



## ENFERMERÍA Y PERSPECTIVA DE GÉNERO

### Factors affecting the performance of a selective episiotomy in nulliparous women

Factores que influyen en la realización de una episiotomía selectiva en mujeres nulíparas

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Palabras clave: Episiotomía selectiva; episiotomía rutinaria; desgarró perineal; episiotomía restrictiva.

### ABSTRACT

**Objective:** To determinate factors affecting the performance of a selective episiotomy in nulliparous women.

**Methods:** A descriptive cross-sectional study was conducted at the Miguel Servet University Hospital (HUMS) of Zaragoza within a sample of 568 nulliparous women. The performance of episiotomy was compared to postpartum variables such as: maternal age, nationality, gestational age, fetal weight, time of birth, fetal sex, analgesia used and professional attending the birth, as well as the existence of tears and pH results fetal umbilical cord artery.

**Results:** The rate of episiotomy in nulliparous women at HUMS of Zaragoza is 62%. Factors influencing the performance of an episiotomy are greater fetal weight ( $p=0,000$ ), as well as individual professional judgment attending childbirth.

Other factors such as gestational age, fetal sex, epidural analgesia, time of birth or nationality do not affect the above mentioned performance.

Lack of episiotomy increases first degree perineal tears and, to a lesser extent, the second degree, without causing an increased risk for fetal wellbeing. In addition, it allows the possibility of maintaining the full perineum after birth, mainly among younger women.

**Conclusions:** It would be advisable to revise the protocols of selective policy for episiotomy rate decrease and equalize rates between different professionals.

## RESUMEN

**Objetivo:** Determinar los factores que influyen en la realización de una episiotomía selectiva en mujeres nulíparas.

**Material y método:** Se realizó un estudio descriptivo transversal en el Hospital Universitario Miguel Servet (HUMS) de Zaragoza con una muestra de 568 mujeres nulíparas. Se comparó la existencia o no de episiotomía tras el parto con las variables: edad materna, nacionalidad, edad gestacional, peso fetal, hora de nacimiento, sexo fetal, analgesia empleada y profesional que asiste el parto, así como la existencia de desgarros y los resultados del pH de la arteria umbilical fetal.

**Resultados:** La tasa de episiotomía en las mujeres nulíparas en el HUMS de Zaragoza es de un 62%. Entre los factores que influyen en la realización de una episiotomía se encuentran el mayor peso del feto ( $p=0,000$ ), así como el criterio individual del profesional que asiste el parto. Otros factores como la edad gestacional, el sexo fetal, la analgesia epidural, la hora de nacimiento o la nacionalidad no influyen en su realización. El no hacer episiotomía incrementa los desgarros perineales de primer grado, y en menor medida los de segundo, sin que ocasione un mayor riesgo para el bienestar fetal. Además, su no realización permite la posibilidad de mantener el periné íntegro tras el parto, principalmente entre las mujeres más jóvenes.

**Conclusión:** Sería recomendable revisar los protocolos de política selectiva de episiotomía para conseguir disminuir su tasa e igualar los porcentajes existentes entre los diferentes profesionales

## INTRODUCTION

The episiotomy is an incision made in the perineum to enlarge the vaginal opening <sup>(1)</sup>. It was clinically introduced in the 18<sup>th</sup> Century <sup>(1,2)</sup>, but it was not routinely employed until the first half of the 20<sup>th</sup>. The cause of its use was based on the reduction of the risk of perineal tears, pelvic floor dysfunction, and urinary and faecal incontinence <sup>(2)</sup>. Despite the limited data about its use, it became a regular proceeding, underestimating the potential adverse effects <sup>(2)</sup>.

Recent research advice the use of the selective episiotomy against the routine because its restrictive use presents a lower rate of maternal morbidity derived from a minor perineal trauma. Its restrictive use causes a minor risk of subsequent perineal trauma, a minor need of suture of its perineal trauma and less complications related to the cicatrization within seven days <sup>(1,6)</sup>. However, the restrictive policy causes an increase of first and second grade tears <sup>(7)</sup>, mainly located in the anterior perineum <sup>(1,8)</sup>, but not an increase on those of third and fourth grade <sup>(6,8,9)</sup>.

