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Attitudes towards gestational diabetes among a multiethnic cohort in Australia

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Attitudes towards Gestational Diabetes among a multi-ethnic cohort in Australia.

Introduction

The standard definition of Gestational Diabetes Mellitus (GDM) is 'carbohydrate intolerance with onset or first recognition during pregnancy' (Hoffman et al., 1998, p.93), or diabetes that is first diagnosed in pregnancy. Although generally transient, GDM has serious health implications, including adverse outcomes, for mothers and babies (Crowther et al., 2005, Fan et al., 2006, Langer et al., 2005). Adverse outcomes include increased rates of maternal hypertension, preterm labour, macrosomia (birth weight in excess of 4,000 gr), low birthweight and stillbirth (Crowther et al., 2005, Fan et al., 2006, Langer et al., 2005). This is of concern particularly as, in the last two decades, GDM incidence has been steadily increasing in developed countries, such as the United States, United Kingdom, Australia and New Zealand (Ferrara et al., 2004, Joshy and Simmons 2006, Metzger, 2006). Non-Caucasian ethnicity is a prominent predisposing factor (Davey and Hamblin, 2001, Hoffman et al., 1998, Solomon et al., 1997) and this association is of particular interest in Australia, where as many as 22% of women giving birth have been themselves born overseas (Laws et al., 2007). A significant number of migrant women in Australia come from regions of South East Asia¹, North East Asia² and Southern Asia³ and these ethnicities are disproportionately represented in GDM statistics (Davey and Hamblin, 2001, Doery et al., 1989, Stone et al., 2002). In addition to presenting more frequently in non Caucasian populations, GDM is also associated with significant ethnic differences in perinatal outcomes, including higher rates of neonatal morbidity (Chawla et al., 2006, Rao, 2006, Silva et al., 2006) although the exact genesis of this association remains unclear. Factors likely to contribute to this situation include: poorer access to services (Kim et al., 2007) and socio economic disparity (Karter et al., 2000, Silva et al., 2006). There is additionally some suggestion that cultural beliefs impact on GDM self management activities (Hjelm et al., 2007).

Self management activities, in consultation with health professionals, form the basis of all diabetes care (Fitzgerald et al., 2000, Solomon et al., 1997) and for women with GDM, specific self management activities include blood glucose monitoring, dietary restriction, exercise regimes (Crowther et al., 2005) and may also include insulin administration (Coustan, 2007). The key to good maternal and fetal outcomes is effective glycaemic control (Crowther et al., 2005) which is based on the woman's self management behaviours. Therefore it is important to understand factors that are likely to impact on self management behaviours, such as patient beliefs and attitudes and social and cultural factors. Although clearly important, the impact of attitudes and beliefs on GDM management has so far received very little attention in the literature. Parallels can, however, be drawn from studies of people living with types 1 and type 2 diabetes. Such studies generally report that patient attitude is a strong predictor of subsequent self management behaviour (Cerkoney and Hart, 1980, Fitzgerald et al., 2000, Gatt and Sammut, 2008) and also that a lower appreciation of diabetes predicts a poorer commitment to self management activities (Peyrot et al., 2005, Skovlund and Peyrot, 2005).

¹ Cambodia, Laos, Myanmar, Thailand and Vietnam

² China, Japan and Korea

³ Sub Himalayan countries such as India, Pakistan, Nepal

The impact of ethnicity on understandings of GDM has been marginally explored and Hjelm et al. (2007) found that patient beliefs and attitudes varied with cultural background and also that specific cultural beliefs impacted on self management activities and adherence to GDM treatment plans (Hjelm et al., 2005, 2008, Silva et al., 2006). Similar findings present in the literature relating to diabetes types 1 and 2 (Glasgow et al., 2007, Schorling and Saunders, 2000). To date, GDM literature remains sparse and much work remains to be done in this area. This is especially the case in Australia and there are, to our knowledge, no studies that explore the intersection of ethnicity and GDM attitudes among an Australian cohort. Women with GDM are largely responsible for their own diabetes care, and effective glycaemic control is predictive of good maternal and fetal outcomes. Thus, it is important that health professionals understand factors, such as attitudes and beliefs, that might impact on self-management behaviours. Large numbers of non Caucasian women, giving birth in Australia, particularly from ethnic backgrounds associated with a high incidence of GDM, such as Vietnamese (Davey and Hamblin, 2001, Doery et al., 1989), Chinese (Davey and Hamblin, 2001), Indian (Berkowitz et al., 1992, Ezimokhai et al., 2006) and Filipino (Davey and Hamblin, 2001, Rao et al., 2006), add a sense of urgency to the current research.

