Unequal treatment: a feasibility study into epidural pain relief in childbirth

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Abstract: Obstetric data published by New Zealand's Ministry of Health (MoH) has demonstrated the existence of disparity between Māori and non-Māori in the provision of epidural pain relief in childbirth. The purpose of this study was to determine the feasibility of a larger study into the causes of disparity. Studies of ethnic disparity in obstetric pain relief were reviewed and then the sources of New Zealand data were investigated for their ability to provide useful information. Finally a small sample of obstetricians, anaesthetists, and midwives in Wellington were interviewed in order to gain insight that would hopefully stimulate further thought and discussion. Other studies showed that socioeconomic status, maternal education and age, and parity are influenced by ethnicity, and impact on whether a woman will receive epidural analgesia: as is the ability of clinical staff of ethnicities different to that of the woman in childbirth to accurately assess her level of pain. MoH data was found to be gathered from maternity provider funding claims rather than patient notes, there was no official definition of epidural analgesia, and local data gathering initiatives are not able to be interfaced with each other or the MoH data. In conclusion, potential sources of disparity were identified, but a larger study into disparity of epidural analgesia cannot be achieved using the available data. A study could be achieved by liaising with key providers to recruit a random sample of women who have recently given birth, using inpatient records for data collection.

Keywords: childbirth, disparities, epidural, Māori.

Introduction

Disparities in healthcare have been demonstrated to exist in Aotearoa, New Zealand: a situation which has doubtless been exacerbated by a "universal" approach to healthcare which fails to acknowledge a multi-ethnic population base. The Crown, though, has adopted a commitment to reducing disparities between Māori and non-Māori (Reid et al, 2000). Nevertheless disparities are still poorly understood. Where studies have been conducted they have yielded information of limited use because of the low numbers of Māori recruited as participants (Reid et al, 2000). This in some way reflects occurrences overseas where study results have been compromised by inadequate sample size. Clinicians participating in New Zealand studies have perceived factors such as cost, co-morbidity, patient understanding, patient preference and communication to contribute to healthcare disparities, but mostly they have not identified ethnicity as a factor (McLeod et al, 2004). Even so, data produced by the New Zealand Ministry of Health and recorded in the Report of Obstetric Procedures 1999 as well as the Report on Maternity from 1999 through to the most recently available report (2002) do identify ethnic disparities in maternity care, including the provision of epidural pain relief.

A large number of international studies conducted since 1960 have exposed health systems in which there exist significant disparities in health care. In the United States, African Americans and patients of other "minority groups" have received a lower standard of health care than white Americans (Cooper-Patrick et al, 1999). Disparities have also been demonstrated to exist after adjusting for socioeconomic differences and factors associated with access to healthcare, and occur in the context of these wider social and economic inequalities (Smedley et al, 2002).

After adjusting for potential confounders in the patient-physician relationship it has been found that the degree of concordance of race/ethnicity between patient and physician impacts on the level of patient participation in any consultation (Cooper-Patrick et al, 1999). Lack of concordance has been

identified as a potential barrier to effective communication and to the establishment of a satisfying partnership. Where patient and physician share the same racial/ethnic background they are more likely to be able to communicate with one another more effectively (Cooper-Patrick et al, 1999).

At this point we should briefly pause to examine the terms "race" and "ethnicity". Many researchers in the field of healthcare disparities have used those terms interchangeably, thereby creating uncertainty in their audiences (Lasch, 2000). Both race and ethnicity are social constructs. Neither has any basis in biology, and as considerable cultural heterogeneity can exist within a "racial group" it is apparent that race and ethnicity are not at all interchangeable. Response to pain could, though, be attributed to biopsychosocial factors that influence ethnic self-identification: factors such as social, cultural, psychological, and political characteristics (Edwards et al, 2001).

Perceived patient ethnicity has been shown to be a strong predictor for non-provision of analgesia, physicians possibly being less likely to perform a pain assessment for patients who belong to certain ethnic groups (Todd et al, 1993, 1994). A factor which has been hypothesised to have influence on physician appraisal and response is the way in which individuals of different ethnicities tolerate pain, and the impact of any coping strategy on the outward expression of that pain (Edwards et al, 2001). There is as yet no indication of the degree of influence on physician bias of factors such as financial and staffing pressures of the healthcare facility or the predominant socioeconomic status of the patient base, all of which are important to the study of healthcare disparities (Bonham, 2001). Furthermore most studies into disparities of pain relief have been limited by all, or a combination of, the following factors: small sample size, retrospective study reliant on accurately recorded medical information, classification of race/ethnicity which may be inconsistent within one study and which is likely to be inconsistent across studies (Bonham, 2001).

In assessing pain, physicians and other clinical staff rely at least in part on the patients' own report of the pain severity. When pain has been reported as low, there has generally been strong agreement between patient and clinician. However when pain has been reported as severe, the patients' report is often dismissed until the clinical staff is presented with confirmatory evidence. Furthermore, patients reporting severe pain are more subject to stereotyping: as are patients of racial/ethnic minorities (Green et al, 2003). This raises two important considerations: pain severity as a covariate, and the implications for any study concerned with childbirth pain, which is generally accepted to be one the severest pains that any woman will experience.

Most people see pain as a normal part of childbirth and, as such, pain is invariably expected (Callister et al, 2003). The same issues surrounding the management of pain in an obstetric setting, as in other settings such as the Emergency Department, appear to be present. Where ethnic incongruity exists between the medical staff and the woman in labour, there generally exists incongruence between the medical staff's rating of pain and the pain experience of the woman in labour (Sheiner et al, 2000; Callister et al, 2003).

