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Vaginal delivery care, episiotomy performance and examination of severe perineal tears: cross-sectional study in 43 public hospitals

Abstract

Introduction: In recent years work has been done in the public health system in Catalonia in order to achieve consensus in promoting a model of normal childbirth care. This study aims to ascertain the proportion of singleton, full-term vaginal non-instrumental births attended in public hospitals for which an episiotomy was performed and the incidence of severe perineal tears.

Methodology: Descriptive cross-sectional study of all singleton births between 37 and 41 completed weeks of gestation attended in public hospitals (2013-2014). Births were grouped into two groups "deliveries with episiotomy" and "deliveries without episiotomy". Hospitals were grouped by level of complexity (I to III – according to the Catalonia health department classification). The relationship between qualitative variables was analysed using a chi-square test and the T-student test was used for quantitative variables; a *p* value equal to or lower than 0.005 was considered significant. Results: Data were collected from 53770 births. The total percentage of perineal tears was 35.7% and the total of severe tears was 0.8%. No significant differences in the mean proportion of severe perineal tears among different types of hospitals or between the two groups. The regression analysis shows that the birth weight of the newborn is the only variable that increases the risk of experiencing a severe perineal tear.

Conclusion: No significant difference was demonstrated in Catalonia in the incidence of severe perineal tears in singleton full-term vaginal non-instrumental births with and without episiotomies.

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Introduction

In recent years, work has been carried out in the public health system in Catalonia (autonomous community of north east of Spain) to improve the quality of care in normal birth. The shift in the assistance model towards a less interventionist approach is based on a refocusing of maternity services that was initiated in 2007[1] and which, in line with the Strategy for Assistance at Normal Childbirth (SANC), facilitated the progressive implementation of a more women-focused assistance model predicated upon the minimal necessary intervention.

This approach became the project for normal birth assistance, gradually introduced into healthcare practice across the region of Catalonia. This work developed via three specific courses of action aimed at improving the infrastructure in maternity wards in hospitals, raising professionals' awareness and promoting women's participation in maternity care. All of these actions are coordinated by the Catalan Ministry of Health in order to involve all stakeholders and achieve greater consensus in promoting a model of normal childbirth care that is based on known recorded services the profile of the professional best practice.

In 2013, a maternity care assessment was performed to explore obstetric interventions conducted on singleton, full-term deliveries in all hospitals in 2014 in Catalonia.[2] In our environment care provided at birth in women with normal pregnancy is assumed mostly by midwives, but the exact proportion of births attended by midwives is not known. The assessment revealed, among other things, a downward trend in the performance of episiotomies in public hospitals and, further, no significant increase in the incidence of severe perineal tears.[3] Based on this evaluation, new lines of research were undertaken to respond to aspects of maternal and child health requiring improvement but for which the information needed for planning effective services currently does not exist. It has been shown that midwife-led care during low/medium risk pregnancy, labour, delivery and postpartum is associated with benefits for mothers and newborns, with no adverse effects in comparison with models of care offered by obstetricians or when both midwives and doctors[4,5] share the work. In addition, a reduction in the use of epidural analgesia, fewer episiotomies and instrumental deliveries have been observed during midwife-led care in some settings.[6,7]

One of the informational needs identified in the assessment performed in 2014 was the proportion and the outcomes of normal

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births attended to in public hospitals by midwives, and to deepen the results of the episiotomy performance. With the aim to obtain all this new information the study MidconBirth(MCB) was initiated.[8]

This work explores existing data in hospital discharge records with the aim to identify the performance of episiotomy of low and medium risk births in a specific period of time. It is important to know for the understanding of this study that all hospitals do attend low and medium risk births regardless its level of complexity. Women at low or medium risk are then treated under the same guidelines in all hospitals, so results may be compared between hospitals grouped by levels of complexity.

The procedure of episiotomy– an intervention that can be performed by midwives during vaginal non-instrumental delivery – was chosen for this analysis as a sensitive indicator, together with the occurrence of severe perineal tear, which could be related to the performance or non-performance of this intervention. The findings presented show the overall rate of episiotomies and perineal tears recorded in all public hospitals in the region of Catalonia, without differentiating the type of professional attending each childbirth. This baseline information will be useful in comparing the results obtained in the subsequent study (MCB), which will collect data on these same indicators, disaggregated in relation to births attended by midwives and/or other health professionals.

Ethical approval

This study was exempt from the ministry of health of the government of Catalonia ethics committee approval as is used publicly available anonymized data.

Methodology

The descriptive cross-sectional study of births recorded in the Minimum Basic Data Set (MBDS) in Catalonia), during 2013-2014 was used. The register is mandatory for all 43 public hospitals and provides the basis for government reimbursement through the Catalan Health Service. The International Classification of Diseases (ICD-9-CM) is used for coding in the MBDS.

