

Pattern of episiotomy use & its immediate complications among vaginal deliveries in 18 tertiary care hospitals in India

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Background & objectives: In developed countries, efforts have been made to restrict episiotomy practice. However, in developing countries the episiotomy rates continue to be high. This study was conducted to evaluate the pattern of episiotomy use and its immediate complications among women delivering at tertiary level public hospitals in India.

Methods: Prospective data of all women undergoing vaginal delivery including instrumental delivery were collected daily from the labour room registers of the 18 tertiary care hospitals on a structured proforma. Weekly data from all sites were sent to a central unit for compilation and analysis. Odds ratio was used to compare the proportion of genital trauma among women with and without episiotomy both in nulliparous and multiparous women.

Results: Among 1,20,243 vaginal deliveries, episiotomy was performed in 63.4 per cent (n=76,305) cases. Nulliparous women were 8.8 times more likely to undergo episiotomy than multiparous women. The various genital tract injuries reported were first degree perineal tear (n=4805, 3.9%), second degree perineal tear (n=1082, 0.9%), third and fourth degree perineal tear (n=186, 0.2%), anterior vaginal trauma requiring suturing (n=490, 0.4%), extension of episiotomy/vaginal laceration/excessive bleeding from episiotomy or tear (n=177, 0.15%), vulval/vaginal haematoma (n=70, 0.06%) and cervical tear (n=108, 0.08%). The combined rate of third and fourth degree perineal tears was observed to be significantly lower ($P<0.001$) among nullipara who received episiotomy (0.13%) compared to those who delivered without episiotomy (0.62%).

Interpretations & conclusions: Significantly lower rates of third or fourth degree perineal tear were seen among nulliparous women undergoing episiotomy. The risk and benefit of episiotomy and its complications need to be evaluated through randomized clinical trials in the Indian context.

Key words Mediolateral episiotomy - perineal tear - vaginal deliveries

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Episiotomy was introduced in the early 1920s, as a means to cut short second stage of labour and prevent to perineal tears (PT) by widening the perineum¹. Published literature from developed countries found no clear benefit of routine episiotomy² while it reportedly increased frequency as well as severity of perineal damage³. Developed countries like Australia, Canada and Sweden made efforts to use episiotomy only for selected indications⁴⁻⁶. However, in developing countries, the episiotomy rates continue to be high. A survey conducted among eleven developing countries including India across the Global Network for Women's and Children's Health Research sites (2003) reported over 90 per cent episiotomy rates among nullipara though overall rate was about 40 per cent⁷. There is lack of data from India on the pattern of episiotomy use and its immediate complications among facility births.

This study was conducted to evaluate the pattern of episiotomy use and its immediate complications among women delivering at tertiary level public hospitals in India.

Material & Methods

This observational study was carried out during January to December 2009 through the network of Human Reproduction Research Centers (HRRCs) of Indian Council of Medical Research (ICMR), New Delhi, located in the departments of Obstetrics and Gynaecology in 18 tertiary care hospitals in different parts of the country (Table I). The annual deliveries were more than 10,000 in seven hospitals, between 5000 to 10,000 in five and 1000 to 5000 in the remaining sites. The client population of these hospitals comprised mostly of lower and middle income groups.

Table I. Centre-wise distribution of episiotomy use according to parity

Centre name (No. of women undergoing vaginal delivery)	No. of nullipara	N (%) nullipara given episiotomy [†]	No. of multipara	N (%) multipara given episiotomy [‡]
Safdurjung, New Delhi (18120)	8865	7597 (85.7)	9255	1868 (20.2)
KGH, Chennai (5255)	2560	2340 (91.4)	2695	1700 (63.1)
Goa Medical College, Goa (11989)	8619	8542 (99.1)	3370	809 (24)
SSGH, Baroda (2960)	1249	1073 (85.9)	1711	256 (15)
IOG, Chennai (7716)	4140	3507 (84.7)	3576	1724 (48.2)
RSRM, Chennai (7528)	4189	3920 (93.5)	3339	1852 (55.5)
SAT, Thiruvananthapuram (6317)	3847	3519 (91.5)	2470	1909 (77.3)
KEM, Mumbai (5176)	2053	1880 (91.6)	3123	1465 (46.9)
KMCH, Chennai (3663)	1750	1484 (84.8)	1913	122 (26.6)
Guwahati Medical College, Guwahati (15445)	6884	4488 (65.2)	8561	1435 (16.7)
JNMC, Belagari (1691)	842	457 (54.2)	849	122 (14.4)
PGIMER, Chandigarh (3238)	1397	1177 (84.2)	1841	995 (54)
Queen Mary's Hospital, Lucknow (2533)	1085	703 (64.8)	1448	445 (30.7)
KEM, Pune (719)	367	335 (91.3)	352	292 (82.9)
SCB, Cuttack (5543)	3138	1720 (54.8)	2405	986 (41)
JIPMER, Puducherry (13271)	7328	6461 (88.2)	5943	3377 (56.8)
Madurai Medical College, Madurai (7875)	4517	4231 (93.7)	3358	2342 (69.7)
AIIMS, New Delhi (1204)	611	559 (91.5)	593	226 (38.1)
Total (120243)	63441	53993 (85.1)	56802	22312 (39.3)

