Original Article

Rate of caesarean sections according to the Robson classification: Analysis in a French perinatal network – Interest and limitations of the French medico-administrative data (PMSI)

A.-S. Lafitte [a,*], P. Dolley [a], X. Le Coutour [b,c], G. Benoist [a,c], L. Prime [d], P. Thibon [d], M. Dreyfus [a,c]

[a] Gynaecology–Obstetrics Unit, CHU Caen, 14000 Caen, France
[b] Public health unit, University of Caen Lower-Normandy, Medical school, CHU Caen, 14000 Caen, France
[c] University of Caen Lower-Normandy, Medical school, 14000 Caen, France
[d] Perinatal network, CHU Caen, 14000 Caen, France

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ABSTRACT

Introduction. – The objective of our study was to determine, in accordance with WHO recommendations, the rates of Caesarean sections in a French perinatal network according to the Robson classification and determine the benefit of the medico-administrative data (PMSI) to collect this indicator. This study aimed to identify the main groups contributing to local variations in the rates of Caesarean sections.
Material and methods. – A descriptive multicentric study was conducted in 13 maternity units of a French perinatal network. The rates of Caesarean sections and the contribution of each group of the Robson classification were calculated for all Caesarean sections performed in 2014. The agreement of the classification of Caesarean sections according to Robson using medico-administrative data and data collected in the patient records was measured by the Kappa index. We also analysed a 6 groups simplified Robson classification only using data from PMSI, which do not inform about parity and onset of labour.
Results. – The rate of Caesarean sections was 19% (14.5–33.2) in 2014 (2924 out of 15413 deliveries). The most important contributors to the total rates were groups 1, 2 and 5, representing respectively 14.3%, 16.7% and 32.1% of the Caesarean sections. The rates were significantly different in level 1, 2b and 3 maternity units in groups 1 to 4, level 2a maternity units in group 5, and level 3 maternity units in groups 6 and 7. The agreement between the simplified Robson classification produced using the medical records and the medico-administrative data was excellent, with a Kappa index of 0.985 (0.980–0.990).
Conclusion. – To reduce the rates of Caesarean sections, audits should be conducted on groups 1, 2 and 5 and local protocols developed. Simply by collecting the parity data, the excellent metrological quality of the medico-administrative data would allow systematisation of the Robson classification for each hospital.

Introduction

The caesarean section has become the most frequent surgical procedure in the developed countries. In 1985, the World Health Organisation (WHO) empirically recommended a rate of caesarean sections of 10–15% [1]. In 2015, a review of the literature concluded that there was no reduction in maternal and/or perinatal morbi-mortality above 10% of caesarean sections and that maternal mortality increased below 5% [2]. Nevertheless, for several decades, the rate of caesarean sections has continued to increase. In the countries of the Organisation for Economic Cooperation and Development (OECD), the average rates of caesarean sections were estimated at 14% in 1990, 20% in 2000 and 26% in 2009 [3].

Furthermore, there is a significant variation in this rate internationally, which was greater than 15% (upper threshold of the rate recommended by the WHO) in 69 countries out 137 (50.4%) in 2008 [4]. In 2014, Iceland was the only country with a rate of caesarian sections below 15%, out of the 31 European

countries taking part in the Euro-Peristat project [5]. In France, the national perinatal surveys (NPSs) showed that the rate of caesarean sections had increased from 15.4% to 20.5% between 1995 and 2010 [6]; it varied depending on the levels of the maternity units but also between maternity units of the same level. The crude rates of caesarean sections in the general population are interesting but remain insufficient to assess the quality of the care. Given the maternal and perinatal morbi-mortality associated with this surgical procedure in the short, medium and long term, there is an urgent need to implement interventions aimed at stabilising or even reversing their trend. The populations concerned by potentially avoidable caesarean sections must therefore be targeted.

The Robson classification is the most interesting of the numerous methods proposed to analyse the rates of caesarean sections. In 2015, WHO proposed adopting the Robson classification as "a global standard for assessing, monitoring and comparing c-section rates within healthcare facilities over time and between healthcare facilities" [7]. The analysis of the rates of caesarean sections in 10 mutually exclusive groups having different risk levels is based on five obstetrical characteristics. These groups do not take into account the indication for the caesarean section. It is a simple, prospective, efficient, robust and reproducible tool. This classification has been applied to the data of the perinatal national survey conducted in France in 2010 to obtain the rates of caesarean sections by group nationally as well as according to the level of maternity unit [8].

