

Special Article – Primary Healthcare

Primary Health Care Staff Knowledge and Practices towards Gestational Diabetes Mellitus in Kuwait

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This cross-sectional study of how gestational diabetes mellitus (GDM) is being dealt with in the PHC system in Kuwait highlights a number of important gaps in policy, guidelines and practices. It found important differences in how GDM is perceived in 24 primary healthcare centres in the country and how the lack of a national policy encourages individual PHC centres to develop their own approach to gestational diabetes. Most respondents said that screening for GDM is done during the first antenatal visit. Only 33% indicated that it is done at the recommended time, namely between the 24th and 28th week of pregnancy. When GDM is diagnosed, women are referred to specialised hospitals, and almost half of the respondents felt that GDM patients are subsequently lost to follow-up at the PHC level, because information is not routinely looped back to the PHC centres. Only 24% and 29% of PHC staff said that mothers are typically provided with GDM counselling or information, respectively in the PHC centres. PHC staff agreed that management of GDM at the primary care level could improve continuity of care, cost-effectiveness, and be psychologically better for women. At the same time they acknowledged that PHC centres do not currently have the capacity to take on this responsibility in the absence of more training.

If the Kuwaiti PHC system is to play a more important role in the management of GDM, more attention must be given to strengthening PHC staff knowledge and practices in this area.

Keywords: Gestational Diabetes; Primary Health Care**Abbreviations**

GDM: Gestational Diabetes Mellitus; PHC: Primary Health Care; IDF: International Diabetes Federation; T2DM: Type 2 Diabetes Mellitus; GCC: Gulf Cooperation Council; DDI: Dasman Diabetes Institute; ob/gyn: obstetric and gynaecological; GPs: General Practitioners; WHO: World Health Organisation; SOPs: Standard Operating Procedures.

Introduction

Gestational Diabetes Mellitus (GDM) is a form of diabetes whose onset is usually diagnosed around the 25th week of pregnancy, and whose remission typically follows delivery [1]. GDM accounts for around 90% of all cases of diabetes in pregnancy [2] and presents a number of challenges for the health of the pregnant woman both during and after pregnancy [3] as well as for the foetus and the new born infant [4]. In the pregnant woman, there is a heightened risk of pre-eclampsia, premature labour and complicated delivery followed by a significant risk of developing type 2 diabetes mellitus (T2DM) in the subsequent ten years [5,6,7]. They are also likely to develop GDM in any subsequent pregnancies. In the case of the foetus, new born infant and young child, GDM is associated with macrosomia, foetal death, neonatal hypoglycaemia and hyperbilirubinaemia [8-11]. GDM is also known to increase the risk of impaired glucose tolerance, childhood obesity and type 2 diabetes later in life [3,12,13]. Given that at any point in time approximately 113 million women in the world become pregnant, GDM constitutes a major global public

health challenge.

The International Diabetes Federation (IDF) estimates the global prevalence of GDM to be 15% [14], but the precise prevalence of the condition remains poorly defined, in part because of the lack of epidemiological research and the tendency for different diagnostic methods to be used, even within countries [15-17]. Rates of GDM can nevertheless be expected to vary between countries in concert with the prevalence of T2DM in the larger population [13], and particularly among certain ethnic groups [18,19].

GDM has become a major problem in the Gulf Cooperation Council (GCC) countries [16] (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates). In Saudi Arabia the prevalence of GDM has been estimated to be 12.5% [20], and in Bahrain 10.1% [21]. A higher prevalence range of 13% [22] to 24.9% [15] has been estimated for the United Arab Emirates. In a region characterised by a large expatriate labour force, there is also evidence of GDM patterns varying according to ethnicity; South Asian women are at a higher risk than women of other ethnic backgrounds [23-25].

In Kuwait, where almost all deliveries take place in hospitals [26], the policy is for pregnant women to be first seen at either a public health centre or at a private clinic. There are 94 Primary Health Care (PHC) centres in Kuwait, providing a range of services, including antenatal care. While all PHC centres provide obstetric and gynaecological services, women in need of specialized care are systematically referred to tertiary care hospitals. It is estimated that approximately 72% of all pregnant women are referred for tertiary level care at some point

Table 1: Number of participants from each region.

Capital	Hawalli	Farwaniya	Ahmadi	Jahra	Total
24	17	21	28	14	104

Table 2: Perceived length of PHC follow-up for GDM women and infants.

