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Gestational diabetes mellitus among women born in South East Asia: A review of the evidence

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ABSTRACT

Objective: the aim of this paper was to examine rates of gestational diabetes mellitus (GDM) among women born in South East Asia, now residing in a developed country
Data sources: established health databases including: SCOPUS, MEDLINE, CINAHL, EMBASE and Maternity and Infant Care were searched for journal papers, published 2001–2011.
Study selection: studies that examined GDM among women born in South East Asia (SEA) were sought. Keywords included gestational diabetes and a search term for Asian ethnicity (Asian, Asia, race, ethnic, and ethnicity). Further searches were based on citations and references found in located articles. Of 53 retrieved publications, five met inclusion criteria.
Data extraction: data were extracted and organised under the following headings: GDM rates among women born in SEA; screening for GDM; and characteristics of GDM risk for SEA born women. Study quality was assessed by using the CASP (Critical Appraisal Skills Programme) guidelines.
Data synthesis: this review produced three main findings: (1) compared to combined Asian groups, GDM rates were lower among SEA women; (2) compared to other Asian sub-groups, GDM rates among SEA women were in the intermediate range; and (3) SEA born women demonstrated consistently higher rates of GDM than women from the same ethnic background who were born in countries such as the US, UK or Australia.
Conclusions: from this review, it was clear that a 'one size fits all' approach to Asian ethnicity was not useful for estimating GDM rates among SEA women. There was also considerable difference among women of SEA ethnicity born in South East Asia, compared to women of the same ethnic background born in developed countries. Future research should explore the unique characteristics of GDM risk for these women. Such information is necessary for the development of strategies for the prevention and treatment of GDM among SEA women.

Introduction

Gestational diabetes mellitus (GDM) refers to diabetes that is first diagnosed in pregnancy. It affects approximately 3–8% of women in developed countries (Ferrara et al., 2002; Joshy and Simmons, 2006; Templeton and Pieris-Caldwell, 2008; Martin et al., 2010) and there is now considerable evidence to suggest that rates are strongly related to demographic characteristics such as ethnicity (Dornhorst et al.,1992; Cheung et al., 2001; Ferrara et al., 2002), older maternal age (Cheung et al., 2001) and obesity (Cheung et al., 2001; Ben Haroush et al., 2006). Additionally, GDM rates have increased rapidly in the past two decades, particularly in developed countries such as Australia and the US (Cheung and Blyth, 2003; Joshy and Simmons, 2006; Metzger, 2006). Much of this increase relates to greater ethnic diversity and rising rates of obesity in the population (Ferrara et al., 2004). Although GDM is usually temporary and disappears after pregnancy, it is nonetheless associated with significant maternal and infant morbidity, including maternal hypertension, caesarean section, macrosomia (birth weight >4.0 kg), neonatal special care admission, stillbirth (Langer et al., 2005) and childhood obesity (Lawlor, 2011). Women with GDM in a previous pregnancy, also incur a 7–12 times greater lifetime risk for developing type 2 diabetes (Bellamy et al., 2009). Because of these risks, GDM is a significant concern for health professionals, including midwives, nurses, and doctors.

Non-Caucasian ethnicity is clearly linked to higher rates of GDM (Dabelea et al., 2005; Joshy and Simmons, 2006; Ferrara, 2007; Martin et al., 2010) and this is especially the case for Asian ethnicity (Cheung et al., 2001; Dabelea et al., 2005; Martin et al., 2010). Rates are generally reported in the region of 8–15% for Asian groups compared to approximately 4–7% for Caucasian women (Ferrara et al., 2004; Hunsberger et al., 2010; Rosenberg

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et al., 2005). Additionally, poorer infant outcomes, such as preterm birth and macrosomia (Rao et al., 2006a), recurrence of GDM in subsequent pregnancies (Kim et al., 2007), and later development of type 2 diabetes (Cho et al., 2006), are all seen with greater frequency among Asian women with GDM.

Although the link between Asian ethnicity and gestational diabetes is well established, it remains very difficult to extract data relating to GDM rates among specific Asian sub-groups such as women born in South East Asia. This is because most studies report on individuals of Asian origin in a single group, irrespective of region or country of birth (Ferrara et al., 2004). Thus, the term Asian may equally refer to individuals from different world regions, such as the South Asia (Indian subcontinent), Central Asia (including Afghanistan), North Asia (including China and Mongolia) and South East Asia (including Vietnam, Malaysia, and Philippines). These areas are very different in terms of ethnicity, culture and dietary background (Hunsberger et al., 2010), which makes the combination of results problematic. Other studies combine Asian and Pacific Islander women into a single category (Baraban et al., 2008; Hunsberger et al., 2010), although these populations are also very different in key characteristics such as genetic composition and rates of obesity. To further add to this conundrum, women born in Asian countries may be considered together with women, of the same ethnicity born in developed countries, despite major differences between these groups (Kieffer et al., 1999). Such variation contributes to confusion and a lack of information about GDM in specific Asian sub-groups, such as women born in South East Asia, which is the group of interest for this review.

