Wheeler J, Davis D, Brodie PM, Fry M, Homer CSE. (2012) Is Asian ethnicity an independent risk factor for severe perineal trauma in childbirth? A systematic review of the literature. *Women and Birth* 25(3):107-13.

Abstract

Objective: to undertake a systematic review of the literature to determine whether Asian ethnicity is an independent risk factor for severe perineal trauma in childbirth.

Method: Ovid Medline, CINAHL, and Cochrane databases published in English were used to identify appropriate research articles from 2000 to 2010, using relevant terms in a variety of combinations. All articles included in this systematic review were assessed using the Critical Appraisal Skills Programme (CASP) 'making sense of evidence' tools.

Findings: Asian ethnicity does not appear to be a risk factor for severe perineal trauma for women living in Asia. In contrast, studies conducted in some Western countries have identified Asian ethnicity as a risk factor for severe perineal trauma. It is unknown why (in some situations) Asian women are more vulnerable to this birth complication. The lack of an international standard definition for the term Asian further undermines clarification of this issue. Nevertheless, there is an urgent need to explore why Asian women are reported to be significantly at risk for severe perineal trauma in some Western countries.

Conclusion: Current research on this topic is confusing and conflicting. Further research is urgently required to explore why Asian women are at risk for severe perineal trauma in some birth settings.

Keywords: Severe Perineal Trauma; Anal Sphincter Laceration, Asian, Ethnicity, Episiotomy.

Word count: 3997

Introduction

In most settings, perineal trauma is a common form of morbidity associated with childbirth. (1) The incidence of severe perineal trauma, which disrupts the anal sphincter (see Table # for definitions) was thought to be 0.6% to 9% (2) however, with the use of 3-dimensional imaging, studies in the United Kingdom (UK) and the United States of America (USA) suggest the incidence may range from 11% to 25%. (3, 4) Severe perineal trauma can have short and long term implications for quality of life and wellbeing, therefore, it is essential to attempt to minimise this adverse outcome. (1, 5-9)

In 2003-2004, in a maternity unit south west of Sydney, New South Wales (NSW), Australia, four women experienced severe perineal trauma following a vaginal birth and required colorectal surgery. In response, a 12 month retrospective audit of health care records was conducted (unpublished). This audit identified that of 2,403 vaginal births, 61(2.5%) women experienced severe perineal trauma, with 64% (n=39) experiencing a normal vaginal birth, 31% (n=19) a vacuum and 5% (n=3) forceps. Twenty five percent of these women were born in Australia, almost half were born in an Asian country and the rest were from other countries. Women born in Asian countries were over-represented in the findings. The term 'Asian' was used to define any woman born in South East Asia, China, India or Fiji. This definition was not based on any literature or classification.

Asian ethnicity has been shown to be a risk factor for severe perineal trauma in some countries, however, there is still uncertainty as to whether Asian ethnicity is an independent risk factor, or if other factors combine with Asian ethnicity to increase the likelihood of severe perineal trauma. Clearly, women's ethnicity cannot be altered, but the identification of factors related to midwifery practice that might make a difference to the incidence of this event in Asian women would be useful. This systematic review examined whether Asian ethnicity was a risk factor for severe perineal trauma, addressing the question "Is Asian ethnicity an independent risk factor for severe perineal trauma in childbirth?" A systematic review of this nature has not been conducted before.

Methods

Ovid Medline, CINAHL and Cochrane databases were used, to identify research articles published in English from 2000 to 2010, using relevant terms in a variety of combinations (Table 1). The Cochrane Library did not provide any further references with the terms "Asian, race or ethnicity" or with any combination of all the above terms entered into Medline. A hand search of current relevant journals did not find any new articles.