The aim of this study is to assess the feasibility of committing to a research programme designed to identify the source(s) of disparity in the provision of epidural pain relief in childbirth between Māori and non-Māori, and to provide explanations. The study undertakes: (1) a review of the literature relevant to labour pain and its amelioration, specifically by epidural analgesia, in the context of ethnicity, and any possible associations between ethnicity, socioeconomic deprivation, rurality, region, type of delivery, and myths, assumptions and stereotypes; (2) identification of relevant data sources and a review of those sources for completeness and suitability for further analysis; and (3) interviews with midwives, obstetricians, and anaesthetists in order to gain an understanding of the relevant datasets, as well as their views on pain relief procedures, trends, and differential pain management.

Literature review

An extensive literature search of electronic databases and the worldwide web was conducted, as well as retrieving relevant literature from the bibliographies of published research. Most of the papers written on disparities in obstetric pain relief emanate from the United States.

Hueston et al (1994) evaluated socioeconomic influence on the provision of epidural analgesia in childbirth to determine the influence of patient and provider characteristics in the decision-making process. They went about this by retrospectively reviewing 8229 deliveries at five US hospitals, in different states. To identify potential biases and confounding variables they employed bivariate analysis and logistic regression. Their results showed that white women who were privately insured were more likely to receive epidural analgesia than other women. Furthermore, these women were more likely to be receiving their care from a specialist obstetrician. Parity (the number of births a woman has experienced) was also a significant factor. Parous women under the care of an obstetrician were twice as likely to receive an epidural as were nulliparous women, and parous women under the care of a family physician or midwife were four times less likely to receive epidural analgesia than those under the care of an obstetrician: and this was after additional analysis for difference in risk factors. In the one hospital that had a large non-white population, an association between race and epidural analgesia was demonstrated.

There was considerable variation in results between the sites and the study authors concluded that several factors influenced whether a woman would receive epidural analgesia. Availability of anaesthetists, patient and physician attitudes to epidural analgesia, and institutional policies were noted, as were parity, insurance status, and maternal age. The authors also noted the possibility of patient self-selection bias: the selection of a Lead Maternity Carer (LMC) based upon preference for or against an epidural, and the perception that an obstetrician is the most likely to provide this form of analgesia. Whilst an association had been made between race and receipt of an epidural, the study authors did not arrive at any conclusions.

Many variables have been associated with labour pain in its broadest context, such as age, parity, the woman's usual weight, the weight of the baby, uterine contractions, cervical dilatation, position of the woman during labour, anxiety, levels of support, previous experience of pain unrelated to labour, painful menstruation, cortisol levels, socioeconomic status, educational level – and ethnicity. Sheiner et al (1999) published a prospective study which investigated the influence of ethnicity upon the interpretation of pain between the patient and the care provider. The study was conducted in this way as women tend to devaluate labour pain after delivery, making retrospective measurements questionable.

The subjects of the study were Jewish and Bedouin women in labour living in the same part of Israel and sharing the same medical facilities. A Visual Analogue Scale (VAS) was used by both the women and the Jewish doctor and midwife to record pain intensity during the initial active phase of labour and again the day after delivery to record the present pain intensity level. Before proceeding further, though, it should be acknowledged that the study authors made reference to studies of Arab populations in which "Bedouin deliveries were remarkable for the absence of pain behaviour" (p303).

During the initial active phase of labour the Jewish and Bedouin women reported similar levels of pain intensity (8.55 and 8.53 respectively on the VAS, $P = 0.25$), but the Jewish medical staff interpretation of the levels of pain intensity gave the Bedouin women a significantly lower level than that of the Jewish women (6.89 vs 8.52 respectively on the VAS, $P < 0.001$). Epidural analgesia was thus offered significantly more often to Jewish women than Bedouin women (63.4% vs 36.6% respectively, $P < 0.001$). Self-reported pain levels were again similar on the day following delivery with Jewish women reporting a score of 2.02 on the VAS and Bedouin women reporting a score of 2.11 ($P = 0.52$). The correlation between self-reported pain and that assessed by the Jewish medical staff was again higher for Jewish women than Bedouin women (0.74 and 0.63, respectively). The results of a multiple linear regression analysis of both the self-reported and observed pain scores showed a significant association with ethnicity and parity.

The study authors acknowledged that the difference in the care-giver's estimation of pain could be due either to factors within the medical staff, or factors related to the pain behaviours of the two groups. They concluded that misinterpretation of the Bedouin women's pain was at least in part due to the failure of the Jewish care-giver to recognise that pain, and that the ethnic background of the care provider is therefore an important factor in the estimation of patient pain. Important, too, is clinician awareness of a spectrum of factors that may influence the expression of pain and, hence, its evaluation; especially if clinicians are to avoid stereotyped responses.

Also important are attitudes of obstetric providers towards epidural analgesia. Graninger and McCool (1998) conducted a US national survey to explore the attitudes of midwives toward epidural analgesia in childbirth. Midwife care has traditionally been supportive and non-interventionist. Consequently the study authors hypothesised that some midwives may find that epidural analgesia is incongruent with commonly accepted midwifery philosophy. They did acknowledge, though, that the experience of childbirth pain is also influenced by non-clinical factors such as socioeconomics and culture, and also that institutional policies and availability of services influence the provision of pain relief. Research questions covered such things as the extent to which midwives have integrated epidural analgesia into their practice, and the factors that influence their attitudes toward it.

