

12. REPEAT OBSTETRIC INTERVENTIONS AMONG MULTIPAROUS WOMEN GIVING BIRTH IN 2001

Introduction

Rates of obstetric interventions are of interest to consumers, clinicians and the community and are reported each year in this report.

We have not previously examined how rates of obstetric interventions might be influenced by the occurrence of an obstetric intervention in a previous pregnancy. In this chapter we look at the association between having an episiotomy, epidural anaesthetic, and instrumental or caesarean section delivery for the latest birth compared to the previous birth for women whose latest birth was in 2001.

Methods

NSW Midwives Data Collection (MDC) records of mothers giving birth in the period 1994–2001 were linked to create a data set containing a birth history for each mother. Linkage was carried out using probabilistic record linkage software (Automatch). Approval for the linkage was obtained from the NSW Department of Health Ethics Committee.

The linked data set contained 697,311 records, of which 371,090 (53.2 per cent) were matched records and 326,220 (46.8 per cent) were unmatched records. From the linked data set we selected records of multiparous mothers who gave birth in 2001 and who had a singleton pregnancy in the latest birth. Records of the latest birth and the previous birth were then selected. The reported number of previous pregnancies for each record pair was then compared for consistency and inconsistent records were excluded. For example, if the number of previous pregnancies reported on the most recent birth was 3 and the number reported on the previous birth was 1 then the record pair was excluded from the analysis. The data set was then restricted to births where both the latest and previous birth was singleton, at term (38–41 weeks gestation), and with a vertex presentation.

Descriptive analyses were carried out using SAS. Rates of epidural anaesthetic, episiotomy and type of delivery were compared for the latest birth versus the previous (most recent prior) birth. Analyses were stratified by the reported number of previous pregnancies at the latest birth. A comparison of maternal characteristics for records of births in 2001 that were included and excluded from the study was carried out.

Results

Of the 84,379 mothers who gave birth in NSW in 2001, 41,100 (48.7 per cent) were singleton pregnancies with a vertex presentation, where the birth occurred at term (38–41 weeks gestation) and a previous pregnancy of greater than 20 weeks was reported.

Of these, 29,850 (73 per cent) mothers had linked records for previous pregnancies and the linked records showed a consistent birth history. A further 4,478 mothers had previous births that fell outside the inclusion criteria for the study, leaving 25,372 records available for analysis.

Epidural anaesthetic

Epidural anaesthetic was examined for women whose latest and previous births were both by vaginal delivery. Women who had only one previous birth were more likely to have an epidural anaesthetic for their latest birth compared to women who had more than one previous birth (17 vs 10 per cent) (Table 131).

Women were more likely to have an epidural anaesthetic for the latest birth if they had received an epidural anaesthetic in the previous birth. Of women who gave birth in 2001 and had an epidural anaesthetic for their previous birth, 47 per cent had an epidural for their latest birth. The proportion was higher among women who had more than one previous birth (58 per cent) compared to women who had only one previous birth (45 per cent).

Of women who did not have an epidural anaesthetic for their previous birth, 95 per cent did not have an epidural for the latest birth. This pattern was similar for women who had one or more than one previous birth.

Episiotomy

Episiotomy was examined for women whose latest and previous births were both by vaginal delivery. Women who had only one previous birth were more likely to have an episiotomy in their latest birth compared to women who had more than one previous birth (11 vs 4 per cent) (Table 132).

Women were more likely to have an episiotomy for the latest birth if they had received an episiotomy in the previous birth. Of women who gave birth in 2001 and had an episiotomy in their previous birth, 25 per cent had an episiotomy for their latest birth. The proportion was slightly higher among women who had more than one previous birth (27 per cent) compared to women who had one previous birth (25 per cent).

Of women who did not have an episiotomy for their previous birth, 97 per cent did not have an episiotomy for their latest birth. The proportion was slightly lower among women who had more than one previous birth (2 per cent) compared to women who had one previous birth (4 per cent).

Type of delivery

Women who had more than one previous birth were more likely to have a normal vaginal delivery than women who had one previous birth (84 vs 78 per cent) (Table 133).

Ninety four per cent of women who gave birth in 2001 and whose previous birth was by normal vaginal delivery had a normal vaginal delivery in their latest birth. This pattern was the same for women who had one previous birth and women who had more than one previous birth.