A total of 2,890 articles were identified. A review of article titles established that 221 articles were relevant to this systematic review. These articles were further reviewed in detail for relevancy to Asian ethnicity and risk factors for severe perineal trauma, and their reference lists were also searched for related articles, leaving a total of 15 articles for this systematic review. Articles were excluded if Asian ethnicity was not considered independently, or data on Asian ethnicity was not provided. The methodological quality of articles located using this screening process was assessed using the Critical Appraisal Skills Programme (CASP) tool. (10)

Findings

The 15 articles originated from Asia, Australia, Canada, United Kingdom (UK), and the United States of America (USA). One study used data from a randomised controlled trial (RCT) for a secondary analysis. (11) All others were either retrospective or prospective observational/ cohort studies. Categories emerged as studies were reviewed and findings are presented under these category headings.

Being of Asian origin as a risk factor for severe perineal trauma?

In the USA, Green and Soohoo (12) were among the first researchers to suggest ethnicity may increase the risk of anal sphincter laceration during vaginal birth. This retrospective study of 2,706 spontaneous vaginal births identified that women of Chinese and Filipino origin were significantly more likely to have anal sphincter lacerations than White women. Language barriers and anatomical variation (short perineal bodies) were thought to be possible reasons for these findings.

More than a decade later the influence of race or ethnicity on severity of perineal trauma was ...? described in a number of studies. For example, a USA study estimated the incidence of anal sphincter laceration and identified risk factors in more than two million vaginal births from 1992 to 1997. (13) Multiple, breech and preterm births and stillbirths were excluded. Racial or ethnic background was found to influence the severity of perineal lacerations, with women from Filipina (OR 1.63; 95% CI 1.50-1.77), Indian (OR 2.5; 95% CI 2.23-2.79) and Other Asian (OR 1.37; 95% CI 1.29-1.45) groups being more likely to sustain severe perineal trauma. Ethnicity was not differentiated within the Other Asian group even though this group made up 6.5% (129,220) of the total sample, which is significantly higher than the Indian (0.7%) and Filipina (2.3%) groups.

First vaginal birth (OR 6.40, 95% CI, 5.11-8.01), midline episiotomy (OR 6.91, 95% CI, 6.06-7.88), forceps birth (OR 4.48, 95% CI, 3.85-5.20), pudendal block (OR 5.63, 95% CI, 4.72-6.41) and birth weight of more than 4000 grams (OR 2.35, 95% CI, 1.91-2.89) were risk factors for severe perineal trauma in a retrospective cohort study conducted in the USA. (14) The severe perineal tear rate was 8.2% (n=1,905) from a sample of 23,244 women experiencing a vaginal birth in one hospital from 1993 to 1998. Asian women (3.4% n=65) were found to be at increased risk for a severe perineal tear (OR 1.75, 95% CI, 1.27-2.41) and experienced more episiotomies (36.9% versus 24.6%). The majority of birth attendants were junior medical officers and the effect of clinicians during labour and birth is suggested as possibly influencing the severity of perineal trauma.

Goldberg, et al. (15) in the USA, examined the association between maternal race, the incidence of 3rd and 4th degree perineal tears and the overall rate of perineal trauma in one hospital. A retrospective study of 34,048 vaginal births from 1983 to 2000 identified that 10% resulted in a third or fourth degree perineal tear. There were 833 Asian women in this group, confirming that Asian race was an independent risk factor for 3rd or 4th degree perineal tears (OR 2.04; 95% CI 1.43-2.92) compared with White race, whereas Black race (OR 0.42; 95% CI 0.35-0.52) was protective. Asian women were found to be particularly at risk for anal sphincter injury if they experienced an instrumental birth and

an episiotomy. The Asian group was described as being mainly Chinese, although women representing other ethnicities were included for example, women with Laotian and Vietnamese origins.