Half of the midwives on the register of the American College of Nurse-Midwives were randomly selected. There were 1,605 respondents (60.7%). Just over half of them (53%) expressed a negative attitude towards epidural pain relief, with the same percentage believing that "experiencing labour pain is a valuable experience for most women". The midwives were almost evenly split over whether they should discourage women from using epidural pain relief. Generally, midwives did not feel that epidural analgesia was appropriate unless medically indicated though *most supported the woman's right to choose* (my italics). The motive for that support was not stated but 59% felt that if they earned a reputation for being opposed to epidural analgesia they would lose "marketability" as a maternity care provider. Although the primary birth site of 87% of the respondents had epidural analgesia available, the mean rate of use by midwives was 26%. No comparative data with other obstetric providers was available.

The study authors concluded that midwives must address the provision of epidural analgesia within the context of their own philosophy so that they are clear as to how they will respond when women demand an epidural as their right, how they will educate women on the risks and benefits of epidural analgesia, and how they will comply with the woman's request without compromising their own values.

In the United States of America, Atherton et al (2004) queried the influence of a woman's insurance status upon her receipt of an epidural. They hypothesised that after controlling for maternal age and delivery complications that the rates of epidural analgesia would differ by race/ethnicity and by type of insurance. The study authors achieved a nationally representative sample of 1003 subjects. Inclusion criteria were a normal singleton vaginal delivery in a hospital, and the exclusion criteria were non-live or non-singleton deliveries, or a birth outside a hospital setting. Also excluded were women for whom there was inadequate information regarding race/ethnicity or insurance type.

It was found that women who were members of public insurance schemes were almost twice as likely to not receive epidural analgesia compared to women who were privately insured (AOR 1.768, 95% CI 1.301-2.402). The risk to women who were uninsured was moderately increased (AOR 1.254, 95% CI 0.821-1.915) but was not considered statistically significant. The study authors did not consider race to be a significant risk factor for non-receipt of epidural analgesia in childbirth, but a strong association was demonstrated between ethnicity and non-receipt. Hispanic women were twice as likely to not receive epidural analgesia compared to white non-Hispanic women (AOR 2.023, 95% CI 1.522-2.689). This result was considered to be consistent with the emerging pattern of health care disparities in the United States.

The study authors reasoned that as ethnicity rather than race determined the likelihood of receiving epidural analgesia, there must be culturally-based characteristics at play. Their study, though, did not enable any of these characteristics to be identified or teased out and the authors suggested that some sort of systematic interaction might be responsible. Again, with respect to insurance type no firm conclusions were arrived at as the separation of any relevant variables was outside the scope of the study. The authors did query, though, if women were less likely to demand interventions such as epidural analgesia if they are receiving public insurance (some insurance schemes are reluctant to pay out when analgesia is not "clinically indicated"). Finally the authors were able to conclude that the study findings would suggest that a need exists for a national policy concerning the delivery of epidural analgesia in childbirth, and that such policy should be driven by medical philosophy and practice rather than patient socioeconomics or ethnicities.

That same year Rust et al published their study examining racial and ethnic differences amongst women aged 15-44 years who were insured by Medicaid and who received epidural analgesia during childbirth. Claims data were referred to in order to identify the claims for epidural analgesia among women in the state of Georgia who had a normal vaginal delivery during 1998. There were 29,833 women who had vaginal deliveries, of whom 46.6% were Caucasian, 46.9% were African-Americans, 5% were Hispanic, and 1.5% were Asian. There were also 20 vaginal deliveries to American Indian/Alaskan Native women but this number was considered too low for analysis and these births were excluded from the study. Of those women who had vaginal deliveries, 15,936 (53.4%) received epidural analgesia. The results showed that white non-Hispanic women had a higher rate of epidural analgesia (59.6%) than women of other racial or ethnic groups that could be identified. The rates for African-American women were 49.5%, Asian women 48.1%, and Hispanic women 35.3% ($P<0.001$). Hispanic women, irrespective of age, had the lowest rate of epidural procedure and those aged 30-44 years received epidural analgesia at a rate approximately half that of white non-Hispanic women. There was also a disparity between the rural epidural rate of 39.2%, and the urban rate of 62.1% ($P<0.001$), within which racial/ethnic disparities were maintained.

After controlling for age, rurality, and availability of anaesthetic services the study authors concluded that in this cohort of women who had identical insurance and who met the same eligibility criteria, race/ethnicity was a significant predictor of the provision of epidural analgesia.

Several factors were identified with respect to patient, provider, and system/institution. Patient factors which could influence requests for epidural analgesia were given as maternal age, education, culture, and parity: there was a significant association between increasing maternal age and decreasing use of epidurals across all racial/ethnic groups. This study was unable to capture important factors such as personal pain perceptions and cultural values. Provider factors which could influence provision of epidural analgesia were suggested to be the provider's own ethnicity and language skills beyond their first language, and attitudes towards epidural analgesia. Systemic factors were identified as being the maldistribution throughout the state of anaesthetists, and the under-representation of minority groups within the health professions. Thus the study yielded a number of potential explanations for the existence of racial/ethnic disparities in the provision of epidural pain relief in one Southern state. Finally, the study authors concluded that "these … disparities … are quite troubling and require further research to ascertain their causes."

New Zealand literature

The literature search yielded very few studies that had been conducted in a New Zealand setting. Most of the limited amount of literature that included both epidural pain relief in childbirth and ethnic disparities appeared in the Report of Obstetric Procedures 1999 [3] and the Report on Maternity from 1999 through to the most recently available report (2002 data published in 2004). It was prior knowledge of the information recorded in these publications that confirmed the existence of ethnic disparity in the context of labour analgesia.