About the fetal morbidity, no association has been found between the use of selective episiotomy and the bad perinatal results <sup>(5,7)</sup>, such as the 5-minutes apgar of less than 7 <sup>(10-12)</sup>.

The Strategy for Childbirth proposed by the Spanish Ministry of Health and Consumption (Estrategia de Atención al Parto Normal del Ministerio de Sanidad y

Consumo), recommends to avoid the routine episiotomy in spontaneous vaginal delivery <sup>(13)</sup>, limiting its use to instrumental delivery (except those in need of vacuum assistance) and in cases of confirmed fetal distress. The objective of this recommendation is to achieve episiotomy rates lower than 10% <sup>(14)</sup>. In spite of the wide evidence about the benefits of the selective episiotomy, it is still being employed in a high percentage of deliveries and without following a common criterion <sup>(13)</sup>. For instance, in Colombian hospitals, the episiotomy rate varies from 51-61% among nulliparous women<sup>(8)</sup>. In Brazil, the rate is 29.1%<sup>(10)</sup>, while it reaches 63.3% in South Africa and 100% in Guatemala <sup>(15)</sup>. In Spain the percentage varies from 33% to 73%, depending on the Autonomous Community<sup>(13)</sup>. According to a research published in 2006, the episiotomy rate is 50.48% <sup>(16)</sup>. However, this rate seems to be falling in our country, with a reduction of 20% between 2001 and 2006 <sup>(3)</sup>. This fact coincides with other European countries, such as France, where, after implementing the restrictive episiotomy policies, the rate has fallen from 55.7% to 13.3%<sup>(17)</sup>. According to a research published in 2005 <sup>(9)</sup>, after the implementation of the restrictive policies at the Miguel Servet Hospital (Zaragoza, Spain), the episiotomy rates varied from 83.7% to 59%.

Among the variables related to the realization of episiotomy, we can find the age, the nulliparity and the maternal pathology (hypertensive syndrome and gestational diabetes) <sup>(10)</sup>. About the age, the performance of episiotomy is more common among the teenagers, while it decreases from 35 year-old-women <sup>(10)</sup>. The maternal pathology <sup>(10)</sup> and the nulliparity <sup>(7,10,11,15)</sup> are associated to an increase on the prevalence of the episiotomy.

Other variables such as the gestational age or the newborn's weight did not present any relation to the performance or non performance of the episiotomy <sup>(7,10,11)</sup>.

Other factors, such as the fetal gender, the type of anaesthesia, the nationality or the professional attending the delivery, have been studied in a lower extent. Therefore, the authors believe this research to be necessary, because it would provide more information to consolidate the use of the selective episiotomy among the health professionals.

## **OBJECTIVES**

- Analyze whether any association among the variables exists: maternal age and nationality, gestational age, gender and fetal weight, time of birth, professional attending the delivery, type of anaesthesia used with or without episiotomy.
- Determine whether the realization of the episiotomy influences the fetal pH, the appearance of perineal tears and its grade.

## **MATERIALS AND METHODOLOGY**

### **Design**

Cross sectional study about the episiotomy performance employed at the HUMS through the revision of the registry book kept in the delivery room.

### **Scope**

Childbirth Unit of HUMS; level III hospital whose maternity unit assists areas 2 and 5 of the healthcare map in the Autonomous Community of Aragón (Spain).

### **Period of study**

From September 2012 to February 2013, both included.

### **Population Sample**

Every nulliparous woman who had a full-term pregnancy, unique alive fetus with cephalic presentation, whose delivery was either spontaneous or induced, attended at the HUMS within the above specified period was included in the research.

Therefore, primiparae or multiparae were excluded. Out-of-hospital deliveries, toco-surgical proceedings (through forceps, vacuum, or caesarean births), multiple pregnancies, preterm babies or dead fetus were excluded. Those cases where the gestational age was unknown at the moment of delivery and those where the woman had had genital mutilation were also excluded.