For the purpose of this review, South East Asia is defined as ASEAN (Association of South East Asian Nations) member states, including: Brunei, Burma (Myanmar), Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam (ASEAN, Association of South East Asian Nations, 1967). South East Asia is an impoverished area with a long history of migration to developed countries such as Australia and the US, and to a lesser extent, to the UK (Martin et al., 2006). In Australia, for example, migrants from SEA countries accounted for 12.9% of all migrants in 2000–2001 and this figure increased to 14% in 2010–2011(Australian Government Department of immigration and Citizenship, 2012). Similarly, high numbers also migrate to the US, and in the 2011 US census report, SEA countries, Vietnam and Philippines were among the nine most common countries of birth recorded for foreign born US residents (US Census Bureau, 2010; Walters and Trevalyan, 2011). In the UK, migrants from SEA countries are not quite so numerous; however, SEA countries, Vietnam, Malaysia, and Thailand are included among the 60 most common countries of birth recorded for British residents (Office for National Statistics, UK, 2011). This finding has real implications for pregnancy care as increasing rates of migration from South East Asia means that women from this area, present with greater frequency for pregnancy care in developed countries (Anna et al., 2008; Davey et al., 2008; Kornosky et al., 2008). At the same time, considerable anecdotal evidence indicates that SEA born women are at high risk of GDM. For both these reasons, it is important to establish independently the risks of GDM for this Asian sub group. At present, there is limited information about GDM, in this group, to guide health-care professionals new to their care. This review therefore examined rates of GDM among women born in South East Asia and now presenting for pregnancy care in developed countries, such as Australia, the US and UK.

Methods

A computerised database search was conducted of established health databases, including: SCOPUS, MEDLINE, CINAHL, EMBASE and *Maternity and Infant Care*. The review was conducted in January 2011 and search parameters included publications within the previous 10 years (2000–2010). Quantitative studies were targeted if they included *gestational diabetes* and a search term for Asian ethnicity (*Asian, Asia, race, ethnic, ethnicity*), in the abstract. The results of the searches were managed in an Endnote library (Endnote 2, version 14). This exercise produced 53 abstracts of interest (step 1). Hand searches, based on citations and references of already retrieved articles, yielded an additional 3 articles ($n=56$) (step 2). Initial screening involved the exclusion of duplicates ($n=13$) (step 3). Thereafter, abstracts were excluded on the following basis (step 4):

- editorials, letters, opinion pieces, reviews;
- not written in English;
- focussed on diabetes types 1 and 2;
- focussed on GDM predictors such as obesity; and
- ethnicity other than Asian.

A total of 11 abstracts remained after this process (see Fig. 1, Table 1) and these full papers were obtained, and screened for fit with the review's intent (step 5). Quality assessment and data extraction were independently undertaken by two researchers. Differences in assessment were resolved by discussion until agreement was reached. Both researchers double-checked papers for accuracy and completeness.

At this stage, papers were excluded if they did not include South East Asian ethnicity or a minimum of one of the associated countries (Brunei, Burma (Myanmar), Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam) as discrete categories. After this process, seven papers remained and these papers were examined closely. Two additional papers were excluded at this stage as it was unclear if subjects had been born in South East Asia or the US (Rao et al., 2006b; Pedula et al., 2009). A total of five papers were included in the review (Stone et al., 2002; Savitz et al., 2008; Chu et al., 2009; Cripe et al., 2010; Hedderson et al., 2010).

Quality assessment of included studies

Quality assessment of included studies was undertaken using the Critical Appraisal Skills Programme (CASP) guidelines for appraising quantitative studies (CSP, 2003, 2004, 2005). CASP guidelines ask three primary questions of a paper: (1) Is it trustworthy? (2) How important are the results? (3) How relevant is the paper? (Milne and Oliver, 1996). To date, CASP appraisal tools have been used in a variety of health areas including nursing, medical and maternity services (Luker et al., in press; Milne and Oliver, 1996). In this review, CASP guidelines were used to assess studies for the following features: clear focus, appropriate method, appropriate recruitment strategies, possible bias, confounding factors, believable results, and fit with available evidence (see Box 1). CASP questions 7 and 11 were excluded as Q.7 relates to follow up, a feature that is not compatible with the cross sectional method used by reviewed studies, and Q11 refers to the applicability of results for the local population. This feature was considered redundant as inter-country differences in GDM screening, health-care systems and population composition were judged likely to impact on the level of correspondence of findings with the local population. Ethnicity was assessed with Q.4 and GDM screening was assessed with Q.5. Each characteristic was scored 1 for present and 0 for absent with the exception of Q.6, which was allocated a score of 1 for each question, a total of 2. A final question (Q.13) was included to estimate external validity, based on the work of Downs and Black (1998). The total range of possible scores was 0–12, with 12 indicating the highest possible quality.