Hopkins, et al. (16) attempted to determine whether ethnicity could enable clinicians to adapt their clinical practice techniques to minimise perineal trauma. They undertook a retrospective study to identify variations in ethnicity in perineal, vaginal and cervical tears following vaginal birth in nulliparous women. Data were extracted from a database at the University of California, USA, from 1976 to 2001, and from a sample of 17,216 births, it was identified that 2,645 (15.4%) women experienced a 3rd or 4th degree tear. Other Asian (19.3%), Chinese (23.3%) and Filipino (21.9%) groups had the highest number of 3rd and 4th degree tears. The Other Asian group included South East Asian, Indian and Pacific Islander women.

Similarly, in the USA, a retrospective cohort study identified significant differences in pregnancy and birth outcomes between Latina (51%), Black (7%), Asian (6.9%) and White non-Latina (35%) ethnic groups. (17) Data from 1997 to 1998 were extracted from a state database and 93% of 1,426,854 births were categorised by selected ethnic groups. Reduced incidence of severe perineal laceration, postpartum haemorrhage and major puerperal infection were seen as markers of good intrapartum care by the authors. Asian women were significantly more likely to experience an increase in all three markers including severe perineal lacerations (OR=1.32; 95% CO=1.29-1.35). Therefore, the most likely association with these adverse outcomes is that Asian women receive inadequate intrapartum care.

Modifiable risk factors, clinical practice and Asian ethnicity

A number of studies have considered modifiable risk factors and clinical practice. For example, a retrospective observational cohort study of all singleton vaginal births at one hospital in the USA, examined the effects of modifiable risk factors on severe perineal trauma from 1996 to 2006. (18) In total, 46,239 women met the inclusion criteria, with 2.9% experiencing severe perineal trauma. Risk

factors associated with severe perineal trauma were nulliparity, instrumental birth, maternal age, birth weight and ethnicity. The incidence of severe perineal trauma between ethnic groups varied dramatically – yet again, women of Asian ethnicity experienced the highest rate of severe perineal trauma at 11.4%, compared with Black (2.5%) and White ethnicities (4.1%). The overall incidence of severe perineal trauma reduced from 5.4% in 1996, to 1.3% in 2006. Clinical practice changed significantly during this time, with modifiable risk factors for severe perineal trauma being an increasing caesarean section rate and reduction in forceps and episiotomy.

The above results support the findings of an earlier retrospective study by Kudish, et al. (19) that included 33,842 women. The study described individual variation in clinical practice between clinicians and the use of modifiable risk factors (midline episiotomy and instrumental birth) for severe perineal trauma at one hospital in Canada, from 1996 to 2003. The effect of these practices on the incidence of severe perineal trauma was examined for all women experiencing a singleton, vertex vaginal birth. All births were conducted by a medical officer. Instrumental birth and midline episiotomy (individually and combined) significantly increased the risk of severe perineal trauma for all women. Asian women experienced the highest rate of severe perineal trauma at 21.7%, followed by white women (12.2%) and Black women (6.6%), although the sample size for the Asian group was small (n=122 no severe trauma, n=34 severe trauma).

In Australia, a secondary analysis of data from an RCT focused on perineal outcomes following vaginal birth for primiparous women from Asian and non-Asian backgrounds. (11, 20) Data were collected from 1997 to 2004 in two maternity units in NSW. All women were cared for by midwives during childbirth. One third of this sample were classified as Asian and Asian women were found to experience significantly more 3rd or 4th degree perineal tears (11% vs. 4.5%, OR 2.6, 95% CI 1.4-4.7) and episiotomies (18% vs. 8%, OR 2.4, 95% CI 1.5-0.38) compared with non-Asian women. Fear and a lack of ability to communicate were areas highlighted as requiring further exploration.

Defining ethnicity in determining associations

Definition of ethnicity is challenging in many of the studies, which means accurate correlation with trauma is difficult to determine. Individual ethnicity was self reported by participants in some studies (12, 15, 16) whereas, in others it is not clear how race or ethnicity data were obtained. (13, 14, 18, 19) No definition of the terms race, ethnicity or specific groups such as, Asian were provided.