Length of follow-up	Follow-up of GDM mothers		Follow of GDM infants	
	Frequency	Percentage (n=104)	Frequency	Percentage (n=10)
For 1 month	30	28.6	33	31.7
For 6 months	27	25.7	18	17.3
For 12 months	3	2.9	1	1
For 18 months	0	0	0	0
For 24 months	1	1	2	1.9
Longer than 24 months	2	1.9	1	1
Don't know	34	32.4		

in their pregnancies; pre-eclampsia, hypertension, and GDM are the main causes for referral.

Method

The proposal for this project was reviewed and approved by the Dasman Diabetes Institute (DDI) and the Kuwaiti Ministry of Health. In preparing the project, visits were made to Primary Health Centre Directors in all the six governorates to discuss the aim and proposed methodology of the project. The response of the Directors was unanimously positive and indicative of a perceived need to address the theme of GDM and the role of the PHC system in its management. A self-completed questionnaire was developed and draft versions were reviewed with researchers at the DDI before being pre-tested in four randomly selected PHC centres. A decision was taken to print the questionnaires in English given the high level of English fluency among both Kuwaiti and expatriate personnel working in the PHC system. In all, 24 Primary Health Care centres were selected from five of Kuwait's six administrative Governorates: Capital, Hawalli, Farwaniya, Ahmadi and Jahra. The PHC centre Directors distributed the questionnaires to 174 staff. All the PHC centres in the project were visited by the two main researchers to ensure that instructions for the survey were understood and being followed. Table 1 shows the number of healthcare staff who participated in each governorate. The introduction to the questionnaire made it clear that the survey was anonymous and confidential. Data were analysed using SPSS 21, taking significance levels at $p=0.05$. As the majority of results were nominal, or because some survey based data had few categories, Pearson's Chi Squared tests were employed where applicable for unpaired discrete data; otherwise simple descriptive frequencies and percentages were used.

Results

Policies and guidelines

Respondents were asked about policies on GDM in Kuwait, and while over half of the respondents from the Ahmadi (57.1%) and Jahra (57.1%) PHC centres thought that a policy on GDM was well known, only 17.6% of the staff in Hawalli and 19% from Farwaniya agreed with this. In all, less than half (40.8%) of all the respondents felt a GDM policy was being promoted. Questions concerning

guidelines and standard operating procedures (SOPs) elicited much the same degree of variability; in Jahra 71.4% of the respondents felt that SOPs were well known, while in Farwaniya to only 15% thought this was the case. In Ahmadi 66.7% said they felt that guidelines were being followed in the management of GDM, while in Farwaniya only 10% agreed. Only 33.7% of respondents felt that all obstetric and gynaecological (ob/gyn) staff were aware of the implications of GDM.

Screening

The vast majority (96.2%) of the respondents felt that pregnant women in Kuwait are being routinely screened for GDM, but only 23.1% of participants said that screening for pre-existing diabetes was routine. Most (82%) said that women are screened at the first antenatal visit; only 32.7% of respondents said that women are screened between the 24th-28th week; and 13.5% referred to GDM screening after 28 weeks. There were significant differences between different Governorates ($p=0.003$) in the case of screening at 24-28 weeks. In the Hawalli and Jahra areas staff were less likely to screen for GDM at 24-28 weeks (5.9% and 7.1% of staff respectively), than in Ahmadi (35.7%), Capital (54.2%) and Farwaniya (42.9%). Respondents were also asked who they thought was responsible for GDM screening and what tests are being used. In general, gynaecologists were the most frequently mentioned (93.3%). Only 17 participants mentioned diabetologists as responsible and 10 respondents mentioned general practitioners (GPs). Nurses and midwives were noticeably absent from the list of people seen as having responsibility for screening. The WHO recommended method for screening emerged as the most common technique (72.1%); while 22.1% referred to the Classic Diagnostic test, and 4.8% referred to "other" techniques.

Treatment and management

When GDM is diagnosed, 72.1% of respondents said that women should be referred for treatment at a specialist hospital. Only 1.9% said that women with GDM were being provided with treatment for GDM at their PHC centre, but 24% said that women with GDM were provided with some counselling, and less than a third (29.8%) said information on GDM was given out at their centre. In terms of who delivers GDM counselling, 85.6% said gynaecologists, followed by diabetologists (50%); GPs (6.7%), nurses (5.8%) and midwives (1%).

Although 41.3% of the respondents said that women are asked to return to their PHC centres after delivery, almost a half (45.2%) said that patient information is not looped back to PHC centres once women are referred to specialized hospitals, and the same proportion of respondents felt that patients were usually lost to follow-up by PHC centres as a result of this.