Therefore, this study sought to examine knowledge (Carolan et al. 2009) and attitudes to GDM, among a multi-ethnic population attending for pregnancy care in Melbourne, Australia. The current paper reports specifically on attitudes to GDM.

Methods

The design was a cross sectional survey. Women from Caucasian, Vietnamese, Indian, Chinese and Filipino backgrounds were invited to participate. Once eligibility was established, a 33 item questionnaire was administered to participants. Questionnaires and supporting documentation were translated into Vietnamese, Punjabi, Cantonese and Tagalog (Filipino). The study was approved by hospital and university ethics committees.

Sample and recruitment

The study was conducted at the Pregnancy Diabetes Clinic at XXXXX, located in the Western suburbs of Melbourne, Australia. The hospital serves a large multi-ethnic community, many of whom are recent migrants to Australia. Socio-economic status is generally low by Australian standards [ABS: Australian Bureau of Statistics] (ABS, 2006), meaning that a significant percentage of the population is unemployed and living in public housing. Women were selected, for the study, using the following inclusion criteria:

- Pregnant
- Diagnosis of Gestational diabetes mellitus
- Of Vietnamese, Indian, Chinese, Filipino or Caucasian ethnicity
- Aged 18 or older

Recruitment took place over a 10 month period from February to December 2007. Participants were recruited after they had attended educational sessions with the diabetes educator and dietician. All were seen by the same dietician and one of two diabetes educators. Both diabetes educators worked together to develop and implement the same hospital approved GDM education package. An explanation of the study was given to women who expressed an interest'. Those willing to participate were given an anonymous questionnaire in the language of their choice. Women requiring interpreter services were identified by their histories and were approached by an interpreter to explain the study and to elicit their interest in participating. The interpreters used were hospital employees who were working at the diabetes clinic and who were also employed by the study.

Data Collection

Most women completed the questionnaires as they waited for their clinic appointment. Completed questionnaires were returned to a sealed box in the waiting area. Maternal demographics recorded included self identified ethnicity, country of birth, age; completed years of education; parity and English fluency. The instrument used to measure attitudes was the DAS3, which has been shown to be a valid and reliable measure of diabetes-related attitudes (Anderson et al., 1998). In this case it was modified slightly to be more sensitive to questions regarding GDM rather than diabetes types 1 and 2. This modification included replacing the words diabetes or diabetes 2 with gestational diabetes, for example Q 31. *...women with type 2 diabetes do not usually get complications?* was amended to read. *...women with gestational diabetes do not usually get complications?*

The questionnaire was then translated into Vietnamese, Pubjabi, Cantonese and Tagalog. Translated versions were piloted on 2 women for each language, a total of 8 individuals. This pilot testing was undertaken at the clinic prior to study commencement and aimed to ensure that women understood the words used in the questionnaire. Pilot testing revealed that the questionnaire was well understood generally although women were unsure of the terms diabetes types 1 and 2. Some further minor explanation was therefore added, including a brief description of diabetes types 1 and 2.

There were 33 items comprising five subscales. Each item was measured using a likert scale. Subscales included attitudes towards: 1) need for special training to provide GDM care, 2) seriousness of GDM, 3) value of tight glucose control, 4) psychosocial impact of GDM, and 5) attitude toward patient autonomy (Anderson et al., 1998). Positive statements such as (a) 'gestational diabetes is a very serious condition' were scored from 5 = strongly agree to 1 = strongly disagree, whereas negative statements such as (b) 'blood sugar testing is not needed for women with gestational diabetes' were scored from 1 = strongly agree to 5 = strongly disagree. For each subscale the woman scored in the range of 0 to 40, with the highest scores indicating more positive attitudes to gestational diabetes and commitment to self management processes. Differences in subscale scores relate to variations in question numbers, for example subscale 2 contained 6 questions which resulted in a total possible score of 30, while subscale 3 contained 8 questions resulting in a possible score of 40.

Data Analysis

Statistical analysis was undertaken using SPSS, version 15.0. For categorical variables, associations with ethnic group were assessed using the exact Chi-square test and p-values of less than 0.05 were considered statistically significant (table 1). During DAS3 analysis, it was found that none of the subscales were normally distributed. Therefore, non parametric testing was conducted as the best means to test the skewed data and original scores were used in order to remain sensitive to fine variability. Differences in subscales between ethnic groups were tested using the Mann Whitney U test. Exploratory ancova analyses were also undertaken, adjusting for age and education. The mean and median scores for all 5 DAS3 subscales are shown in table 2. Individuals have been stratified into ethnic groups to facilitate clear presentations.

