birth or within 7 days after birth.

After analysing the literature [11], we decided to calculate the obstetrician intervention rate based on the occurrence of the following events requiring an obstetrical act: instrumental vaginal delivery, Caesarean section during labour, postpartum haemorrhage, artificial delivery and/or uterus examination.

Lastly, the following criteria were used to define and calculate the obstetrician calling rate: foetal heart rate abnormality, scalp blood pH measurement, occurrence of a "serious" event during labour, obstructed labour during the 1st active phase, obstructed labour during the second active phase, prolonged expulsive efforts, instrumental vaginal delivery, Caesarean section during labour, postpartum haemorrhage, third and/or fourth degree perineal tear.

If the obstetrician had to intervene several times during labour and/or delivery, only one criterion was chosen to calculate the total intervention rate. The same applied if the obstetrician had been called several times for the same patient.

The data were analysed using BiostaTGV, available on the web at URL: http://marne.u707.jussieu.fr/biostatgv/. Qualitative variables are expressed as a percentage and quantitative variables as mean and standard deviation at the mean. Statistical analysis of the quantitative data was performed using the Student's t test after checking the application conditions. The percentages were compared using the Pearson's Chi^2 tests or the Fischer's exact test depending on the application conditions. Logistic regression model was used to evaluate the main objective (obstetrician intervention rate). We have included the parity criteria in this model. All assumptions were tested at alpha risk 0.05.

Results

Over the period studied, we included 227 patients (224 singleton pregnancies and 3 twin pregnancies), of which 90 were classified in the "low-risk" group (39.7%) and 137 in the "high-risk" group (60.4%).

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