For instrumental deliveries, 76 per cent of women whose previous birth was by forceps delivery and 78 per cent of women whose previous birth was by vacuum extraction had a normal vaginal delivery for their latest birth. Women who had an instrumental delivery and more than one previous birth were less likely to have a normal vaginal delivery in their latest birth than women who had only one previous birth.

Of women whose previous birth was by caesarean section (elective or emergency), 13.4 per cent had a vaginal delivery in the latest birth. This proportion was higher for women who had one previous birth (16.1 per cent), compared to women who had more than one previous birth (7.1 per cent). After excluding instrumental deliveries in the latest birth, these proportions fell. Of

women whose previous birth was by caesarean section, 9.2 per cent had a normal (unassisted) vaginal delivery in the latest birth, and this proportion was higher for women who had one previous birth (10.5 per cent), compared to women who had more than one previous birth (6.2 per cent).

Of women whose previous birth was by elective caesarean section, 86 per cent had an elective caesarean section in their latest birth, 7 per cent had an emergency caesarean section, and 5 per cent had a normal vaginal delivery. Women who had one previous birth were more likely to have a normal vaginal delivery in the latest birth compared to women who had more than one previous birth (9 vs 3 per cent).

Of women whose previous birth was by emergency caesarean section, 18 per cent had another emergency caesarean section in their latest birth, 66 per cent had an elective caesarean section, and 11 per cent had a normal vaginal delivery. The effect of parity was the inverse of that for elective caesarean section—women who had more

TABLE 131

EPIDURAL ANAESTHETIC IN THE LATEST AND PREVIOUS BIRTH BY NUMBER OF PREVIOUS BIRTHS#

| Number of previous births— epidural for latest birth | No epidural | | Epidural anaesthetic in previous birth | | Total | |
|---|-------------|-------|--|-------|-------|-------|
| | No. | % | No. | % | No. | % |
| 1 previous birth | | | | | | |
| No epidural | 8183 | 95.0 | 2046 | 55.0 | 10229 | 82.9 |
| Epidural | 434 | 5.0 | 1672 | 45.0 | 2106 | 17.1 |
| Total | 8617 | 100.0 | 3718 | 100.0 | 12335 | 100.0 |
| More than 1 previous birth | | | | | | |
| No epidural | 7464 | 95.1 | 385 | 42.5 | 7849 | 89.6 |
| Epidural | 388 | 4.9 | 521 | 57.5 | 909 | 10.4 |
| Total | 7852 | 100.0 | 906 | 100.0 | 8758 | 100.0 |
| Total | | | | | | |
| No epidural | 15647 | 95.0 | 2431 | 52.6 | 18078 | 85.7 |
| Epidural | 822 | 5.0 | 2193 | 47.4 | 3015 | 14.3 |
| Total | 16469 | 100.0 | 4624 | 100.0 | 21093 | 100.0 |

Source: *Linked NSW Midwives Data Collection 1994-2001. Centre for Epidemiology and Research, NSW Department of Health.*

Data relate only to those mothers where the latest and previous births were by vaginal delivery, occurred at term (38-41 weeks gestation), and had a vertex presentation.

TABLE 132

EPISIOTOMY IN THE LATEST AND PREVIOUS BIRTH BY NUMBER OF PREVIOUS BIRTHS#

| Number of previous births— episiotomy for latest birth | No episiotomy | | Episiotomy in previous birth | | Total | |
|---|---------------|-------|------------------------------|-------|-------|-------|
| | No. | % | No. | % | No. | % |
| 1 previous birth | | | | | | |
| No episiotomy | 8027 | 95.5 | 2957 | 75.2 | 10984 | 89.0 |
| Episiotomy | 375 | 4.5 | 976 | 24.8 | 1351 | 11.0 |
| Total | 8402 | 100.0 | 3933 | 100.0 | 12335 | 100.0 |
| More than 1 previous birth | | | | | | |
| No episiotomy | 7825 | 98.2 | 571 | 72.6 | 8396 | 95.9 |
| Episiotomy | 147 | 1.8 | 215 | 27.4 | 362 | 4.1 |
| Total | 7972 | 100.0 | 786 | 100.0 | 8758 | 100.0 |
| Total | | | | | | |
| No episiotomy | 15852 | 96.8 | 3528 | 74.8 | 19380 | 91.9 |
| Episiotomy | 522 | 3.2 | 1191 | 25.2 | 1713 | 8.1 |
| Total | 16374 | 100.0 | 4719 | 100.0 | 21093 | 100.0 |

Source: *Linked NSW Midwives Data Collection 1994-2001. Centre for Epidemiology and Research, NSW Department of Health.*

Data relate only to those mothers where the latest and previous births were by vaginal delivery, occurred at term (38-41 weeks gestation), and had a vertex presentation.

one previous birth were slightly more likely to have a normal vaginal delivery in the latest birth compared to women who had one previous birth (13 vs 11 per cent).