Data on all singleton births between 37 and 41 completed weeks of gestation attended in public hospitals were retrieved (Figure 1). Subsequently, cases without associated codes indicating an instrumental delivery or caesarean section were selected. Once cases were compiled, they were grouped into two categories "deliveries with episiotomy" and "deliveries without episiotomy" as well as according to codes representing the type of perineal tear registered: 1st-degree tear, 2nd degree tear, severe perineal tear (groups 3 and 4) and "other tears" (where tears were reported but with no specified degree). In addition, information on maternal age at delivery and newborn birth weight was collected for each case.

Due to the small number of cases of severe perineal injury recorded in a single year, for the analysis, accumulated cases from 2013 and 2014 were obtained.

A descriptive analysis was prepared for each hospital group to obtain the mean and the confidence interval (95%) for each variable. Hospitals were grouped by level of complexity (I to III), with Level I having the lowest capacity and Level III the greatest capacity and technical resources for complex care. Figure 2 (levels of complexity). The relationship between qualitative variables was analysed using a chi-square test and the T-student test was used for quantitative variables; a *p* value equal to or lower than 0.005 was considered significant. Finally, a logistic regression model was used to analyse the relationship between maternal age, birth weight and performance of an episiotomy and severe perineal tear. . The PASSW 21 statistical package was used for the analysis.

Results

Data were collected from 53770 births (26697 from 2013 and 27073 from 2014) Figure 1. Combined cases from 2013 and 2014 were used for the bivariate analysis and logistic regression cases. There were a total of 53770 SFTVNIB births, of which 77.10% had no episiotomy and 22.90% had an episiotomy. The percentage of severe perineal tears recorded in all births was 0.80% (0.7 to 0.85%). The average birth weight at birth was 3330.1 g, (SD 434.8, range 1000.0-5620.0). The average maternal age was 30.7 years (SD 5.6) (minimum maternal age at birth was 12 years – and the maximum maternal age was 51 years). The classification of hospitals is shown in Table 1; 32.9% of births were attended in level I hospitals; 31.7% in level II and 35.3% in level III hospitals.

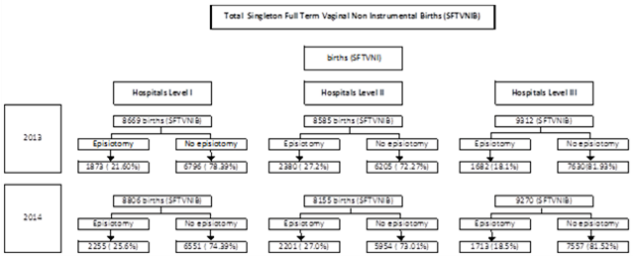

Figure 1 Flow-Chart.

Figure 2 shows the perineal tears recorded in all singleton full-term vaginal non-instrumental births (SFTVNIB) attended in Catalonia throughout 2013-2014. Births are classified into two groups "deliveries without episiotomy" and "deliveries with episiotomy" and in each group the mean proportion of the overall number of tears recorded in Catalonia are shown.

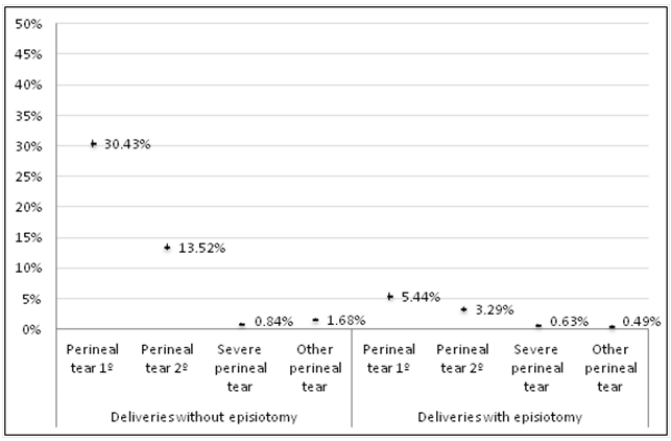

Figure 2 Perineal tears in Singleton Full Term Vaginal Non Instrumental Births (SFTVNIB).

To explore the possible differences between types of hospital, tears registered in the two groups of births were explored in relation to the type of hospital in which they occurred and were treated. Table 1 shows the mean ratio and confidence interval (95%) of each type of tear in each group of hospitals and for each group (births with episiotomy and births without episiotomy). Figures obtained show no significant differences in the mean proportion of severe perineal tears among

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different types of hospitals or between the two groups. However, a relevant difference is seen for 1st and 2nd degree tears between the two groups of births in all groups of hospitals. The highest mean proportion of 1st degree perineal tears is recorded in births without an episiotomy and attended in level I hospitals.