[†]Coefficient of variation (CV1) for episiotomy rates in nullipara=0.16 (not significant)
[‡]Coefficient of variation (CV2) for episiotomy rates in multipara = 0.5 (not significant)

At the time of the study, all hospitals performed mediolateral episiotomy and none of the hospitals had a policy of selective episiotomy use. Prospective data of all women having vaginal delivery including instrumental delivery were abstracted daily from the labour room register by trained staff on a structured proforma. Weekly data from all sites were sent to a central unit for compilation and analysis. Data collected included parity, mode of delivery, immediate genital injuries such as anterior and posterior perineal trauma, cervical tear, extension of episiotomy, vulval and/or vaginal haematoma *etc.* Perineal tear (PT) was classified into four categories⁸: 1st degree- injury to perineal skin only; 2nd degree - injury to perineum involving perineal muscles but not involving the anal sphincter; 3rd degree - injury to perineum involving the anal sphincter complex; and 4th degree - injury to perineum involving the anal sphincter complex and anal epithelium. Immediate perineal complications following vaginal delivery such as anterior vaginal trauma requiring suturing (AVT), PTs including 1st, 2nd, 3rd and 4th degree, excessive bleeding from episiotomy or vaginal laceration, vaginal/vulval haematoma and extension of episiotomy/severe vaginal laceration were collectively termed as composite complications.

Data were entered in MS Excel and analyzed as simple proportions and percentages. Mathematical calculations were done using conventional statistical formulae. Descriptive and inferential principles were used to draw conclusions from the study. Fisher's exact test was used for categorical data. Correlation coefficient (r) was calculated to examine the relationship between episiotomy rates, instrumental delivery and complications. Odds ratio was used to compare the proportion of genital trauma among women with and without episiotomy both in nulliparous and multiparous women.

Results

A total of 1,77,252 births took place during the study period. Of these, 1,20,243 (67.8%) were vaginal deliveries and 57,009 (32.2%) were caesarean sections. Episiotomy was performed in 76,305 (63.4%, 95% CI=63.2 to 63.7%) of the vaginal deliveries. The mean episiotomy rates among nullipara and multipara were 85.1 and 39.3 per cent, respectively (Table I). The coefficient of variation (CV) in episiotomy rates in nulliparous and multiparous women were 0.16 and 0.5, respectively which was not significant (Table I). Overall, nulliparous women were 8.8 times (95% CI=

8.59 to 9.08) more likely to undergo episiotomy than multiparous women (Figure). Table II describes the mode of presentation and birth outcome of children born of the women delivering with and without episiotomy segregated by parity.

The overall rate of instrumental delivery was reported to be 6.3 per cent (Table III). The rate of composite complications was 5.7 per cent which included first degree PT (n=4805, 3.9%), second degree PT (n=1082, 0.9%), third and fourth degree PT (n=186, 0.2%), AVT (n=490, 0.4%), extension of episiotomy/vaginal laceration/excessive bleeding from episiotomy or tear (n=177, 0.15%) and vulval/vaginal haematoma (n=70, 0.06%). The rate of cervical tear was 0.08 per cent. The site-wise distribution of episiotomy use, instrumental vaginal delivery and composite complication rates among vaginal deliveries is provided in Table III. The correlation of overall episiotomy use and instrumental deliveries with perineal complications in participating sites was not significant.