Comparison of included versus excluded records

Table 134 shows selected maternal characteristics for records that were included and excluded from the study. The total of 41,100 (48.7 per cent) refers to singleton pregnancies with a vertex presentation, where the birth occurred at term (38–41 weeks gestation) and a previous pregnancy of greater than 20 weeks was reported. The 11,250 records excluded comprise those where no match for a prior birth record could be found or where reporting of the number of previous pregnancies was inconsistent in the record pairs. Mothers whose records were available for analysis were more likely to be younger, born in Australia and have only one previous pregnancy. There was no substantial variation in health area of residence.

Discussion

Our results show that normal vaginal delivery followed a previous normal vaginal delivery in 94 per cent of women. Episiotomy, epidural anaesthetic, instrumental and caesarean section delivery were more likely to occur in the latest birth if they occurred in the previous birth, with highest rates for elective and emergency caesarean section.

These results apply only to the subset of multiparous women where both the latest and previous pregnancies

were singleton with a vertex presentation and were delivered at term. For episiotomy and epidural anaesthetic a further restriction was imposed, that is, of both latest and previous births being by vaginal delivery. Nevertheless, these women comprise a substantial proportion of mothers giving birth in 2001.

Only 73 per cent of eligible mothers had linked records for previous births and the linked records showed a consistent birth history. Factors that may have affected the number of records not available for analysis include:

- Records of previous births may not be linked when women change their names or addresses following marriage or divorce. This may account for the relatively higher exclusion rate for records of older mothers compared to younger mothers.
- Women who live close to interstate borders may give birth in an interstate hospital on one occasion and in a NSW hospital on another occasion. The comparison of included and excluded records suggests that this was not a major factor in this study.
- The relatively higher proportion of excluded records for overseas-born mothers suggests that previous births for some mothers may not have occurred in Australia.
- Errors in recording of the number of previous pregnancies resulted in inconsistencies in the birth history and these records were excluded from the analysis.