Table 1 Hospitals classification

Hospital complexity level	Number of hospitals	Hospital capacity for complexity care
Level I	23	Low and medium risk term births, premature births [35-36 weeks gestation]. In case of complications stabilisation and transfer
Level IIA	6	High risk deliveries not requiring other medical specialties, premature births (> 32 weeks gestation or >1.5 Kgrs). Neonates with non severe pathology, mechanical ventilation for short periodes and post NICU care. Providing support to Level I hospitals
Level IIB	5	Very high risk births. Intermediate obstetric risk units including shorttime mechanical ventilation. Premature births (>28 weeks gestation or 1.0 Kgrs). Congenital anomalies nonrequiring specialist. Minorsurgical problems. Providing support to Level I, IIA
Level IIIA	6	Pregnancies and deliveries requiring ongoing coordination with other medical specialties. Extreme prematures (<28 weeks of gestation or < 1.0 Kgrs), Providing support to Level I, IIA and IIB
Level IIIB	2	Deliveries requiring the highest level of medical and surgical complexity. Permanent coordination with sub-specialties (fetaal heart surery, transplantation, etc.). Providnig support to Level I, IIA, IIB and IIIA

Level of Neonatal Care I: Health Newborn>35-36 weeks of Pregnancy;
Level of Neonatal Care IIA: newborn>32 weeks of Pregnancy and/or >1000g;
Level of Neonatal Care IIB: newborn>28 weeks of Pregnancy and/or >1000g;
Level of Neonatal Care IIIA: newborn< 28 weeks of Pregnancy and/or 1000g;
Level of Neonatal Care IIIB: Cardiac Surgery Neonates, Neurosurgery

The bivariate analysis shows that episiotomies were performed more frequently on younger women (mean age 29.99 years, SD 5.76); this difference was significant (p = 0.000) compared to the mean age (30.99 years SD 5.52) of women who did not have an episiotomy. No significant difference (p = 0.977) was found in the age of women with severe perineal tears.

With regard to infant weight at birth, the bivariate analysis revealed a significant difference in the weight of newborns between births in which an episiotomy was performed (greater mean weight), and those in which an episiotomy was not performed (p = 0.009), although it was deemed that the weight difference identified (11 g) had no clinical relevance. However, a significant clinically relevant difference was found in the weight of newborns in which a severe tear occurred (average weight 3489.29 g SD 441.72) and birth weight of newborns whose mothers did not have a severe perineal tear (mean weight 3330.24 g, SD 434.53 g). Finally, the difference between severe perineal tears among births with or without an episiotomy was not found to be significant (p = 0.459)

For the regression analysis, a severe perineal tear was considered a variable of the result and maternal age, birth weight and episiotomy as explanatory variables. The analysis shows that the birth weight of the newborn is the only variable that increases the risk of experiencing a severe perineal tear (Table 2 & 3).

Table 2 Perineal tears (SFTVNIB) according to type of hospital

			%	CI
No Episiotomy	H. Level I	Perineal Tear 1°	33.07	32.3-33.9
		Perineal Tear 2°	12.83	12.30-13.40
		Severe Perineal Tear	0.65	0.50-0.80
		Other Perineal Tear	1.18	1.00-1.40
	H. Level II	Perineal Tear 1°	27.76	27.00-28.60
		Perineal Tear 2°	13.46	12.90-14.10
		Severe perineal Tear	0.70	0.60-0.80
		Other perineal Tear	1.13	0.90-1.30
	H. Level III	Perineal Tear 1°	25.23	24.50-25.90
		Perineal Tear 2°	12.10	11.60-12.30
		Severe Perineal Tear	0.98	0.80-1.10
		Other Perineal Tear	1.72	1.50-1.90
Episiotomy	H. Level I	Perineal Tear 1°	6.64	5.90-7.40
		Perineal Tear 2°	2.80	2.30-3.30
		Severe Perineal Tear	0.75	0.50-1.00
		Other Perineal Tear	0.36	0.20-0.50
	H. Level II	Perineal Tear 1°	2.47	2.00-2.90
		Perineal Tear 2°	2.1	1.70-2.50
		Severe Perineal Tear	0.61	0.40-0.80
		Other Perineal Tear	0.22	0.10-0.40
	H. Level III	Perineal Tear 1°	7.48	6.60-8.40
		Perineal Tear 2°	4.30	3.60-5.00
		Severe Perineal Tear	0.8	0.50-1.10
		Other Perineal Tear	1.15	0.80-1.50

Table 3 Regression analysis. Perineal tears and risk factors

Maternal Age			Newborn Weigh at Birth			Episiotomy		
OR	CI (95%)	*p value*	OR	CI (95%)	*p value*	OR	CI (95%)	*p value*
0.997	0.980-1.015	0.752	1,001	1.001-1.001	0.000	1,083	0.857-1.370	0.503