Thus despite the risk of GDM mothers and babies developing health problems, post-partum monitoring is not routine at the PHC level (Table 2). Only 28.6% said that mothers were followed up after 1 month, and 25.7% at 6 months post-partum. Similarly, only 31.7% said that GDM infants were followed up at PHC centres for 1 month, and 17.3% for 6 months. At 12 and 24 months post-partum only Ahmadi PHC centres appeared to be following up GDM women, and even there it was low (3 mothers at 12 months and 1 at 24 months). Almost a third (32.4%) said they did not know if mothers were being followed up or not.

Respondents were also asked about how they saw the capacity

Table 3: Respondents' agreement with PHC capacity statements.

Perceived PHC Capacity	Agree Frequency (n)	Disagree Frequency (n)
Women with GDM need not be routinely referred to hospital	30	69
Women with GDM should be routinely treated at PHC level	32	64
Women who are referred to hospital often lost to follow up	59	38
PHC clinics already have the capacity to manage GDM	30	68
Managing GDM at PHC clinic level would improve continuity of care	76	21
Managing GDM at PHC clinic would be psychologically better for women	83	15
Managing GDM at PHC clinic level would be more cost effective	62	33

of PHC centres to deal with GDM and whether mothers diagnosed with GDM needed to be referred to specialized hospitals. The results shown in Table 3 indicate that about a third felt that women should be treated at the PHC level and did not need to be routinely referred for specialized hospital care. There was wide agreement that managing GDM at the primary care level would improve the continuity of care, would be cost-effective and most important of all, and would be psychologically better for the women concerned. Two thirds of the respondents nevertheless felt that PHC centres are currently ill prepared to provide the care needed.

Discussion

While there was widespread agreement that pregnant women are being routinely screened for GDM only a third of the respondents said that screening was being done at the internationally recommended time, that is to say between the 24th and 28th. Literature suggests that routine screening before the 24th week may be of little public health benefit [27]. However, given that in Kuwait over 50% of women meet criteria for obesity [28], this may explain why earlier screening is being done, but whether this is indeed the reason is not clear. As far as action in response to GDM is concerned, almost all respondents felt that GDM screening is primarily the responsibility of gynaecologists, followed by diabetologists; very few mentioned nurses. All women diagnosed with GDM are referred to specialized hospitals and there was little evidence of any counselling or any treatment for GDM in PHC centres. The fact that only 24% of the respondents said that mothers were being provided with counselling at the PHC level is indicative of a poorly used resource. There was also considerable agreement that once women are referred to hospitals they are lost to follow-up at the PHC level, including any monitoring of the mother and/or the infant for any adverse GDM-related outcomes. Most of the respondents felt that more could and should be done on GDM at the PHC level, and that doing so would improve continuity of care, be more economical, and would improve the psychological wellbeing of women with GDM.

Conclusions

GDM constitutes an important and probably growing problem

in Kuwait, and if the prevalence of GDM does indeed mirror type 2 diabetes trends [29], it can be expected to grow significantly in coming years. How best to deal with GDM is a challenge all countries are facing. In the case of Kuwait, where there is a robust Primary Health Care system that already has a capacity for antenatal care, the solution may well be to give the PHC system more responsibility for the care and treatment of women diagnosed with GDM. This will relieve pressure on tertiary hospitals, provide continuity of care at PHC centres that women are familiar with, and allow for more systematic post-natal follow up of mothers and infants. For this to be possible, however, calls for further strengthening of the PHC system through in-service training of antenatal care staff. It also calls for a national policy and nationally approved guidelines and standard operating procedures on GDM diagnosis, treatment and follow-up.