Results

Questionnaires were distributed to a total of 200 pregnant women who met the inclusion criteria. 143 questionnaires were returned which indicates a return rate of 71.5%. Of these, 3 questionnaires were not included in the study findings due to damage or incomprehensibility. Presented results are for the remaining 140 participants.

Characteristics of the sample

Participants consisted of Vietnamese (n= 45), Indian (n=20), Filipino (n=13) and Caucasian women (n =63). All were Australian citizens or holders of permanent residency visas. There were no Chinese participants due to low numbers of Chinese women attending the clinic during recruitment. Maternal characteristics recorded included age; completed years of education; parity and English fluency (Table 1). Vietnamese women tended to be slightly older than other participants while the Caucasian sample had the greatest percentage of younger women (less than 25 years) (14.5%) and also displayed the greatest age range. Age, however, was not statistically significant (P -value = <0.07). Educational level was generally low, by Australian standards (ABS, 2005), and statistically, there was a highly significant association between ethnic group and years of education (P -value = <0.001). Filipino and Vietnamese women had the lowest levels of education (≤ 8 years of education). Caucasian women were mostly located in the midrange (9-10 years) while Indian women had the highest levels of education (≥ 10 years). Parity was variable and Vietnamese women were the most likely to be multiparous while Caucasian women were the most likely to be primiparous. Parity was not, however, statistically significant between groups (p -value = < 0.11). Vietnamese women had the poorest English skills and more than half required interpreter services.

Table 1 Characteristics of the sample

	Caucasian (n=62)		Filipino (n=13)		Indian (n=20)		Vietnamese (n=45)		<i>P</i> -value
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Age group									0.07
< 25 years	9	14.5%	1	7.7%	1	5.0%	0	0.0%	
25-29 years	10	16.1%	2	15.4%	8	40.0%	9	20.0%	
30-34 years	21	33.9%	6	46.2%	8	40.0%	22	48.9%	
35 years or older	22	35.5%	4	30.8%	3	15.0%	14	31.1%	
Education									<0.001
8 years or less	1	1.6%	7	53.8%	2	10.0%	24	53.3%	
9-10 years	50	80.6%	4	30.8%	3	15.0%	20	44.4%	
> 10 years	11	17.7%	2	15.4%	15	75.0%	1	2.2%	
Parity									0.11
1	32	51.6%	6	46.2%	10	50.0%	11	24.4%	
2	18	29.0%	6	46.2%	6	30.0%	21	46.7%	
3 or more	12	19.4%	1	7.7%	4	20.0%	13	28.9%	
English Fluency									<0.001
Yes	62	100.0%	13	100.0%	20	100.0%	21	46.7%	
No	0	0.0%	0	0.0%	0	0.0%	24	53.3%	

P-values were obtained using the exact Chi-square test. For English fluency, the test was an exact chi-square test.

Participants generally agreed that there was a need for special training for health professionals providing GDM care to women (subscale 1). This belief was expressed more strongly by Indian and Caucasian women compared to Vietnamese and Filipino women though differences between ethnic groups did not reach statistical significance. Scores for the seriousness of GDM (subscale 2), were low across all ethnic groups and again Filipino and Vietnamese women recorded lowest scores. Education ($p=0.013$) had a significant effect on this subscale and women with higher levels of education were more likely to record higher scores. Caucasian and Indian women expressed a stronger belief in the value of tight glucose control (subscale 3) compared to Vietnamese and Filipino women. The impact of education was significant for this subscale ($p=0.02$) as were the means between ethnic groups ($p=0.019$). However, when tested between specific Ethnic groups, between group differences reached significance only between Caucasian and Vietnamese groups ($p=0.035$).

There was some difference, among the groups, in the perception of negative psychological effects (subscale 4) related to GDM, though differences did not meet statistical significance. Lowest scores were recorded among Indian and Vietnamese women. Scores for patient autonomy (subscale 5) were also low overall, though again autonomy was more highly valued by Caucasian and Filipino women compared to Indian and Vietnamese women.