### **Sample size determination**

Study criteria for inclusion were fulfilled by a total of 568 women. The authors decided not to practice any sampling because it was considered imperative to analyze the information of every individual.

### **Data collection**

A template was employed to collect socio-demographic, obstetric, and newborn data. These data were obtained from the registry book kept at the delivery room of the HUMS, referring to above mentioned period – September 2012 to February 2013.

### **Research variables**

Main dependent variable:

Episiotomy performance: YES/NO.

Secondary dependent variables:

pH of the umbilical artery. The pH of the umbilical artery was measured after the birth. The values were classified as follows <sup>(18)</sup>

> 7.10 (normal value)

7.0 – 7.09 (acidosis)

< 7.00 (pathological fetal acidosis)

Perineal tear. Were classified into: no tear/ 1<sup>st</sup> grade / 2<sup>nd</sup> grade / 3<sup>rd</sup> grade / 4<sup>th</sup> grade.

Independent variables:

Maternal age. Was collected quantitatively, expressed in years. Besides, it was grouped qualitatively, as follows: <15 years/ 15-19 / 20-24 / 25-29 / 30-34 / 35-39 / 40- 44 / >45 years.

Gestational age. Was collected quantitatively, expressed in years. It was collected also qualitatively, grouping as follows: 37-37,6 / 38-38,6 / 39-39,6 / 40-40,6 / 41-41,6, >42.

Maternal nationality. In order to achieve a larger sample, the nationalities were grouped as follows: West Europe / East Europe / South America / North America / Asia / Australia / Africa Sub-Sahara / Africa Maghreb.

Time of birth. Expressed in hours and minutes.

Fetal gender: Male / Female.

Fetal weight. The newborn weight was collected during the first hour of life, expressed in grams. As qualitative variable, was grouped as follows: <1500 / 1500-1999 / 2000-2499 / 2500-2999 / 3000-3499 / 3500-3999 / 4000-4499 / >4500 grams.

Type of anaesthesia: None / epidural / intradural / combined / local.

Category of the professional attending the delivery: Gynaecologist / Midwife / Midwife resident / Resident of gynaecology.

Category of the professional attending the delivery: Each professional was registered by a different number.

### **Data analysis**

Data collected using the software Microsoft Office Excel 2007<sup>®</sup> were imported to a matrix with the format of the software Statistical Package for the Social Sciences<sup>®</sup> (SPSS), on its 15.0 version.

In the non-variable analysis - qualitative variables - the numerical analysis was performed by frequency tables, while the graphic analysis which complements it was elaborated using either pie charts or bar charts. About the quantitative variables - the numerical analysis - different measures of summary were employed and frequency tables in those cases where the variable had few different values. The graphic analysis was performed by means of histograms or box charts. In the bivariate analysis, if both variables were qualitative, the corresponding contingency table was elaborated, together with the  $\chi^2$  (Chi-squared) test, complementing the information with grouped bar charts. When one of the variables was quantitative and the other qualitative, the averages were compared by means of box charts or error bars.

### **Ethical considerations**

The Unidad de Calidad Asistencial (Asistencial Quality Unit) of the HUMS, the Direcciones de Enfermería y Médica (Nursery and Medical Directions) of the hospital and the Ethics Committee of the Centre (Comité de Ética del Centro), were informed about the conduction of this research and consent it. No ethical conflict was identified.

### **RESULTS**

During the study period, 2035 deliveries were registered at the HUMS. From them, 1075 corresponded to nulliparous women (52.83%), and 568 women (27.91%) fulfilled the criteria for inclusion within the research.

The average age of the sample was 30.6 years. The most frequent nationality was Spanish (76.4%).

Episiotomy was performed on 62% of women included in the research. Concerning the assessment of the perineal tears after delivery, 68.8% of the cases did not present any tear. Within the different grades of tears, the first was the most common (32.2%).

Concerning the fetus, male sex was predominant (51.1%) over female. The average birth weight was 3237 grams, and the average gestational age, 40 weeks. As a neonatal result, the pH of the umbilical artery was determined, obtaining an average value of 7.26.