Women were classified in two groups - nulliparous and multiparous to analyze the effect of episiotomy on perineal complications. The presence or absence of tearing (anterior vaginal or perineal) and other complications in both nulliparous and multiparous women is summarized in Table IV. The combined rate of third and fourth degree perineal tears was observed to be significantly lower ($P < 0.001$) among nullipara who received episiotomy (0.13%) compared to those who delivered without episiotomy (0.62%). Significantly lower rates of vulval/vaginal haematoma (OR=0.4575, 95% CI=0.28 to 0.73, $P = 0.001$) and other

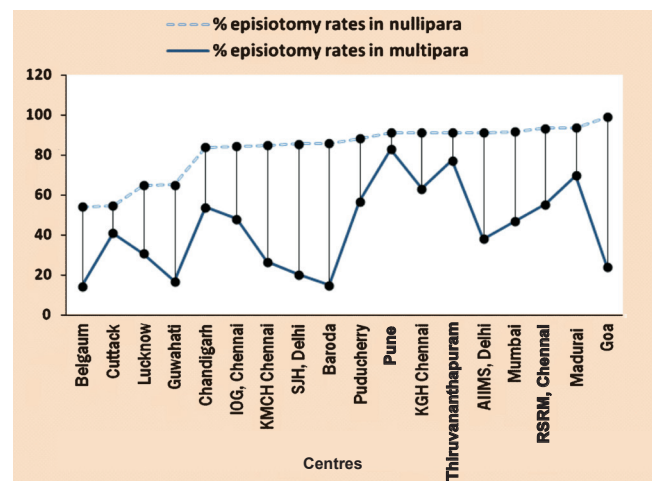


Figure. Distribution of episiotomy rates in multipara with ascending rates of episiotomy in nullipara.

Table II. Distribution of pregnancy outcome according to parity and episiotomy

	Nullipara		Multipara	
	With episiotomy N (%)	Without episiotomy N (%)	With episiotomy N (%)	Without episiotomy N (%)
Total children born [†]	54641	9609	22733	34851
Cephalic presentation	53559 (98.0)	9308 (96.8)	21869 (96.2)	34224 (98.2)
Breech presentation	1082 (2.0)	304 (3.2)	864 (3.8)	627 (3.8)
Live births	53224 (97.4)	8117 (84.5)	22193 (97.6)	32675 (93.8)
Fresh stillbirths	917 (1.7)	893 (9.3)	318 (1.4)	1390 (4.0)
Macerated still births	500 (0.9)	599 (6.2)	222 (1.0)	786 (2.2)
Birth weight <2500 g	17619 (32.2)	4462 (46.4)	6264 (27.5)	11228 (32.2)
Birth rate between 2500-3999 g	36588 (67.0)	4852 (50.5)	16156 (71.1)	22179 (63.7)
Birth weight ≥ 4000 g	434 (0.8)	295 (3.1)	313 (1.4)	1444 (4.1)
Infants with APGAR score ≤ 7 at 5 min	2601 (4.7)	623 (6.5)	1254 (5.5)	1459 (4.2)

[†]Total children born are more than the number of women due to multiple pregnancies

complications like extension of episiotomy or vaginal lacerations, excessive bleeding from episiotomy or tear (OR=0.6978, 95% CI=0.51 to 0.93, $P=0.017$) were noted in all those women given episiotomy.

Discussion

Episiotomy is one of the most commonly employed procedures for women delivering in tertiary level public hospitals in India with an overall episiotomy rate of about 70 per cent⁹. The episiotomy rate among nullipara (85%) in our study was similar to that reported in a population based cross-sectional study from Chennai (83.4%)¹⁰.

We compared our results with published literature reporting mediolateral episiotomy and found conflicting evidence on the role of episiotomy in preventing perineal tears. The policy of restrictive episiotomy use at John Radcliffe Hospital in Oxford during 1980-1984 resulted in a decrease in the episiotomy rate from 73 to 45 per cent but an increase in second degree perineal tears from 7 to 20 per cent. However, third degree perineal tear rate remained unchanged at 5 per cent¹¹. Sleep *et al*¹² randomized 1000 women during spontaneous vaginal delivery to either restricted or liberal approach without an overall increase in severe perineal trauma and there were both more posterior tears and more intact perineums in the restricted group. In another study, perineal suturing rates were compared among nullipara and multipara who were randomized

to either routine or restrictive episiotomy use¹³. No difference in perineal suturing rate was found among nullipara. However, the multipara had significantly higher rates of intact perineum and benefited from restrictive episiotomy policy¹³.