Table 2 subscales scores for ethnic groups (n= 140)

Ethnic groups		Caucasian (n=62)			Filipino (n=13)			Indian (n=20)			Vietnamese (n=45)		
Possible score	Subscale	Mean	Med	SD	Mean	Med	SD	Mean	Med	SD	Mean	Med	SD
30	Need for special training	24.15	24.0	4.05	23.54	25.0	3.61	25.35	25.0	2.54	23.85	25.0	3.77
30	Seriousness of GDM	21.05	22.0	3.85	19.87	20.5	1.95	20.60	21.0	3.42	20.36	20.0	2.58
40	Value of tight control	30.50	30.0	4.69	27.33	27.0	2.73	29.20	30.0	4.78	28.02	28.0	3.59
30	Psychological impact	21.07	21.0	3.64	20.62	20.0	3.96	20.00	19.5	3.37	20.08	19.0	3.89
35	Patient autonomy	24.12	24.0	2.55	23.25	23.0	1.58	24.00	23.0	2.90	24.74	25.0	2.83

^a Significant difference between ethnic groups for tight glucose control P=0.019)

^b Significant difference between Caucasian and Vietnamese groups for tight glucose control P=0.035

^c Level of education significant for seriousness of GDM P=0.013

^d Level of education significant for tight control P=0.02

Discussion

This is the first study, that we are aware of, that has considered attitudes towards GDM among a multi ethnic cohort in Australia. As such, this study provides baseline information for maternity services providers who are engaged in the provision of GDM care for this growing group of parturient women. Attitudes to GDM were measured in five subscales including: 1) need for special training to provide GDM care, 2) seriousness of GDM, 3) value of tight glucose control, 4) psychosocial impact of GDM, and 5) attitude toward patient autonomy. There were three principal findings. Firstly, all groups scored in the lower ranges for subscales 2-5, compared to other studies using the DAS3 questionnaire (Anderson et al., 1991, Clark and Hampson, 2003, Fisk et al., 2001, Sharp and Lipsky, 2002). Secondly, educational level was associated with poorer scoring for subscales 2 and 3, and this finding was seen across all ethnic groups. Finally, differences in attitudes and beliefs were noted between cultural groups.

We found low scores for subscales 2-5 for all ethnic groups compared to other studies employing the DAS3 questionnaire (Anderson et al., 1991, Clark and Hampson, 2003, Fisk et al., 2001, Sharp and Lipsky, 2002). Participants here, irrespective of ethnic group, displayed a lesser appreciation of GDM as a serious condition and this finding has implications for GDM diabetes self management. Although the GDM literature is not insufficiently robust at this time to allow meaningful comparison, parallels can be drawn from studies of diabetes types 1 and 2. In this literature, less serious understanding of diabetes has been extensively linked to poorer self management (Anderson et al., 1988, Cekroney and Hart, 1980, Fitzgerald et al., 2000, Gatt and Sammut, 2008, McCord and Brandenburg, 1995, Polly, 1992). These studies clearly indicate a strong link between attitude and

diabetes related behaviours. Gatt and Sammut (2008), for example, found that beliefs and attitudes impacted on the way in which participants intended to self manage their diabetes while McCord and Brandenburg (1995) found that patients who believed that diabetes would not seriously affect their lives, were less likely to adhere to treatment plans. Ceronkey and Hart (1980), Polly (1992) and Schorling and Saunders (2000) all reported that individual beliefs about the seriousness of diabetes actually impacted on glycaemic control, with lower concerns resulting in lower attention to care. Meanwhile Clark and Hampson (2003) suggested that behavioural changes were less sustainable in the face of under-appreciation of diabetes risks. Collectively, these findings suggest that women in the current study were at risk of poorer self management by virtue of a lower understanding of GDM as a serious concern. Moreover, this risk was greatest among Filipino and Vietnamese women, who recorded lowest scores.

Similarly, a range of low scores were found for subscale 3, tight glucose control, and once again, lowest scores were recorded among Filipino and Vietnamese women, the groups with the lowest levels of education. Level of education, but not age or English fluency, was found to be significant for this subscale, which suggests an association between lower education levels and a lower understanding of glycaemic control. A similar association has been found between educational level and knowledge of GDM (Carolan et al., 2009). As the GDM literature does not address this issue specifically, parallels have again been drawn from the diabetes literature. In this literature, lower educational level and lower literacy were also linked to poorer understanding of diabetes (Hawthorne and Tomlinson, 1999, Rothman et al., 2005, Thackeray et al., 2004). Thackeray (2004), for example, found that poorer literacy among Hispanics meant that as many as half knew little about the symptoms of hypoglycaemia. Meanwhile, Hawthorne and Tomlinson (1999) found that Pakistani women who could not read were likely to display poorer glycaemic control and less capacity to manage their condition when complexities arose. This finding was not necessarily related to knowledge deficit but to a lesser ability to problem solve. Other authors have suggested that attitude and motivation (Rothman et al., 2008, Tan and Margarey, 2008) as well as family and cultural influences (Thackeray et al., 2004) substantially impact on tight glucose control.