In 1999 the MoH published the Report of Obstetric Procedures. The report provided a basic analysis of the National Minimum Dataset (NMDS) data held by the New Zealand Health Information Service (NZHIS) of the MoH. Information had been collected and reported by all of New Zealand's public hospitals, and entered by hospital coders.

The decade reported on was one of considerable upheaval in the health sector. As such, consistent detail throughout the period was difficult to achieve. However, in the final two years of the period more detailed information was available which allowed for greater analysis of obstetric procedures. It was then that relationships between ethnicity, socioeconomic deprivation, region, and rates of procedures started to become apparent. In that 2-year period, only 15% of Māori and Pacific Island women received epidural analgesia in childbirth compared with 25% of all other women who gave birth. When epidural analgesia was linked to socioeconomic deprivation, only 17% of the most deprived received an epidural compared with 30% of the least deprived. The executive summary of the report makes the point that many conditions that could lead to increased clinical need for intervention occur in Māori and Pacific women and those of lower socioeconomic standing, and yet they appear to be least likely to receive such intervention. Many Māori and Pacific women are of lower socioeconomic standing.

The data also exhibited considerable variation in rate of epidural analgesia amongst the country's health regions. In 1996/97 2.9% of deliveries in the region serviced by Canterbury Health involved epidural analgesia vs. 37% in the Nelson-Marlborough Health region and whilst the rates increased in most regions over the next 12 months, and the top and bottom spots went to other regions, a comparable spread remained evident in the next year's figures. Generally speaking rural and deprived regions showed rates below the national average (which in 1997/98 was 24%) and urban and affluent regions showed rates above the national average. This report also demonstrated a weak relationship between epidural analgesia and age of the birthing woman, with a reduction in rate of epidural associated with increasing age.

As with the Obstetric Procedures report, the annual Report on Maternity largely only provides data with little interpretation. In 1999 there was a significant increase in the rate of epidural analgesia amongst those under 16 years of age compared with all other age groups with rates of 35.6% of Māori and 41.7% of European/Others. Across the remaining age groups the average rate for Māori was 11.9%, and the average rate for European/Others was 26.6%. The population average across all groups was 22.8%.

The next report covered 2 years and showed a similar situation, though rates had increased for Māori. Those under 16 years of age continued to show increased rates when compared with all age other groups with an average rate for the 2 years of 26.6% for Māori and 52.8% for European/Others. Across the remaining age groups the average rate for the period for Māori was 14.1%, and the average rate for European/Others was 27.7%. The population average across all groups was 25%.

The latest available (2002) report showed rates of epidural analgesia which were fairly constant across all age groups, but the differential between Māori and European/Others was maintained. The rate for Māori was 13.9%, and the rate for European/Other was 27.3%. As with the earlier Obstetric Procedures report, this Report on Maternity continued to exhibit considerable variation in rate of epidural analgesia amongst the country's health regions. The range of rates remained comparable to the 1996/97 figures and the highest and lowest rates were in the Hawke's Bay District Health Board (DHB) (42.9%) and the West Coast DHB (3.4%) respectively. There was no interpretation of these results.

Within the Capital and Coast District Health Board (CCDHB) the Women's Health Service issues an annual Maternity and Gynaecology Service Report. The latest available report covers the 2004 calendar year and contains data from the Perinatal Information Management System (PIMS). The maternity section contains an overview of birth outcomes for mothers and babies, as well as information concerning maternal ethnicity, age, demographics, and parity; caesarean sections;

gestation at birth; foetal presentation; and interventions. As only birth outcomes are presented with past years data it is not possible to determine trends from much of what is reported without consulting the reports of earlier years.

Maternal ethnicity data showed that 14.1% of women having babies in 2004 were Māori, and that they were less likely than European/Others to have an obstetrician as their lead maternity carer (LMC) (2.6% cf. 19.7%). Most Māori women had a midwife as LMC (85.7%), which would decrease the likelihood of receiving epidural analgesia, but Māori women were the highest user group to book the 'high risk' Hospital Team as LMC (10.7%) which would increase the likelihood of obstetric intervention. The anaesthetic report does not offer an ethnic description of obstetric analgesia.

Johnson, Lewis, and Ansell (1995) published their study which aimed to see if the high proportion of Māori and Pacific Island women giving birth at Middlemore Hospital was contributing to the low rate of delivery intervention at that centre. The focus of the study was somewhat broad and included different types of instrumental delivery and caesarean section, as well as epidural analgesia. The birthing details of a cohort of women who gave birth at Middlemore Hospital between 1 May 1992 and 30 April 1993 were retrospectively examined for ethnicity, and details of any obstetric interventions.

The results of the study did not show a statistically significant difference in the rate of epidural analgesia between Māori and Pacific Island women, but the use of epidural analgesia by Pākehā women was significantly greater, irrespective of parity. Having identified such a difference, the study authors proposed a brief possible explanation which by their admission was anecdotal. They hypothesised that Māori and Pacific Island women have a positive approach to labour, an expectation of a natural birth, and an ability to cope with labour pain. The authors noted that these attributes were generally combined with "positive cultural influences" which included the support of female family members whilst in labour and that a reduced need for obstetric interventions (including epidural analgesia) was the result. They did observe, though, that the attitudes towards Māori and Pacific Island women by obstetric providers should be evaluated. The study authors concluded that the high proportion of Māori and Pacific Island women giving birth at Middlemore Hospital does contribute to the rate of epidural analgesia and other childbirth interventions, and that further investigation is required.