The main objective of our study was to assess within each maternity unit of a Perinatal network the rates of caesarean sections obtained in 2014 according to the Robson classification. This study was conducted to identify the main groups contributing to local variations in the rate of caesarean sections in order to set up corrective measures. The secondary objective was to assess the quality of the medico-administrative data (PMSI) for routine collection of this indicator, to generalise its use in France.

Material and methods

A descriptive multicentric study was conducted in France.

Study population

The data was collected in all 13 maternity units of a French perinatal network comprising 5 level 1 maternity units, 6 level 2 maternity units and 2 level 3 maternity units. Eleven of these maternity units belonged to public hospitals, two were private.

All Caesarean sections performed in 2014, whether programmed or emergency, before or during labour, were included in the study.

Data collection

Deliveries by Caesarean section were first identified using the medico-administrative data of each maternity unit, by looking for the code of the International Classification of Diseases O82.0, 1, 2, 8, 9, O84.2 and O66.4, and the procedures of the French medical classification for clinical procedures (CCAM) JQGA002 to JQGA004. An anonymous list of the caesarean sections performed in each maternity unit was drawn up, with the date of delivery, maternal age and gestational age (GA). Foetal presentation (cephalic, breech, transverse), type of pregnancy (singleton or multiple pregnancy), previous caesarean sections and type of Caesarean section (programmed, emergency before labour, emergency during labour) were then collected from medico-administrative data (Programme de Médicalisation des Systèmes

d'Information, PMSI), allowing the establishment of a simplified Robson classification.

Complementary informations such as parity and onset of labour (spontaneous or induced labour) were then collected by a single interviewer within each maternity unit by direct consultation of the delivery logbooks, the hospitalisation reports and/or the patient records. The list of caesarean sections drawn up using the medico-administrative data was compared with the data from the delivery logbooks in order to identify any discrepancies.

Robson classification

Each caesarean section was classified according to the Robson classification, in which groups 1 to 4 correspond traditionally to women with low risk of caesarean section (women at term, single foetus in cephalic presentation, primiparous (groups 1–2) or multiparous (groups 3–4) women), and groups 5 to 10 correspond to women with high risk of caesarean section (scarred uterus, pregnancies with non-cephalic presentation, multiple pregnancy or preterm delivery).

Three classification methods were used:

- in 10 groups according to the initial Robson classification [9];
- in 12 groups according to the modified Robson classification [8] (Appendix 1), which distinguishes between labour inductions and Caesarean sections before labor, in primiparous (groups 2a and 2b) and multiparous (groups 4a and 4b) women;
- in 6 groups according to the simplified Robson classification which merges groups 1 to 4 (groups 1–4) and groups 6 and 7 (groups 6–7).

Data confidentiality and authorisations

The perinatal network was authorised to collect indicators from the medico-administrative data by the Commission Nationale de l'Information et des Libertés (the French data protection authority) (authorisation DE-2011-024). In each maternity unit, the approval of the head of department was requested and obtained. No nominative data was collected as part of the study.

Statistical analysis

For the entire population, then for each level of maternity unit and for each maternity unit, the following values were calculated:

- the rate of Caesarean sections in each group (number of women delivered by caesarean section divided by the number of women in the group);
- the relative contribution of the group to the total rate of caesarean sections (number of women delivered by caesarean section in the group divided by the total number of women delivered by caesarean section).

For each group and for each level of maternity unit, the ratio of the highest rate of caesarean sections to the lowest rate was calculated. The rates of Caesarean sections were compared using Pearson's Chi^2 tests or the Fisher's test depending on the numbers calculated. To study the metrological quality of the medico-administrative data, the binary data were evaluated by calculation of the sensitivity (Se) and the positive predictive value (PPV) and their 95% confidence intervals (CI95%), the data collected in each maternity unit being considered as the reference. The sensitivity corresponded to the probability for the items entered in the patient