Discussion

The current study was conducted using data available in the MBDS from which a sample of perineal tears in singleton full-term vaginal non-instrumental births was selected. The analysis of 53770 births included for the years 2013 and 2014 revealed that the proportion of episiotomies performed was 22.9%, showing a reduction in relation to the analysis performed using the same methodology in 2007, which found a 29.2% ratio of episiotomies in singleton full-term vaginal non-instrumental births.[2] Data collected demonstrate that, in Catalonia, the systematic practice of performing episiotomies in this particular type of births has decreased and is now carried out more restrictively, as prescribed by practice-based evidence.[9]

Completeness and accuracy of the records of episiotomies and perineal tears was verified via a comparison of existing data in hospitals and data recorded in the MBDS by means of physical visits to 30 public hospitals throughout 2012-2013.[10] This finding, together with the standardization of the records and examination of the diagnoses and related procedures recorded in each case, represent one of the strengths of this study. By examining data that have been recorded in a standardized manner for several years as part of the same registration system, we have biases already described by other authors

who attribute the increase in severe tears recorded in recent years to improved registration and standardized classification.[11-15] The use of separately coded data also helped strengthen the study's findings.

Our study presents the proportions of each type of perineal tear recorded in 2014, in both births in which an episiotomy was performed as well as in those without an episiotomy. The overall results of this study coincide with other studies[16-18] that demonstrate a higher proportion of 1st and 2nd degree tears in births without an episiotomy, while it also confirms that the proportion of severe perineal tears remain lower than 1% of births in which an episiotomy was performed as well as in those without an episiotomy. The proportion of severe perineal tears found in Catalonia is lower than that found in the majority of studies conducted[19-21] probably because, in this study, instrumental deliveries were excluded, as they usually exhibit a higher incidence of perineal tears. The presentation of data for each group of hospitals according to their level of complexity makes it possible to observe that the proportion of severe perineal tears of less than 1% remained constant for the three groups of hospitals. Level I hospitals with low and medium risk term births, midwives being in charge of the care of the woman and childbirth and in case of complication stabilisations and transfer to a higher level hospital is required. Level II, hospitals with high risk deliveries not requiring other specialities, premature births up to 28 weeks gestation , and level III hospitals, pregnancies and deliveries requiring ongoing coordination with other medical specialities, and deliveries requiring the highest level of medical and surgical complexity and extreme prematures (less than 25 weeks gestation or less than 1kg.)

Our study was conducted in public hospital settings in a region in which a care model based on normal delivery with minimal intervention is being implemented. The non-routine practice of episiotomies, among other recommendations, has been promoted within this care framework. Our assessment confirms, as found in other studies, that 1st degree tears, considered benign lesions that do not require repair, are the most frequent occurrence in births where an episiotomy has not been performed[22-24] and that 2nd degree tears are also more frequent among births without episiotomies, but the restrictive use of an episiotomy has prevented a greater proportion of women having had a surgical incision as opposed to a minor tear.[25] Finally, the study revealed how the restrictive use of episiotomies reduces their percentage without compromising the safety of women or newborns.[26,27]

Various studies have revealed several risk factors for severe perineal tears. The most frequently reported risks are parity, maternal age, birth weight of the newborn and the use of instruments, but also maternal position during labour, use of epidural analgesia, induction of labour, stimulation with oxytocin and sex of the child.[18,28-30] Other, earlier studies served to rule out risk factors related to the occurrence of perineal tear, such as hands-off, use of a bathtub or even maternal position during labour[30,31] or identified protective factors against severe lacerations such as lateral position.[32]

This study was conducted as part of the assessment of the Normal Birth Care Programme by the Ministry of Health of the Government of Catalonia, which recommends not performing episiotomies as a matter of routine, as routine episiotomy was the practice before introducing the programme. After six years of implementing the Programme, the results from this study confirm that the practice of episiotomies can be reduced without causing injury[33] and that factors related to the type of delivery care that can increase the likelihood of perineal tears should continue to be explored.

Contribution of the study

The work that we present in this paper, analyses the situation with the current available information in the MBDS, prior to the start of a new study (MCB). Results coming from this work are important for further comparisons with upcoming studies if it is demonstrated, in future works that there are other different variables, that may contribute with new information to explain perineal tear rates and to permit a broader understanding of birth outcomes.

Limitations

This study was not able to analyse parity because this indicator was not available in the database.

Conclusion

No significant difference was demonstrated in Catalonia in the incidence of perineal tears in singleton full-term vaginal non-instrumental births with and without episiotomies. Non-performance of an episiotomy in these births did not increase the likelihood of experiencing a serious tear.

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Conflicts of interest

None.

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