Concerning the professional attending the delivery, it should be highlighted that on 56.3% of the cases, it was the midwife who intervened, followed by the midwife residents (25.7%), residents of gynaecology (14.4%) and gynaecologists (3.5%).

Comparing different variables collected by the performance of episiotomy, the following results were obtained:

### ***Maternal Age / Performance of episiotomy***

An increase on the episiotomy percentages was observed as the maternal age increased, rising from 52.38% in the 15-19 years group to 77.27% from 40 years on. Nevertheless, comparing the maternal age in both groups (episiotomy or not) no significant relation was found between both variables ( $p = 0.208$ ).

**Table I.** Episiotomy among group age

#### ***Percentage by group age***

	<b>N (%)</b>	<b>Episiotomy</b>
<b>15 to 19 years</b>	21 (3.7%)	11 (52.38%)
<b>20 to 24 years</b>	69 (12.1%)	41 (59.42%)
<b>25 to 29 years</b>	118 (20.8%)	70 (59.32%)
<b>30 to 34 years</b>	218 (38.4%)	140 (64.22%)
<b>35 to 39 years</b>	120 (21.1%)	74 (61.67%)
<b>40 to 44 years</b>	22 (3.9%)	17 (77.27%)
<b>&gt; 45 years</b>	0 (0%)	0 (0%)

### ***Fetal weight / Performance of episiotomy***

Analyzing both variables it was confirmed that in those cases where the episiotomy was performed, the average fetal weight was 3284.7 grams; when it was not performed, the average was 3162.0 grams (a difference of 122.7 grams). This difference, even small, was statistically significant ( $p = 0.000$ ).

### ***Category of the professional attending the delivery / Performance of episiotomy***

Analyzing the percentages of episiotomy for each professional category, it was confirmed that the gynaecology residents had the highest rates (74.4%), followed by

the midwife residents (59.6%), and midwives (60.6%). Gynaecologist rate was 50%. When performing the Chi-squared test, a statistical value of 7.180 and a significance of 0.066 were obtained.

### **Professional episiotomy rate**

The individual episiotomy rate determined was over 91 professionals. Analyzing the results, there is no existence of uniformity between the individual rates of episiotomy.

**Table II.** Episiotomy rate over the professionals with the highest number of deliveries

N. of deliveries	1	6	12	12	5	1	7	3
Rate	100%	66.7%	75.0%	16.7%	40.0%	100%	100%	100%
N. of deliveries	21	12	2	5	13	6	1	1
Rate	85.7%	50.0%	100%	100%	46.2%	50.0%	0.0%	100%
N. of deliveries	3	6	21	5	5	9	3	10
Rate	100%	33.3%	71.4%	60.0%	20.0%	77.8%	33.3%	70.0%

### **Other variables / Performance of episiotomy**

No significant statistical relation was found among the variables: maternal nationality (Chi-squared=3.735 and  $p=0.588$ ), fetal gender (Chi-squared=0.548 and  $p=0.490$ ), gestational age ( $p=0.204$ ), time of birth (Chi-squared=11.746 and  $p=0.383$ ), and type of anaesthesia (Chi-squared=5.649 and  $p=0.130$ ) with the performance or non performance of episiotomy.

### **Performance of episiotomy and fetal pH result**

Performing the statistical analysis of both variables, a Chi-squared of 1.007 and a significance of 0.494 were obtained.

In both groups (episiotomy or not) the fetal pH results found were normal (pH larger or equal to 7.10). No pathological fetal acidosis was found in any case.

**Table III.** Relation between episiotomy and fetal umbilical artery pH

#### **Performance of episiotomy and fetal pH results.**

Freq. (%)	No	Yes
PH > o = 7.10	212 (99.07%)	337 (97.97%)
pH: 7,00-7,09	2 (0.93%)	7 (2.03%)
pH < 7.00	0 (0.0%)	0 (0.0%)
Total	214 (100.0%)	344 (100.0%)

### **Perineal tears / Performance of episiotomy**

In our research, it was observed that the percentage of perineal tears was lower within the episiotomy group (6.5%) than in the non-episiotomy group (71.3%), association which was found statistically significant (Chi-squared:261.721;  $p=0.000$ ).