In response to the NZ MoH Obstetric Procedures Report (1999) which demonstrated ethnic disparities in obstetric interventions after correcting for maternal age, Sadler, McCowan, and Stone (2002) conducted a retrospective study to determine if the data appearing in the Obstetric Procedures Report would be replicated at Auckland's National Women's Hospital (NWH) after controlling for parity and obstetric risk. Ethnicity of women in childbirth was recorded as Māori, Pacific Island, or "Other" to ensure that the groupings were comparable to the Obstetric Procedures Report, and only one ethnic affiliation was recorded for each woman. Data was retrieved from the NWH records for 1992 – 1999 to provide a study population of 43, 367 singleton deliveries to mothers who had no previous history of caesarean section. Obstetric interventions were examined at the beginning of the birth process (either commencement of labour or pre-labour caesarean section) and at the time of delivery.

Data analysis was limited by the data collected by NWH over the period in question but the study authors did find that the rates of all obstetric interventions were significantly lower for both Māori and Pacific Island women than for the "other" group, though there was no difference in caesarean section between Māori and Pacific women. Half of the women in the "other" group received epidural analgesia during childbirth, whereas only one third of Māori women and slightly fewer Pacific women received an epidural. The study authors suggested that this may partly account for the lower rates of forceps and vacuum deliveries amongst these women as epidural analgesia tended to lead to an increase in the rate of this procedure. However, epidural analgesia was not specifically addressed by this study and no meaningful analysis of the data concerned with it was performed.

Conclusion

Most of the international literature that has been identified came from studies that had been conducted in the US and, with the exception of one Israeli study, none have included an indigenous population in their sampling. The studies were generally retrospective in approach, and sought to evaluate factors that may impact on the provision of epidural analgesia in childbirth: factors such as socioeconomic influences, insurance coverage, race/ethnicity specifically, midwife attitudes, and interpretation of patient pain by clinical providers. Two important factors that have not been studied are the attitudes of women, and obstetric service providers other than midwives, towards epidural analgesia.

The range of approaches to the issues of pain relief in childbirth and disparities in care yielded some common results. The provision of epidural analgesia was shown to be influenced either directly by ethnicity – inaccurate assessment of labour pain by clinicians of different ethnicity; low availability of clinicians of different ethnicities; language problems; clinician attitudes; and patient cultural values – or indirectly influenced – patient bias introduced by choice of, or access to, LMC; insurance status; and maternal age, education status, and parity. Other important factors were also demonstrated, such as availability of clinical services and policies of healthcare providers. It can be seen that the woman having the baby, her LMC, and the health system within which they are functioning all impact on the provision/receipt of epidural analgesia. In broad terms, service availability, bias, stereotyping, communication, health literacy, and expectations will all influence the delivery of appropriate obstetric analgesia.

Despite the influence of insurance status, and the absence of indigenous women from most of these studies, the results provide information that is nevertheless useful in the New Zealand setting. As yet no New Zealand literature focuses on epidural analgesia: its provision has only been observed within broad studies on disparities in obstetric care. One such study was conducted before the MoH published the 1999 Obstetric Procedures report which highlighted the existence of a disparity in obstetric care between Māori and non-Māori, and the other was a study specific to one provider in response to that report. Neither study contributed anything that could explain this disparity. Given the evidence confirming disparity between Māori and non-Māori in the provision of epidural pain relief in childbirth, the evidence gathered internationally, and the lack of demonstrated understanding of the mechanisms of disparity, further investigation is required.

Data mapping

Another aspect of the study was to consider the different data sources available. The Maternity and Newborn Collection (MNIS) is a data collection service co-ordinated by the New Zealand Health Information Service (NZHIS). It provides maternity and newborn information from up to 9 months before birth through to 3 months post-birth. Inpatient data is retrieved from the National Minimum Dataset (Hospital Events) (NMDS) and recorded, as is funding data concerning payments from the Crown or DHBs to the maternity service providers as required per Section 88 of the New Zealand Public Health and Disability Act 2000 (and prior to that, Section 51 of the Health and Disability Act 1993). All pregnancies since October 2002 should be recorded but only about 70% of those prior to then (and since 1998 when the collection of this information began) are expected to appear because of funding through non-standard contracts. Other information recorded includes census and geographical information provided by Statistics New Zealand. The data, though, principally comes from the Health Payments, Agreements, and Compliance (HealthPAC) maternity claims system and so is concerned with payment for a service rather than actual clinical treatment. MNIS is updated monthly from the HealthPAC system. As all information is anonymised there are no issues regarding privacy.

The MNIS is accompanied by an extensive data dictionary to facilitate the coding of events and other data for entry onto the system. Within this dictionary ethnicity is defined as "*A social group whose members have one or more of the following four characteristics:*

- *they share a sense of common origins*
- *they claim a common and distinctive history and destiny*

- *they possess one or more dimensions of collective cultural individuality*
- *they feel a sense of unique collective solidarity*".

It also states that ethnicity should be self-identified. Numeric codes are listed against 22 possibilities for categorisation. It is unclear how many ethnic groups the system will accept for self-identification of a patient of multiple ethnicities. The definition of epidural analgesia is simply a yes/no indication of whether an epidural anaesthetic was used, and the information is again collected from HealthPAC.

Access to MNIS data is restricted but once approval is obtained from the MNIS Advisory Group it is possible to create customised datasets, and the NZHIS Analytical Service is available to assist with refining the specifications of the request. It also offers a peer review service which ensures that other organisations report data appropriately. The MNIS collection is the primary source of data for the MoH annual Report on Maternity.