TABLE 133

TYPE OF DELIVERY IN THE LATEST AND PREVIOUS BIRTH BY NUMBER OF PREVIOUS BIRTHS#

| Number of previous births– type of delivery in latest birth | Normal vaginal | | Forceps | | Type of delivery in previous birth | | | | | | Not stated | | TOTAL | |
|---|-------------------|-------|---------|-------|------------------------------------|-------|---|-------|---|-------|------------|-------|-------|-------|
| | No. | % | No. | % | Vacuum extraction No. | % | Elective caesarean section No. | % | Emergency caesarean section# No. | % | No. | % | No. | % |
| 1 previous birth | | | | | | | | | | | | | | |
| Normal vaginal | 9044 | 94.4 | 1319 | 77.5 | 1311 | 79.3 | 39 | 8.9 | 199 | 10.9 | 2 | 66.7 | 11914 | 78.3 |
| Forceps | 63 | 0.7 | 71 | 4.2 | 40 | 2.4 | 4 | 0.9 | 54 | 2.9 | 0 | 0.0 | 232 | 1.5 |
| Vacuum extraction | 179 | 1.9 | 106 | 6.2 | 198 | 12.0 | 7 | 1.6 | 63 | 3.4 | 0 | 0.0 | 553 | 3.6 |
| Elective caesarean section | 136 | 1.4 | 121 | 7.1 | 53 | 3.2 | 347 | 79.2 | 1195 | 65.2 | 1 | 33.3 | 1853 | 12.2 |
| Emergency caesarean section# | 153 | 1.6 | 86 | 5.0 | 52 | 3.1 | 41 | 9.4 | 322 | 17.6 | 0 | 0.0 | 654 | 4.3 |
| Not stated | 2 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| Total | 9577 | 100.0 | 1703 | 100.0 | 1654 | 100.0 | 438 | 100.0 | 1833 | 100.0 | 3 | 100.0 | 15208 | 100.0 |
| More than 1 previous birth | | | | | | | | | | | | | | |
| Normal vaginal | 8239 | 94.1 | 107 | 60.1 | 157 | 70.7 | 20 | 2.9 | 42 | 13.4 | 3 | 100.0 | 8568 | 84.3 |
| Forceps | 46 | 0.5 | 14 | 7.9 | 4 | 1.8 | 0 | 0.0 | 2 | 0.6 | 0 | 0.0 | 66 | 0.6 |
| Vacuum extraction | 140 | 1.6 | 18 | 10.1 | 29 | 13.1 | 3 | 0.4 | 4 | 1.3 | 0 | 0.0 | 194 | 1.9 |
| Elective caesarean section | 179 | 2.0 | 29 | 16.3 | 23 | 10.4 | 626 | 91.0 | 212 | 67.5 | 0 | 0.0 | 1069 | 10.5 |
| Emergency caesarean section# | 154 | 1.8 | 10 | 5.6 | 9 | 4.1 | 39 | 5.7 | 53 | 16.9 | 0 | 0.0 | 265 | 2.6 |
| Not stated | 1 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.3 | 0 | 0.0 | 2 | 0.0 |
| Total | 8759 | 100.0 | 178 | 100.0 | 222 | 100.0 | 688 | 100.0 | 314 | 100.0 | 3 | 100.0 | 10164 | 100.0 |
| Total | | | | | | | | | | | | | | |
| Normal vaginal | 17283 | 94.3 | 1426 | 75.8 | 1468 | 78.3 | 59 | 5.2 | 241 | 11.2 | 5 | 83.3 | 20482 | 80.7 |
| Forceps | 109 | 0.6 | 85 | 4.5 | 44 | 2.3 | 4 | 0.4 | 56 | 2.6 | 0 | 0.0 | 298 | 1.2 |
| Vacuum extraction | 319 | 1.7 | 124 | 6.6 | 227 | 12.1 | 10 | 0.9 | 67 | 3.1 | 0 | 0.0 | 747 | 2.9 |
| Elective caesarean section | 315 | 1.7 | 150 | 8.0 | 76 | 4.1 | 973 | 86.4 | 1407 | 65.5 | 1 | 16.7 | 2922 | 11.5 |
| Emergency caesarean section# | 307 | 1.7 | 96 | 5.1 | 61 | 3.3 | 80 | 7.1 | 375 | 17.5 | 0 | 0.0 | 919 | 3.6 |
| Not stated | 3 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 0 | 0.0 | 4 | 0.0 |
| Total | 18336 | 100.0 | 1881 | 100.0 | 1876 | 100.0 | 1126 | 100.0 | 2147 | 100.0 | 6 | 100.0 | 25372 | 100.0 |

Source: *Linked NSW Midwives Data Collection 1994–2001. Centre for Epidemiology and Research, NSW Department of Health.*

Emergency caesarean section includes caesarean sections where the onset of labour was not stated. Data relate only to those mothers where the latest and previous births occurred at term (38–41 weeks gestation) and had a vertex presentation.

The recurrence rates of obstetric interventions were: epidural anaesthetic, 47 per cent; episiotomy, 25 per cent; forceps delivery, 5 per cent; vacuum extraction, 12 per cent; elective caesarean section, 86 per cent; and emergency caesarean section, 66 per cent. The number of previous births had little effect on episiotomy rates, and a substantial effect on elective caesarean section.

The rate of elective caesarean section following previous elective caesarean section for women with more than one previous birth (91 per cent) is particularly high, and may be due to mothers with repeat previous caesarean sections.

The Australian Council on Healthcare Standards clinical indicator *the rate of vaginal delivery after primary caesarean section* was 18.4 per cent in NSW in 2001.¹ We found that, of women whose previous birth was by caesarean section, 13.4 per cent had a vaginal delivery in the latest birth. However this includes women with more than one previous caesarean section. For women who had only one previous birth that was by caesarean section, we found that 16.1 per cent had a vaginal delivery in the latest birth. Our relatively lower results may be due to differences in definition, as our study was of births at term with a vertex presentation and we did not distinguish

primary from repeat caesarean sections among women with more than one previous birth.