Other research conducted in Australia considered the issue of ethnic origin. A two year prospective cohort study of all vaginal births (1998 to 2000) occurred at a NSW hospital, with the objective of identifying risk factors for 3rd and 4th degree tears. (21) In total, 6,595 women were included and a 2% (n=134) severe perineal trauma rate over two years was shown, with 91% (n=122) of these women having 3rd degree tears and 9% (n=12) 4th degree tears. Severe perineal trauma was found to occur more often if women were Asian, had no health insurance and when interpreters were needed. The majority (81%) of women were having their first baby (OR 4.6; 95% CI 2.9-7.2). Severe perineal trauma was experienced by nearly twice as many Asian than non-Asian women (OR 1.9: 95% CI 1.3-2.8). It was felt that Asian women had a tendency towards shorter perineums, which can become oedematous and rigid thereby, increasing the risk of perineal trauma. The term 'Asian' was categorised as the woman's country of birth. However, categorising Asian women by country of birth is a limitation of the study, with individual ethnic background being potentially misrepresented, for example, ethnicity could be Chinese, and country of birth could be Australia.

In a USA retrospective cohort study foreign-born women were found to be at increased risk of experiencing perineal trauma (RR 1.72,95% CI 1.66-1.75) and an episiotomy (RR 1.32, 95% CI 1.26-1.39). (22) Asian (RR 26.9, 95% CI 1.78-4.08) and African women experienced more 4th degree tears. Out of a total of 49,904 (USA-born women 73% n=36,439), foreign-born women (27% n=13,465) came from 164 different countries, with only 2% (n=829) identifying themselves as Asian. The majority of women born in what was considered an Asian country chose the 'Other' ethnic classification rather than 'Asian', which highlights the importance of sub-group classifications. Possible effects of poor communication or unrecognised culturally specific needs were mentioned.

Research in Asian countries

Research in Asian countries is important to explore as it has been suggested that outcomes are only poorer for these women when they live and give birth in non-Asian countries. Potential risk factors and incidence of severe perineal trauma were investigated in 7,946 Japanese women experiencing a vaginal birth in two hospitals in Japan, from 1997 to 2004. (23) A severe perineal tear occurred in 1.7% (n=135) of women. Risk factors for severe perineal trauma were found to be midline episiotomy (OR, 4.65; 95% CI, 2.09-11.55), first vaginal birth (OR 4.36; 95% CI, 2.17-9.57), forceps (OR, 7.11; 95% CI, 1.95-20.59), vacuum (OR, 5.93; 95% CI, 3.38-10.36), use of oxytocin (OR, 2.19; 95% CI, 1.27-3.73) and experience of birth attendant (OR, 2.88; 95% CI, 1.12-9.81). It was reported that individual clinical practice techniques might have influenced the incidence of severe perineal trauma. All births were conducted by medical officers, however, the more experienced the clinician the greater the incidence of severe perineal laceration, which could mean that the more experienced the clinician, the more complex the birth.

Asian ethnicity as a risk factor for severe perineal trauma has been described as a "myth" in response to research findings from a prospective observational study conducted in Hong Kong. (24) A policy of restrictive episiotomy was implemented and perineal length was assessed (during the first and second stage of labour and at crowning) in 429 Chinese women experiencing a normal vaginal birth at term. Midwives performed an episiotomy only when fetal distress, maternal exhaustion or a tight perineum (to prevent a perineal tear) was identified. During this study the episiotomy rate reduced from 73% to 27%, with no subsequent increase in perineal trauma. Perineal length was found to be comparable with other ethnicities, which supports the findings of Dua, et al. (25) Limitations of this study were the small sample size and the low incidence of severe perineal trauma (0.3%), which prevented exploration of risk factors.