The MoH Report on Maternity presents information on birth procedures. Data is shown in tables that present events such as epidurals as "numbers for mothers during delivery" and as "rate per 100 deliveries for mothers during delivery". The information is tabulated by DHB region and then by age and ethnicity, and needs to be interpreted with some caution. In those DHBs with a comparatively small population base, a small change in numbers over time would be reflected as a large increase in rate when looked at alongside a comparable rise in numbers within a DHB with a larger population base.

Data is not presented in such a way as to make it possible to establish any relationship between region and ethnicity, and the relationship between age and ethnicity as evidenced by the higher rates amongst the under-18s and the lower rate amongst the over-35s is not explained. It would be useful to present age-adjusted ethnic data for the provision of epidurals**.** Epidural procedures for elective caesarean deliveries are excluded and analysis of the information is limited to broad observations such as "There are ethnic differences in the usage of epidurals … The rate of epidurals also increases with age …".

The Report on Maternity generated from MNIS data does not presently make feasible the further analysis of the disparity between Māori and non-Māori with respect to the provision of epidural analgesia in childbirth. This disparity needs to be examined within the context of other confounding factors, many of which have been observed as confounders by the authors of some of the studies previously reviewed. The most significant factors to examine with epidurals and ethnicity are probably maternal age, socioeconomic status (and with that, education and rurality), parity, and LMC (and with that, the impact of patient access and patient choice). All have been demonstrated to exert a strong influence over whether or not a woman will receive an epidural.

The variation in epidural service between the DHBs implies that systemic factors also come into play. These need to be investigated, teased out, and the results presented alongside the patient data. In order to form a clear picture of how the disparity is operating we need to be able to analyse the effect of institutional policies, service availability (and with that, staffing pressures and financial considerations such as the impact of obstetric funding on obstetric disparities), and the predominant socioeconomic status and ethnic status of the patient base serviced by secondary and tertiary health providers at a national level.

Within the CCDHB, maternal and neonatal information is routinely collected and recorded on the Perinatal Information Management System (PIMS) database when new mothers are discharged from the Women's Health Service. The collected data is made up of demographic, maternal and obstetric history, early pregnancy, antenatal, birth, infant, and postnatal information. Individual patients can be identified by their NHI number. The database is contributed to by doctors, midwives, and clerical staff: Clerical staff enter the booking information (demographic, maternal and obstetric history, and early pregnancy) following the first antenatal visit, and all other information is recorded by the LMC or hospital staff at the time of the event. The data quality is monitored daily by clerical staff who compare PIMS to a manual record of important patient information, and monthly by the Information

Systems Supervisor who reviews the important data fields. Data is extracted from PIMS by Microsoft Access in order to compile the CCDHB annual Maternity and Gynaecology Report.

Microsoft Access facilitates the presentation of PIMS information by topics of interest to the service provider. Presently the report presents various ethnic data within tables that allow it to be examined by distribution between Wellington and Kenepuru, LMC, maternal age and parity, as well as other events of interest which go beyond the scope of this study. However, as noted in the literature review, obstetric anaesthetic data is only presented by birth event and anaesthetic procedure and it is not possible to infer anything else. Furthermore, obstetric anaesthetic information is entered directly onto Microsoft Access and is not included in the PIMS database. Nor is it possible to interface the anaesthetic data on Access with the Access obstetric data that was derived from PIMS. Therefore PIMS (with Microsoft Access), along with such comparable databases as exist within the other 20 DHBs does not presently appear to be suitable for the progression of an understanding of the disparity that exists between ethnicity and epidural analgesia. A more detailed analysis of the relationship between PIMS and Microsoft Access is required.

Discussions with key informants

Key informants were identified as being obstetricians, anaesthetists, and midwives. Informal semi-structured discussions were held with 2 ‘representatives’ from each discipline working within the CCDHB. As the purpose of this study has not been to provide answers as to why disparities exist in the provision of epidural analgesia, but rather to stimulate further thought and discussion, and to assess the feasibility of a larger study that could offer explanations, these discussions were designed to better facilitate our understanding of issues from providers' perspectives. Therefore it was felt that 2 clinicians from each provider group would be sufficient for the purposes of eliciting observations and opinions of epidural analgesia in childbirth, disparities in care, and the recording and reporting of data. We have not sought from these clinicians any explanations or other information that could be generalisable. Through the discussions, a range of views were identified which are briefly summarised in the following paragraphs.

The discussions revealed several sources of data concerning the use of epidural analgesia and, in most cases, maternal ethnicity. Some were unique to the specialisation recording the data, and others were in more general use. Obstetricians and midwives record childbirth data in the Perinatal Information Management System (PIMS) within the delivery suite immediately following the birth: patient identification details and demographic information having already been entered from the hospital booking form by administrative staff. Management of obstetric data using this system is a comparatively recent development, having only been available since 2000, but it is felt that it will allow the easy discernment of obstetric trends. In addition to PIMS midwives record obstetric data, including pain relief, on the relevant page of a pad of forms that are completed as the ante- and post-natal periods unfold, and which is provided for each woman under midwife care. The midwife retains a file copy, and the woman receives a copy. In the case of women under midwife care who deliver in hospital, this record exists in addition to the hospital patient record and drug chart. Midwives working within broader health provider organisations such as community health centres are also able to record obstetric data on that organisation’s system alongside the woman’s general medical history.