Taking the tear grade into account, it was observed that:

- The episiotomy group presented lower percentages of first and second tears (3.4% and 2.8% respectively), compared to the no episiotomy group.

- There was a significant rise of the first grade tears (55.6%) against the second grade (15.7%) within the no episiotomy group.

- The rate of third grade perineal tears was 0.3% in those women who had episiotomy done, but it did not happen within the no episiotomy group. No fourth grade tears appeared in any group.

- The percentage of intact perineum's (no tears or episiotomy) was 28.7%. They were more frequent among the youngest women (15-19 years), with a rate of 50%, decreasing as the age increased.

**Table IV.** Percentage of intact perineum by group age

**Percentage of intact perineum  
by group age**

<b>Age group</b>	<b>No episiotomy</b>	<b>Intact perineum Freq. (%)</b>
<b>15 to 19 years</b>	10	5 (50%)
<b>20 to 24 years</b>	28	12 (42.86%)
<b>25 to 29 years</b>	48	15 (31.25%)
<b>30 to 34 years</b>	78	19 (24.36%)
<b>35 to 39 years</b>	46	11 (23.91%)
<b>40 to 44 years</b>	5	0 (0%)
<b>&gt; 45 years</b>	0	0 (0%)

## **DISCUSSION**

After the publication of a research showing a decrease of the episiotomy rates over 24.7%, a selective episiotomy policy was implanted at the HUMS in 2005. Therefore, an episiotomy rate of 59% in nulliparous women<sup>(9)</sup> was achieved. This particular data is similar to the one obtained in our research (62%), although is still higher than the recommended by The Strategy for Childbirth proposed by the Spanish Ministry of Health and Consumption (Estrategia de Atención al Parto Normal del Ministerio de Sanidad y Consumo)<sup>(14)</sup>.

This research claims the fetal weight to be the main factor influencing the performance of episiotomy. Actually, it is observed that the average weight of the babies delivered by mothers who had episiotomy done was 122.7g heavier than in mothers who had not (3284.7g vs. 3162g), being statistically significant the rise of fetal weight with the realization of episiotomy. These results coincide with those obtained by Juste-Pina A. et al.<sup>(9)</sup>, Okeke TC, et al.<sup>(19)</sup>, Gossett DR, et al.<sup>(20)</sup>, Wu LC, et al.<sup>(21)</sup> y Koskas M, et al.<sup>(22)</sup>, relating fetal weight and episiotomy increase. However, other studies, such as Molina-Reyes. C, et al.<sup>(7)</sup>, Carvalho CC, et al.<sup>(10)</sup>, Herrera B, et al.<sup>(11)</sup>. Figueira L, et al.<sup>(12)</sup>, y Trinh AT, et al.<sup>(23)</sup> did not found statistically significant relation between the newborn weight and the performance of episiotomy.

Individual criteria seem to be another factor influencing the performance of episiotomy. Episiotomy rates vary from 75% to 16.7% among different professionals, what



determines the non-existence of common criteria when performing the episiotomy. The said individual criteria was highlighted on Gossett DR, et al.<sup>(20)</sup> y Wu LC, et al.<sup>(24)</sup> research. However, in our study, every professional sample is quite low, so new research would be needed to confirm this conclusion.

No relation between the variables seems to exist when analyzing the professional category as factor influencing the realization of episiotomy. In spite of it, and based on episiotomy frequencies of each group, we could highlight a higher rate of episiotomy among the gynaecology residents (74.4%), compared to midwives (60.6%) and resident midwives (59.6%). This result coincides with the obtained by Robinson JN, et al.<sup>(25)</sup>, who obtained rates slightly higher among the resident midwives (33.3%) than among the midwives (21.4%). The episiotomy rate among the gynaecologists was 50%, much lower than in the rest of categories. However, the number of deliveries assisted by this group is also lower, so it would be necessary to enlarge the sample to confirm the statement.