A Korean retrospective study investigating anal incontinence identified a 2.8% (n=16) incidence of severe perineal trauma in a cohort of 562 Korean women experiencing a vaginal birth at one hospital. (26) Vacuum birth totalled 160 (28.5%) and eight of these women experienced severe perineal

trauma. Generalisability of the study was limited due to design and a small sample size. These results suggest that outcomes from studies examining the incidence of severe perineal trauma for Asian women, living in their Asian country of origin, appear comparable to studies examining study outcomes of the dominant population in Western countries, although studies in Asian countries are few and sample size is small. (23, 24, 26) Of concern, is that the risk of experiencing severe perineal trauma during childbirth appears to dramatically increase for Asian women when residing in some Western countries. (11, 13-16, 18, 19, 21, 27)

Other possible explanations

Explanations other than ethnicity have been proposed. A USA retrospective longitudinal study of all singleton births (excluding episiotomy, multiple and caesarean births) from 2001 to 2006, identified that an increased risk of severe perineal trauma for Chinese women may be partly due to an imbalance between maternal Body Mass Index (BMI) and birth weight of the baby (OR: 1.011; 95% CI: 1.002-1.020) - this finding is only just statistically significant. (27) These combined factors were found to be more predictive of severe perineal trauma. The BMI of Chinese women was lower than Hispanic women and yet in this study the birth weight of babies born to either ethnic group were comparable (Adj OR 1.0012: 95% CI 1.0007-1.0016). In total, 3,085 women (1,309 Hispanic and 1,528 Chinese) gave birth in one hospital, with 2,281 (74%) pre-pregnancy BMI's available. Only 41 Caucasian, 90 Asian (non-Chinese) and 117 African American women were in this cohort. Chinese ethnicity was a significant risk factor for severe perineal trauma compared with Hispanic ethnicity (9% versus 2.8%) (OR: 2.88; 95% CI: 1.92 - 4.30). BMI:birth weight ratio does not fully explain why Chinese women are significantly more at risk for severe perineal trauma. Anatomical, social or cultural factors are suggested as being potential causes although, it is noted that the discipline or influence of the birth attendants are not mentioned and ability to effectively communicate is also not considered.

Possible anatomical explanations

Dua, Whitworth, Dugdale and Hill (25) recognised a lack of standardised data for perineal length during labour and as a result, a prospective observational study was conducted at a hospital in the UK,

from 2005 to 2007. The aim was to establish a standardised range for perineal length during the first stage of labour and show the relationship between perineal length and perineal tears in Caucasian and Asian women. In total, 1,000 women were recruited, with the main ethnic origins being classified as White 73.4% (n=734) or Asian/ Asian-British 25% (n=250). The length of the woman's perineum was measured by a midwife during the first stage of labour. Participant ethnic classification was based on UK national standards. (28) There was a significant risk of a 3rd degree tear in women with a short perineum having their first vaginal birth (p=0.03). No significant difference was found in the mean perineal length between Asian (3.6±0.9 cm) and Caucasian (3.7±0.9 cm) (p= 0.06; 95% CI - 01 to 0.26) women and no association was identified between maternal BMI, height, weight or perineal length related to the extent of perineal trauma. Third degree tears occurred in 2.5% (n=25) of women (5 Asian, 20 Caucasian), with no increased risk attributed to either group. The authors concluded that Asian and Caucasian ethnicity did not affect the severity of perineal trauma, which conflicts with USA and Australian studies, but supports findings in some Asian studies. However, classification of the term 'Asian' applied in this UK study differs from that used in other countries. The authors concluded that Asian and Caucasian ethnicity does not affect the severity of perineal trauma, which conflicts with USA and Australian studies, but supports findings in some Asian studies. However, classification of the term 'Asian' applied in this UK study differs from that used in other countries.