In Wellington Public Hospital the anaesthetists maintain a separate stand-alone Microsoft Access database for their own statistical purposes. It is anonymous and they have made the deliberate choice to prevent it from being interfaced with PIMS in order to avoid privacy issues that would stifle their use of it without adding any benefit. As such, patient identifiers and demographic information such as ethnicity are excluded. This database records details of the epidural procedure, including the reason for its administration (straight pain relief vs. a medical reason such as maternal high blood pressure, or cardiac or respiratory problems), drug used and dosage, and details of any complications. If the mother has not been discharged home within 24 hours the anaesthetists conduct a follow-up consultation and also record those details on the Access database.

Some issues were raised about the completeness and quality of data. Those providers who use PIMS observed that as some data was entered in the middle of the night by tired staff there was always the chance for errors to be made or for a fatigued clinician to be less pedantic about accurately recording information than might otherwise be the case. Therefore it was felt that data entry has to be quick and effortless, but that making it so can introduce another weakness: the trade-off between a complete record and a record of the important data or events. The key informants believe, though, that those who collect and enter the data generally do a good job. The usefulness of PIMS to further analysis is also limited by the recording of epidural analgesia as 'Yes/No', with no distinctions drawn between the various methods of achieving a regional block: all may be recorded as "epidural" which could give an inaccurate impression.

When asked for their observations on the provision of epidural analgesia in childbirth, the key informant's comments showed some consistency with the results of earlier studies. It was generally felt that the rate of epidurals had risen significantly over the last 10 years as more women were becoming aware of the service, and as more women were choosing to avoid or limit the pain of childbirth. An anaesthetist said that more women are becoming aware of low-dose epidurals that will enable them to maintain their mobility, and that they know that these epidurals do not increase the chance of a caesarean section. One obstetrician estimated the current epidural rate in Wellington to be about 48% of all vaginal deliveries.

The key informants were agreed that pain management is a joint decision between a woman and her care-givers, but that there are occasions when provision of an epidural is the most prudent course of action, and when this becomes apparent the woman is fully informed. One anaesthetist said that about ⅔ of epidurals were requested for pain relief and that about ⅓ were prescribed for a medically indicated reason. Epidural analgesia may also be administered if a woman is having a difficult birth which is distressing either herself or her baby, or it becomes apparent during the labour to the attending obstetrician that a vaginal birth is unlikely to proceed further and that a caesarean section will become necessary. Obstetricians have observed that the women who are most likely to request an epidural for pain relief are, as they described them, well informed, tertiary educated, upper decile Pākehā women who have enjoyed employment in a position of some status and who are now having their first baby in their early thirties. Women who satisfy this demographic are also more likely to reject epidural intervention and choose to give birth without the use of drugs. This would in some measure account for the paradox of a rise in epidural use being matched by a rise in natural births as observed by midwives. At the other end of the age spectrum are the teenage mothers under the age of 18 years who are also a high user group. An obstetrician key informant held the opinion that these young women tend to show a greater tendency to be fearful of the birth process, which leads to increased request for epidural analgesia over other age groups.

Choice of Lead Maternity Carer (LMC), and access issues surrounding that, is an important consideration. The key informants felt that women who have an obstetrician as their LMC are more likely to receive epidural analgesia than women who have a midwife as their LMC. If the woman giving birth does not request epidural pain relief, the obstetrician is more likely to suggest it than the midwife, who is more likely to encourage the woman to believe that she can complete the birth without such intervention.

A significant determinant of whether a woman will receive epidural analgesia was noted as being the availability of the service. In some regions there is a paucity of anaesthetists either qualified to provide the service unsupervised, or who are willing to provide the service. In such regions the provision of an anaesthetic service for surgery will clearly take precedence over an epidural service which is exclusively for pain management in childbirth. One midwife did point out that in this situation a woman may have her baby in a neighbouring DHB if it is well provided for. This would give that well-serviced DHB an impression of a higher 'local' rate of delivery of epidurals, as a percentage of them had been provided for women who do not normally reside within that DHB. In other regions where there are no availability issues the delivery of the service is considerably higher, but some

women accessing the service will be doing so privately. In one DHB, for instance, there is good private anaesthetic coverage that offers an obstetric epidural service.

Midwives suggested that in rural areas the receipt of epidural analgesia can also be influenced by the distance from home to the hospital. The further away the woman is from the hospital when she begins labour, the longer it will take for her to get there. This may result in a shorter time in hospital whilst in labour compared to urban women and therefore comparatively less time/opportunity in which to receive epidural analgesia.

Within the CCDHB region only Wellington Public Hospital offers an epidural service. The other hospital within the DHB, Kenepuru, which is about 15km north of Wellington, does not provide an epidural service. Women who live nearest to Kenepuru may elect to have their baby in Wellington because they want to be able to access an epidural. Kenepuru's hinterland has a comparatively large Māori and Pacific Island population. According to the key informants, though, most of the women electing to go to Wellington are Pākehā.

In Auckland, Middlemore Hospital has the second busiest delivery unit in New Zealand. It services a large Māori and Pacific population as well as a large generally socially disadvantaged population; and has an epidural rate of just 15%. This is consistent with international observations of less interventional childbirth in more deprived regions.

Discussion of feasibility

Now that disparities between Māori and non-Māori have been identified in the delivery of epidural analgesia we have a moral responsibility to investigate the causes of them. We do not know if Māori women are receiving a lesser service, or non-Māori women are excessively receiving epidurals, or if it is an issue of service availability combined with population densities – or a combination of all three possibilities. In any event, where a disparity is shown to exist we have a responsibility to eliminate it. To maintain the status quo would be unethical. To achieve this end it will be necessary to conduct a large-scale national study into the provision of epidural analgesia in childbirth and how this is influenced by patient ethnicity. Before embarking on such a process it is first necessary to assess the feasibility of doing so, thereby identifying potential problems and shortcomings that could hinder meaningful analysis, and the strengths and weaknesses of earlier international studies.