Concerning the relation between age and episiotomy, no statistically significant association was found between both variables, coinciding with the result obtained by Azón-López E, et al.<sup>(26)</sup>. The consulted studies show different results, because some authors establish a relation between the increase of episiotomy rate and the age increase<sup>(7,21)</sup>, while others show higher rates among the youngest groups<sup>(10,20,27,28)</sup>, or women from 35 years old<sup>(10)</sup>.

Analyzing nationality as a possible underlying factor for episiotomy, no association was found between both variables in our study. However, the number of women in some population groups is quite low, so new research would be needed to confirm this conclusion. Other consulted studies, such as Azón-López E, et al.<sup>(26)</sup>, did not find any relation either, while others established a higher episiotomy rate among Indians<sup>(21)</sup>, as well as Hispanics against Afro-Americans<sup>(28)</sup>.

No statistically significant relation was found between the gestational age and the performance of episiotomy, result that coincides with the obtained by Herrera B, et al.<sup>(11)</sup>.

Other variables, such as the use of analgesia during the delivery, did not present any association with the performance of episiotomy, mainly epidural analgesia and local analgesia. When revising the existent studies, contradictory results were found, above all, related to the epidural analgesia use. Authors such as Robinson JN, et al.<sup>(25)</sup> and Molina-Reyes C, et al.<sup>(7)</sup>, found a relation between the use of analgesia and episiotomy, while others, such as Trinh AT, et al.<sup>(23)</sup>, did not.

Concerning the fetal gender and the time of birth, no association was found between the variables and the performance of episiotomy. No research analyzing these variables has been found.

Concerning the question whether the performance or non performance of episiotomy may influence the neonatal results, determined by the umbilical artery pH, it was observed that the results were normal in both groups, so it does not influence the fetal well-being parameters. This result coincides with other studies consulted<sup>(29,30)</sup>, even with those who value the Apgar test as a measure to determine fetal well-being<sup>(7,10-12,30,31)</sup>. Therefore, the justification of the use of episiotomy to reduce fetal and neonatal morbidity would not be supported.

Analyzing whether the performance or non performance of episiotomy influences perineal tears, our research determines that the no realization increases the percentage of first and second grade tears, mainly those of first grade. This data coincides with the biggest part of the revised studies <sup>(4, 7, 9,10,12,30-33)</sup>. Besides, in our research, the non performance of episiotomy increased the percentage of more serious tears (third and fourth grade), coinciding with other consulted studies <sup>(30-34)</sup>, although authors such as Zafran N, et al.<sup>(35)</sup>, associate an increase of 0.8% on anal sphincter tears to the realization of restrictive episiotomy on primiparous women. Considering the episiotomy itself a second grade injury, we may say that its non performance will cause a higher risk of perineal injury, maximum a tear of the same grade, while an extremely high probability of a lower tears exists. This fact should be highly considered within the youngest women group, when the probability of keeping the perineum intact after the birth is higher.

A weakness of our study is the variable "perineal tear grade", which may cause a bias in the classification, because its assessment is carried out by each professional delivering the birth, and interpreting differences among each individual may exist. It would be important for future research to control the said bias by a previous training programme to unify the classification criteria or trusting a unique observer to determine this variable.

## CONCLUSIONS

From the obtained results, it could be concluded that, in our study, the main factors that seem to influence the performance of episiotomy are the fetal weight and the individual criteria of each professional attending the delivery.

Other factors, such as the gestational age, fetus gender, and epidural analgesia, time of birth or nationality seem to have a scarce or even inexistent influence over the performance or non performance of the episiotomy.

In this particular study, it has been confirmed that the non performance of episiotomy increases first grade tears and, in a lower extent, the second grade ones, without endangering the fetal well-being. Besides, by avoiding the routine episiotomy, the possibilities of keeping the perineum intact after the delivery increase.

The episiotomy rate within the sample population reaches 62%, a higher percentage than the recommended by the Spanish Ministry of Health and Consumption (Ministerio de Sanidad y Consumo). Therefore, it would be advisable to revise the selective episiotomy policy at the hospital to reduce the said percentage and unify the criteria among the health professionals.

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