References

- Metzger BE, Coustan DR. Summary and recommendations of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus; The Organizing Committee. *Diabetes Care*. 1998; 21: 161–167.
- Al-Azemi, Diejomaoh MF, Angelaki E, Mohammed AT. Clinical presentation and management of diabetes mellitus in pregnancy. *International Journal of Women's Health*. 2014; 6: 1-10.
- Lee AJ, Hiscock RJ, Wein P, Walker SP, Permezel M. Gestational diabetes mellitus: clinical predictors and long-term risk of developing type 2 diabetes: a retrospective cohort study using survival analysis. *Diabetes Care*. 2007; 30: 878-883.
- Reece EA, Leguizamon G, Wizniter A. Gestational Diabetes: the need for a common ground. *Lancet*. 2009; 373 : 1789-1797.
- Alshammari A, Hanley A, Ni A, Tomlinson G, Feig DS. Does the presence of polycystic ovary syndrome increase the risk of obstetrical complications in women with gestational diabetes. *J Matern Fetal Neonatal Med*. 2010; 23: 545-549.
- Kim C, Newton KM, Knopp RH. Gestational diabetes and the incidence of type 2 diabetes: a systematic review. *Diabetes Care*; 2002; 25: 1862-1868.
- Nerenberg KA, Johnson JA, Leung B, Savu A, Ryan EA, Chik CL, et al. Risks of gestational diabetes and preeclampsia over the last decade in a cohort of Alberta women. *J Obstet Gynaecol Can*. 2013; 35: 986-994.
- Kc K, Shakya S, Zhang H. Gestational diabetes mellitus and macrosomia: a literature review. *Ann Nutr Metab*. 2015; 66; 14-20.
- Petry CJ. *Gestational Diabetes; origins, complications and treatment*. CRC Press Taylor and Francis Group; New York 2014.
- Wu ET, Nien FJ, Kuo CH, Chen SC, Chen KY, Chuang LM, et al. Diagnosis of more gestational diabetes lead to better pregnancy outcomes: comparing the international Association of the Diabetes and Pregnancy Study Group criteria, and the Carpenter and Coustan criteria. *J Diabetes Investig*. 2016; 7: 121-126.
- Jones CW. Gestational diabetes and its impact on the neonate. *Neonatal Network*. 2001; 20: 17-23.
- Boney C, Verma A, Tucker R, Vohr B. Metabolic Syndrome in Childhood: Association with Birth Weight, Maternal Obesity, and Gestational Diabetes Mellitus. *Pediatrics*. 2005; 115: 290-296.
- International Diabetes Federation. *IDF Diabetes Atlas seventh edition*. IDF 2015.
- International Diabetes Federation. *Gestational Diabetes*. 2016.
- Agarwal MM, Dhatt GS, Puunnose J, Koster G. Gestational Diabetes: dilemma caused by multiple international diagnostic criteria. *Diabetes Med*. 2005; 22: 1731-1736.
- Okunoye G, Konje J, Lindow S, Perva S. Gestational Diabetes in the Gulf Region: Streamlining care to optimise outcome. *Journal of Global Local Health Science*. 2015; 2.

17. Cosson E, Benchimol M, Carbillon L, Pharisien I, Paries J, Valensi P, et al. Universal rather than selective screening for gestational diabetes mellitus may improve fetal outcomes. *Diabetes Metabolism*. 2006; 32: 140-146.
18. Ferrara A. Increasing Prevalence of Gestational Diabetes Mellitus: a public health perspective. *Diabetes Care*, 2007; 30; 141-146.
19. Hunt KJ, Schuller KL. The increasing prevalence of diabetes in pregnancy. *Obstet Gynecol Clin North Am*. 2007; 34: 173-199.
20. Ardawi MS, Nasrat HA, Jamal HS, Al-Sagaaf HM, Mustafa BE. Screening for gestational diabetes mellitus in pregnant females. *Saudi Med J*. 2000; 21: 155-160.
21. Rajab KE, Issa AA, Hasan ZA, Rajab E, Jaradat AA. Incidence of gestational diabetes mellitus in Bahrain from 2002 to 2010. *Int J Gynaecol Obstet*. 2012; 117: 74-77.
22. Agarwal MM. Gestational diabetes mellitus: an update on the current international diagnostic criteria. *World Journal of Diabetes*. 2015 ; 6: 782-791.
23. Al-Kuwari MG, Al-Kubaisi BS. Prevalence and Predictors of gestational diabetes in Qatar. *Diabetologia Croatica*. 2011; 40; 65-70.
24. Toumi H. 10% pregnant Qatari women suffer from gestational diabetes. 2011.
25. Al-Azemi N, Diejomaoh MF, Angelaki E and Mohammed AT. Clinical presentation and management of diabetes mellitus in pregnancy. *Int J Womens Health*. 2014; 6: 1-10.
26. Central Statistical Bureau, Ministry of Health, Kuwait. Annual Bulletin of Health Statistics. 2013, State of Kuwait.
27. U.S Prevention Services Task Force. Screening for Gestational Diabetes mellitus: Recommendation Statement. *American Family Physician*. 2014; 1; 90: 790A-790C.
28. Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, et al. Global, regional and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*. 2014; 384: 766-781.
29. Ziyab AH, Mohammad A, Maclean E, Bahbehani K, Carballo M. Diabetes: A fast evolving Epidemic. *Kuwait Medical Journal*, 2015; 47: 291-301.