The international literature has predominantly examined the effects of healthcare disparities on the largest groups that are not part of the dominant culture, rather than examining the effects of healthcare disparities on indigenous cultures. Many of the findings are generalisable to New Zealand, though, as many of the factors that were identified as influences were also independently identified by local obstetric service providers, as well as being repeated in a limited way within the MoH reports that were consulted. Factors such as socioeconomic status, maternal education and age, and parity are all important determinants which are influenced by ethnicity and which impact on whether a woman will receive epidural analgesia: as is the ability of clinical staff of ethnicities different to that of the woman in childbirth to accurately assess her level of pain. This has been demonstrated to exist in other clinical settings besides obstetrics and is a significant obstacle to the provision of appropriate care. One important strategy to reduce its impact is to recruit and retain more clinical staff from cultures other than the dominant culture, and that has started to happen here in Aotearoa, New Zealand.

The point of difference between these studies and the New Zealand situation is the potential difference in expectations of indigenous peoples, against those of other disadvantaged groups, with respect to healthcare delivery, and the impact of the tension between expectation and service delivery which is felt within these groups. Allied to this are the attitudes that women of different ethnicities may have towards the birth process and how these inform the choices that they make.

Choice can be a luxury. Many Māori women may have limited choice with respect to how they will have their babies when compared to many non-Māori women. The issue for Māori may be one of access to the service. As an obstetrician remarked, Māori women may be missing out on receiving epidural analgesia because they don't know that it's available or because they don't know how to access it. Either scenario, if accurate, is entirely unacceptable. The clinical staff caring for these women ought to be explaining to them all of the options and enabling them to reach a fully informed decision. Any future study should include provision to interview women following the birth. Such an interview needs to focus on the mother's knowledge of her options as she went into labour and how options were reiterated or revealed during the birth process.

The statistical data gathered and reported, as described earlier in this study, is of limited use in determining the cause(s) of the apparent disparity between Māori and non-Māori in the provision of epidural pain relief in childbirth. Nationally, obstetric data appears to be principally gathered by the MoH from claims made against maternity funding rather than first-hand from patient notes and drug charts. This may impose an indirect limit on the gathering, storing, and analysis of information. The data appearing in the MoH reports is certainly of limited use for our stated purposes. The dataset that the MoH sources when it compiles these reports may contain more information than the Ministry makes use of, and it would be advisable to engage with the MNIS Advisory Group who maintain and protect that dataset. It may be that there is sufficient relevant data, but such an investigation was beyond the scope of this study.

The MNIS dataset does not provide a clinical definition of epidural analgesia, and as such it does not help us to a better understanding of the provision of epidural pain relief in childbirth. As it does not offer even the briefest description of the procedure, there exists the possibility that any obstetric local anaesthetic procedure could be counted as an epidural whether it was an epidural or a spinal or a Combined Spinal and Epidural anaesthetic. Therefore epidural data as currently reported needs to be interpreted with a degree of caution (though in likelihood the majority of local anaesthetic procedures will be true epidurals), and has the potential to undermine any future study. 'Mixed' reporting, if it is indeed happening here, is not unique to New Zealand. At least one international study has been devalued by the practice.

In addition to the national MoH databases there are also local databases. They have been created and maintained by discreet units and as such these databases do not interface, nor do they appear independently capable of answering any questions regarding disparities. The CCDHB has PIMS for recording obstetric events, and a Microsoft Access database has been created by two Wellington anaesthetists to provide detailed obstetric anaesthetic information.

The data available and the opinions of those clinical staff who were interviewed would indicate that many maternal factors are influencing the ethnic disparity as it has been reported, principally socioeconomic status, education, age, and parity. Whether or not a woman lives in a region which is capable of providing a robust service is an important determinant, as is the woman's choice of LMC or the LMCs to which she has access. Also important is whether an epidural anaesthetic is requested for pain relief or offered in response to some other medical indication such as high blood pressure. If one group of women are receiving proportionally more epidurals for medical reasons than other groups, then they could actually be receiving proportionally fewer for straight pain relief. Data reporting at present does not allow any distinction to be made. All of these factors interact with ethnicity and it quickly becomes apparent that a multi-variate study is required.

International studies have often been hindered by small study populations. Due to the variety of studies conducted and their differing methodologies it has not been possible to conduct a meta-analysis to gain an estimate of the sample size required to give any study a power of 80%.

Past studies have also been limited by relying on data recorded by many different people in different centres. Furthermore the data was recorded for reasons other than the gathering of the research for which it was eventually put to use. These are weaknesses of any retrospective study. They can be

eliminated by designing a prospective study. This would also enable the conducting of an open-ended study with scheduled power calculations. The disadvantage is that it requires the co-operation of a large number of obstetric staff who may be unlikely to see an advantage to them in participating, which could compromise the quality of data gathering.

Given all of the above observations it may only be feasible to conduct a study into the disparity of epidural pain relief in childbirth in Aotearoa, New Zealand by liaising with obstetricians and midwives to recruit into a national study a random sample of women who have recently given birth. As homebirths vs. hospital births contributes to any debate concerning choice of and/or access to epidural pain relief such a study should not be limited to hospital births. Inpatient records should be relied upon (or midwife records in the case of homebirths) for data collection.

All women in New Zealand have a right to the same quality of obstetric care. At present this is not the reality. Māori women are receiving a safe and established obstetric intervention at a rate that is significantly lower than that of other women. We have an ethical duty to determine why.

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