A randomized controlled trial conducted by Argentina Episiotomy Trial Collaborative Group¹⁴ found that the relative risk of severe perineal trauma was similar in both routine and selective groups irrespective of parity; 28 per cent fewer women in selective group required perineal suturing. They concluded that episiotomy rate of 30 per cent which was seen in the selective group was justified. They also reported an increase in the anterior tears in the selective group. In our study, a higher rate of anterior perineal trauma was observed in women who received episiotomy; however, this increase was significant only for multipara.

In a Cochrane systematic review of eight randomized controlled trials¹⁵ (six studies with mediolateral and two with median episiotomy practice) comparing effects of selective versus routine use of episiotomy, an overall less severe perineal trauma (RR= 0.67, 95% CI= 0.49 to 0.91), less posterior perineal trauma (RR 0.88, 95% CI 0.84 to 0.92), less suturing (RR 0.71, 95% CI 0.61 to 0.81) and fewer healing complications at seven days (RR 0.69, 95% CI 0.56 to 0.85) in the restrictive episiotomy group were

Table III. Distribution of episiotomy use and rate of perineal complications with ascending rates of instrumental delivery

Centre (No. of women with vaginal delivery)	N (%) Episiotomy	N (%) Instrumental deliveries	N (%) 3 rd /4 th degree PT	N (%) Composite complications [†]
Safdurjung, New Delhi (18120)	9465 (52.2)	410 (2.3)	17 (0.1)	219 (1.2)
KGH, Chennai (5255)	4040 (76.9)	132 (2.5)	0	0
Goa Medical College, Goa (11989)	9351 (78)	340 (2.8)	32 (0.3)	73 (0.6)
SSGH, Baroda (2960)	1329 (44.9)	89 (3)	0	39 (1.3)
IOG, Chennai (7716)	5231 (67.8)	302 (3.9)	2 (0.03)	919 (11.9)
RSRM, Chennai (7528)	5772 (76.7)	337 (4.5)	7 (0.1)	636 (8.5)
SAT, Thiruvananthapuram (6317)	5428 (85.9)	299 (4.7)	62 (1)	462 (7.3)
KEM, Mumbai (5176)	3345 (64.6)	250 (4.8)	6 (0.12)	61 (1.2)
KMCH, Chennai (3663)	1993 (54.4)	224 (6.1)	8 (0.22)	776 (21.2)
Guwahati Medical College, Guwahati (15445)	5923 (38.3)	1002 (6.5)	23 (0.15)	749 (4.8)
JNMC, Belagavi (1691)	579 (34.2)	114 (6.7)	0	130 (7.7)
PGIMER, Chandigarh (3238)	2172 (67.1)	255 (7.9)	1 (0.03)	345 (10.6)
Queen Mary's Hospital, Lucknow (2533)	1148 (45.3)	218 (8.6)	0	70 (2.8)
KEM, Pune (719)	627 (87.2)	71 (9.9)	0	43 (6)
SCB, Cuttack (5543)	2706 (48.8)	571 (10.3)	0	376 (6.8)
JIPMER, Puducherry (13271)	9838 (74.1)	1628 (12.3)	28 (0.21)	1140 (8.6)
Madurai Medical College, Madurai (7875)	6573 (83.5)	1151 (14.6)	0	538 (6.8)
AIIMS, New Delhi (1204)	785 (65.2)	195 (16.2)	0	237 (19.7)
Total (120243)	76305 (63.4)	7588 (6.3)	186 (0.15)	6810 (5.7)

[†]Includes anterior vaginal trauma requiring suturing (AVT), perineal tears (PTs) -1st, 2nd, 3rd and 4th degree, excessive bleeding from episiotomy or vaginal laceration, vaginal/vulvalhaematoma and extension of episiotomy.
r1, Correlation coefficient between % instrumental deliveries and % 3rd/4th degree PT = -0.236
r2, Correlation coefficient between % instrumental deliveries and % composite complications=0.4821
r3, Correlation coefficient between % overall episiotomy and % 3rd/4th degree perineal tear=0.0347
r4, Correlation coefficient between overall episiotomy rate and % composite complications = 0.02

reported. It concluded that evidence did not support routine episiotomy.