Discussion

The majority of the studies in this systematic review were conducted in Western countries and describe Asian ethnicity as a significant risk factor for severe perineal trauma during childbirth. (11, 13-16, 18, 19, 21) There was an overall severe perineal trauma rate of 2% - 15.4% for women of all ethnicities, with women from an Asian background being significantly more likely to sustain this injury. However, one UK study found no difference in trauma rates for women with an Asian or Caucasian background. (25) Asian ethnicity as a risk factor for severe perineal trauma has also been described as a "myth" (24), with studies conducted in Asian countries (Japan, China and Korea) having a severe perineal trauma rate of between 0.3% to 2.8%, which is at least comparable or lower than in Western countries. (23, 24, 26)

It has been suggested that Asian women may have a shorter perineum compared with other ethnic groups and research has confirmed the shorter the perineum, the more chance of severe perineal trauma. (12, 21, 25) However, no significant differences have been found between Asian or Caucasian women in perineal length or incidence of perineal trauma in reviewed Asian and UK studies, in contrast to research in other Western countries. (23-26)

Defining the term Asian

Dua, et al. classifies ethnic groups based on the UK Ethnic Group, National Statistics Classification. (25, 28) The terms Asian or Asian British refer to the following ethnic groups: Indian, Pakistani, Bangladeshi and Any other Asian background, whereas in the USA, the term Asian refers to women with an ethnicity related to South East Asia, the Far East or the Indian Subcontinent. (29) Australian standards for defining ethnic groups are more in line with the USA classifications, although they tend to be more specific for example, women with a South East Asian background can be further delineated into Mainland South-East Asian and Maritime South-East Asian, which is further broken down into specific ethnic groups such as**,** Vietnamese and Lao or Filipino and Javanese. (30) Combining ethnic groups compromises compatibility and increases the risk of bias in research. (30, 31) Moreover, differences in ethnic group classification between the UK, USA and Australia reduces the generalisability of studies between these countries and does not support clarification of Asian ethnicity as a risk factor for severe perineal trauma in childbirth. Nonetheless, the myriad of definitions used to describe the term 'Asian' globally, should be taken into consideration when reviewing the literature.

Hidden factors?

Research has identified known modifiable and unmodifiable risk factors for severe perineal trauma during childbirth. (18, 32) Ethnicity has been found to influence the incidence and severity of perineal trauma during childbirth, with some ethnicities being protective, whereas others have an increased risk for this complication. (11, 13, 15, 16, 18, 19, 27) However, it is recognised that unknown factors continue to impact on the incidence of severe perineal trauma specifically for Asian women in

Western countries. (11, 12, 14, 18, 19, 21, 27) Some studies continue to ponder on what these unknown or "hidden" risk factors might be that create such physical vulnerabilities in Asian women. Suggestions have been made that these unknown factors may be related to labour and birthing management techniques, ethnic anatomical differences, communication, cultural differences, aculturisation, fear or influence of the birth attendant. (11, 12, 14, 18, 19, 21, 23, 27) These factors are occurring within the birthing room setting and it is suggested that the influence and approach taken by the birth attendant caring for the labouring and birthing woman is relatively unknown, particularly when attempting to minimise perineal trauma for Asian women during labour and birth. The reviewed studies have no direct observational data of what is actually occurring within the birthing room. Studies usually rely on the birth attendant filling in a data collection form and/or the data is entered into a computer database following the birth.

Current research on this topic is confusing and conflicting, and does not provide a definitive answer as to why Asian women have a significant risk factor for severe perineal trauma in some Western countries. It is suggested that further research is required to explore why Asian women are significantly at risk for severe perineal trauma in the birth setting.

Conclusion

In summary, Asian ethnicity in some Western countries has been identified as a significant risk factor for severe perineal trauma during vaginal birth. However, in contrast to these findings, Asian women living in an Asian country do not appear to be significantly at risk for severe perineal trauma. Potential factors within the birthing room setting may be influencing the severity of perineal trauma. Additionally, the lack of an international definition for Asian ethnicity undermines generalisability of research results. Nevertheless, there is an urgent need for research to step into the domain of the Asian women and birth attendant to explore why some Asian women are significantly at risk for severe perineal trauma in the birthing room setting.

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