Subscales 4 and 5, negative psychological effects of GDM, and patient autonomy, measured low across all groups here, and this is in contrast to earlier studies using the DAS3 questionnaire (Clark and Hampson, 2003, Fisk et al., 2001, Sharp and Lipsky, 2002). Differences were also noted among ethnic groups and Caucasian and Filipino women reported a greater degree of psychological impact and a greater valuing of patient autonomy compared to Indian and Vietnamese women. These findings were not significantly related to educational level or age and may simply relate to cultural differences between the groups. Although no studies were found, that examined the effect of culture on psychological impact among women with GDM, studies addressing specific cultures may offer some explanation. For example, a lack of individuality is commonly reported among women in Asian cultures (Davis, 2000, Kozuki et al., 2006, Rutledge, 1992) and the needs of individual women are often considered secondary to those of the family (Davis, 2000, Rutledge, 1992). Similarly, low levels of personal autonomy are documented (Hennink et al., 1998, Raj and Silverman, 2003) and these traits may together give rise to a lower expectation of patient autonomy and may also reduce the level of psychological impact of GDM by rendering the woman less accountable as an individual.

In terms of the overall finding of lower general scores than among comparable studies, three possible explanations are posited. In the first instance, earlier studies were conducted among participants with diabetes types 1 and 2 and findings of lower appreciation of seriousness and tight glucose control in the current study may simply relate to differences between perceptions of diabetes types 1 and 2 compared to GDM, in terms of permanency. GDM is generally understood as a transient condition

and as likely to exist for the duration of the pregnancy only. This view may have impacted on the seriousness participants here attributed to the condition. In the second instance, many earlier studies employed a comparison between differing health professionals and between patients and health professionals, with the result that scores tended to be higher for seriousness of diabetes and tight control. These higher scores, in turn, may give rise to an unnatural benchmark against which participants here scored poorly. Finally, this study was set in a lower socio-economic area and levels of education for all groups was lower than general Australian standards (ABS, 2005). This social factor may have contributed to lower scores across all groups.

Limitations

Some study limitations are acknowledged and low numbers of Indian and Filipino participants limit the overall generalizability of the findings. Moreover, a Chinese sample was anticipated, although low numbers of Chinese women attending the clinic during the recruitment period meant that it was not possible to include this group. Between group differences were noted only between Caucasian and Vietnamese groups and this may be because the sample size for these groups was much larger. Finally, despite piloting the survey questions among the different ethnic groups, it is possible that some misinterpretation of questions and concepts may still have occurred.

Conclusions and implications for practice

Based on the results of this study, we would suggest that educational strategies need to be put in place to support women from different cultures to understand GDM as a serious condition. There are two areas of recommended attention. Firstly, the context of information given is recognised as important and as likely to have an impact on the beliefs and attitudes of women with GDM (Hjelm et al., 2008). These authors found that beliefs and attitudes, expressed by women with GDM, bore a strong correspondence to the health care model within which they were treated and also to the attitudes of healthcare professionals the women encountered (Hjelm et al., 2008). Bearing this in mind, it is important that nurses, midwives, doctors and diabetes educators find a balance between discussing GDM, as a transient pregnancy related condition, and as a future risk for type 2 diabetes. Secondly, issues of low education and subsequent lower health literacy (the ability to process health related information) need to be addressed among women from all cultural backgrounds. Lower health literacy is often coupled with poorer English language skills (Bennett et al., 2007, Gucciardi et al., 2006, Pope, 2005) and while this is a valid association, language proficiency is not the only factor involved. English language proficiency alone has been shown to be insufficient to ensure comprehension of proffered material or endorsement of content (Carolan et al., 2009). In the current study, proficiency in English was not predictive of higher scores and Filipino women, who were all proficient in English, nonetheless recorded the lowest scores. Their scores were lower than scores recorded for Vietnamese women, of whom 50% were not proficient in English. This finding of lower scores seems to relate to lower health literacy and cultural beliefs rather than English language proficiency alone. Therefore, we would suggest that it is important for health professionals to develop educational strategies that address both lower health literacy and cultural variation. The ACP [American College of Physicians] guidelines (2007) is one format which could be used. These guidelines suggest that information should be provided in simple language (grade 5 English) with just one or two important points at one time. Pictures are used to convey food related information such as portion sizes, healthy foods and appropriate snacks. Pictures can convey diet related information on foods commonly eaten in specific cultures. The availability of language specific information

for individuals from other primary language groups, even when fluent in English, may also assist comprehension and go some way towards addressing cultural factors.

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