In our study, a higher rate of second degree perineal tear was seen among nullipara as compared to multipara who delivered without episiotomy. The third or fourth degree perineal tear rate was significantly lower among nullipara given episiotomy but not in multipara. A study from a tertiary care center in south India¹⁰ reported 1.6 per cent second degree perineal tear among multipara with routine use of episiotomy which was comparable to our results. After applying a policy of restricted episiotomy use; there was an increase in second degree perineal tear from nil to 13 per cent and

from 1.6 to 10 per cent among nullipara and multipara, respectively. Third and fourth degree perineal tear also increased from nil to 2 per cent only in the nullipara¹⁰. An observational study from public hospitals in Hong Kong indicated that the policy of routine episiotomy was associated with a significantly lower occurrence of any type of perineal tear and severe-degree (third or fourth degree) tear in nulliparous women than those without¹⁶.

Independent association of episiotomy with obstetric anal sphincter injuries (OASIS) was estimated from birth records in Finland from 2004-2011 using a cross-sectional and then a matched pair analysis¹⁷. The

Table IV. Distribution of complications in vaginal delivery in relation to parity and episiotomy

	Nullipara		OR 95% CI <i>P</i> value	Multipara		OR 95% CI <i>P</i> value
	With Episiotomy n=53993 (%)	Without Episiotomy n= 9448 (%)		With Episiotomy n=22312 (%)	Without Episiotomy n=34490 (%)	
Instrumental delivery	5305 (9.8)	425 (4.5)	2.18 1.97 to 2.41 <i>P</i> <0.001	1483 (6.6)	375 (1.1)	0.69 0.61 to 0.77 <i>P</i> <0.001
Anterior vaginal trauma requiring suturing (AVT)	300 (0.55)	46 (0.48)	1.1420 0.83 to 1.55 <i>P</i> =0.402	96 (0.43)	48 (0.13)	3.1006 2.19 to 4.38 <i>P</i> <0.001
2 nd degree perineal tear (PT)	NA	321 (3.4)	NA	NA	678 (1.9)	NA
3 rd & 4 th degree PT	72 (0.13)	59 (0.62)	0.2125 0.38 to 0.68 <i>P</i> <0.001	16 (0.07)	39 (0.11)	0.6339 0.35 to 1.13 <i>P</i> =0.124
Vulval/Vaginal haematoma	27 (0.05)	22 (0.23)	0.2144 0.12 to 0.37 <i>P</i> <0.001	4 (0.01)	17 (0.04)	0.3636 0.12 to 1.08 <i>P</i> =0.068
Extension of episiotomy/vaginal lacerations; excessive bleeding from episiotomy/tear	78 (0.14)	36 (0.38)	0.3782 0.25 to 0.56 <i>P</i> <0.001	19 (0.08)	44 (0.12)	0.6672 0.38 to 1.14 <i>P</i> =0.140

OR, Odds ratio; NA, not applicable

incidence of OASIS among nullipara with episiotomy was 2.3 and 1.0 per cent among women without episiotomy, and 0.6 and 0.2 per cent, respectively among multipara. A matched pair analysis showed a reduction in adjusted odds ratio of OASIS associated with episiotomy due to confounding by indication. The authors have concluded that the association between episiotomy and OASIS needs to be interpreted with caution in observational studies¹⁷. Therefore, a hospital policy of selective episiotomy might result in an increase in perineal tear but an overall reduction in rate of perineal suturing. The influence of maternal factors such as tight perineum, early bearing down, provider factors such as perineal support, flexion of head during delivery, good nursing care and perineal massage in late pregnancy for the prevention of perineal tears need to be evaluated further as some studies indicate protective role of perineal protection strategies^{18,19}.

The major limitation of this study was its observational study design with collection of only hospital level data. Late complications such as infection, pain, dyspareunia, *etc.* could not be

recorded. Indication for performing episiotomy was also not available in the records. A major strength of this study was direct information collected from labour room records and large sample size, which reflects the current episiotomy practice in public hospitals in India. The incidence of immediate perineal complications among vaginal deliveries has not been reported from tertiary care hospitals in India. This data will be useful to design interventional studies. It will also contribute towards developing guidelines for episiotomy use in the Indian context.

In this study population significantly lower rates of third or fourth degree perineal tear were seen among nullipara undergoing episiotomy. The risk and benefit of episiotomy and its indications especially for nullipara need to be evaluated through randomized clinical trials. There is also a need to evolve evidence based practice guidelines for use of episiotomy in India.

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Conflicts of Interest: None.

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