Women who had more than one previous birth and an epidural anaesthetic in the previous birth were more likely to have an epidural anaesthetic for the latest birth, compared to women with only one previous birth. This small proportion of women (4.3 per cent) may have, from their earlier birth experiences, developed a preference for epidural anaesthetic for pain relief during labour.

This study used linked routinely collected MDC data to provide population based information on recurrence rates of selected obstetric interventions in NSW. The risk of recurrence of these interventions may also be affected by the presence of chronic medical conditions in the mother - information that is not readily available on the MDC. Nevertheless, this study shows that linkage of routinely collected MDC data is useful for obtaining information on health and health care at a population level.

Reference

1. Centre for Epidemiology and Research, NSW Department of Health. New South Wales Mothers and Babies 2001. *N S W Public Health Bull* 2002;13 (S-4).

TABLE 134

MATERNAL CHARACTERISTICS OF INCLUDED AND EXCLUDED RECORDS

| Characteristic | Record status | | | | Total | |
|---------------------------------------|------------------|-------|------------------|-------|-------|-------|
| | Exclusion No. | % | Inclusion No. | % | No. | % |
| 1 previous birth | | | | | | |
| <25 | 1170 | 10.4 | 4233 | 14.2 | 5403 | 13.1 |
| 25-34 | 6782 | 60.3 | 19743 | 66.1 | 26525 | 64.5 |
| 35+ | 3267 | 29.0 | 5871 | 19.7 | 9138 | 22.2 |
| Not stated | 31 | 0.3 | 3 | 0.0 | 34 | 0.1 |
| Total | 11250 | 100.0 | 29850 | 100.0 | 41100 | 100.0 |
| Health area of residence | | | | | | |
| Central Sydney | 833 | 7.4 | 2068 | 6.9 | 2901 | 7.1 |
| Northern Sydney | 1020 | 9.1 | 3164 | 10.6 | 4184 | 10.2 |
| Western Sydney | 1572 | 14.0 | 3805 | 12.7 | 5377 | 13.1 |
| Wentworth | 580 | 5.2 | 1758 | 5.9 | 2338 | 5.7 |
| South Western Sydney | 1649 | 14.7 | 4395 | 14.7 | 6044 | 14.7 |
| Central Coast | 438 | 3.9 | 1405 | 4.7 | 1843 | 4.5 |
| Hunter | 820 | 7.3 | 2395 | 8.0 | 3215 | 7.8 |
| Illawarra | 543 | 4.8 | 1598 | 5.4 | 2141 | 5.2 |
| South Eastern Sydney | 990 | 8.8 | 2986 | 10.0 | 3976 | 9.7 |
| Northern Rivers | 483 | 4.3 | 980 | 3.3 | 1463 | 3.6 |
| Mid North Coast | 429 | 3.8 | 1058 | 3.5 | 1487 | 3.6 |
| New England | 352 | 3.1 | 868 | 2.9 | 1220 | 3.0 |
| Macquarie | 260 | 2.3 | 599 | 2.0 | 859 | 2.1 |
| Mid Western | 371 | 3.3 | 851 | 2.9 | 1222 | 3.0 |
| Far West | 89 | 0.8 | 202 | 0.7 | 291 | 0.7 |
| Greater Murray | 397 | 3.5 | 965 | 3.2 | 1362 | 3.3 |
| Southern | 313 | 2.8 | 602 | 2.0 | 915 | 2.2 |
| Not Stated/Other | 111 | 1.0 | 151 | 0.5 | 262 | 0.6 |
| Total | 11250 | 100.0 | 29850 | 100.0 | 41100 | 100.0 |
| Country of birth | | | | | | |
| Australia | 7022 | 62.4 | 22935 | 76.8 | 29957 | 72.9 |
| Other | 4228 | 37.6 | 6915 | 23.2 | 11143 | 27.1 |
| Total | 11250 | 100.0 | 29850 | 100.0 | 41100 | 100.0 |
| Number of previous pregnancies | | | | | | |
| 1 | 5744 | 51.1 | 18158 | 60.8 | 23902 | 58.2 |
| >1 | 5469 | 48.6 | 11692 | 39.2 | 17161 | 41.8 |
| Not stated | 37 | 0.3 | 0 | 0.0 | 37 | 0.1 |
| Total | 11250 | 100.0 | 29850 | 100.0 | 41100 | 100.0 |