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Original Research

Evaluation of knowledge regarding gestational diabetes mellitus and its association with glycaemic level: A Malaysian study

Zahid Hussain*, Zuraidah Mohd Yusoff, Syed Azhar Syed Sulaiman

Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Malaysia

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ABSTRACT

Aims: The aim of this study was to evaluate the knowledge about GDM and its corresponding relation with glycaemic level in GDM patients.

Method: A cross-sectional study was conducted in antenatal clinic of Hospital Pulau Pinang, Malaysia from June 2013 to December 2013 using Gestational Diabetes Mellitus Knowledge Questionnaire (GDMKQ) on the sample of 175 GDM patients. Three most recent fasting plasma glucose (FPG) values (mmol/l) were taken from patients profiles and mean was calculated.

Results: A total of 166 patients were included in final analysis. A total mean knowledge score of 166 patients was 10.01 ± 3.63 and total mean FPG value was 5.50 ± 1.13 . Knowledge had a significant negative association with FPG ($r = -0.306$, $P < 0.01$). Among different knowledge domains, highest mean score was seen for diet/food values domain and lowest for management of GDM. Educational level seems to be the most significant predictor of GDM knowledge and glycaemic control. Highest mean knowledge score and lowest mean glycaemic levels were recorded for patients aged 25–29 years, Malay ethnicity, working women and family history of DM.

Conclusion: Higher Knowledge about GDM is related to better glycaemic control. New educational strategies should be developed to improve the lower health literacy.

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1. Introduction

Several studies reported the prevalence of GDM in different countries depending upon the diagnostic criteria used locally. Incidence of GDM is higher in non white population as compared to Caucasian [1]. Prevalence of GDM is highest among Asians and especially among Indian Asians [2].

GDM prevalence ranges from <1% in Germany to 28% in Nepal [3]. Prevalence of GDM is 4–10% in USA and 5% in UK [4,5]. According to National obstetrics registry (NOR) of Malaysia, prevalence of GDM is 11.1% among Malaysian population [6].

This increasing prevalence of GDM is associated with increase in rate of obesity and diabetes mellitus [7]. Other risk factors related to the development of GDM are; maternal age > 35 years, family history of diabetes, Asian ethnicity,

* Corresponding author. Tel.: +60 102742025; fax: +60 46570017.

E-mail addresses: dr_zhussain@yahoo.com, zh12_pha089@student.usm.my (Z. Hussain).

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history of caesarean section, macrosomic baby and still birth [8,9]. A recent study indicated that sleep disturbances may also be associated with glucose intolerance which in turn increases the risk of GDM [10]. Women with GDM are also at increase risk of development of permanent diabetes in future [11,12]. Poorly managed GDM results in number of undesirable maternal-foetal events such as miscarriages, lengthened labour pain, caesarean section, macrosomia, shoulder dystocia, neonatal hypoglycaemia, still birth and neonatal death [7,13-18].

Well controlled GDM results in reduction of these unfavourable outcomes [19]. Proper management of GDM is the most important factor for better health outcomes [20,21]. Management of GDM is principally dependent on active care measures taken by women to keep their glycaemic levels normal [1]. It depends on the sufficient health literacy including patient's knowledge about normal and abnormal glycaemic values, dietary values, food restraints and importance of physical activity [22-24]. Knowledge is considered as one of the important component of health literacy [25]. Inadequate health literacy is associated with limited knowledge about disease. It results in limited adherence to disease management strategies which in turn leads to unfavourable maternal and foetal outcomes [22,26,27]. Although, a number of studies reporting the knowledge evaluation among type 1 and type 2 DM patients but a literature related to knowledge evaluation among GDM patients is scarce. Therefore, present study aimed to evaluate knowledge of patients suffering from GDM about different aspects of disease including general knowledge about the disease, risk factors, diet, food, complications, prognosis and health outcomes. The secondary objective of this study was to access the association between extent of knowledge and glycaemic levels of study participants.

2. Method

2.1. Ethical approval

This study was approved by local hospital Clinical Research Committee (CRC), National Institute of Health (NIH), Malaysia and Medical Research and Ethics Committee (MREC), Malaysia (Ethical approval number 13-612-16135). Patients were informed that participation is entirely voluntary and don't involve any risk of harm to their health. Written consent was taken from patients prior to enrolment.

2.2. Participants and setting

A cross sectional study design was used and the study was conducted in the antenatal clinic of Hospital Pulau Pinang, Malaysia. This is the largest tertiary care public hospital in Penang state [28]. The study was conducted from June to December 2013. A total 188 eligible patients were invited and out of which 175 agreed to take part in the study. Inclusion criteria were; patients diagnosed with diabetes during pregnancy, age above 18 years, can read and understand Malaysian Language (Bahasa Melayu) and diagnosed with GDM at least 4 weeks prior to enrolment. Patient information sheet was given to all the patients who met inclusion criteria.

2.3. Development of questionnaire and sampling procedure

Data was collected by using self administered questionnaire by a pharmacist (principal investigator). Based on extensive literature review no questionnaire was found that specifically related to knowledge evaluation among GDM patients. Research team designed a questionnaire named Gestational Diabetes Mellitus Knowledge Questionnaire (GDMKQ). Basic theme of questionnaire was taken from Diabetes Knowledge Questionnaire (DKN), a well validated tool for knowledge assessment among type 1 and type 2 diabetes mellitus patients [29]. Some modifications were made and new questions particularly related to GDM were included after a detailed discussion with experts' team from different health-care professionals. Questionnaire was validated by experts' panel including specialists and physicians from obstetrics and gynaecology department of Hospital Pulau Pinang (PH), lecturers of School of Pharmacy of Universiti Sains Malaysia (USM), registered pharmacists, and PhD scholars from pharmacy practice division. Questionnaire was translated and back translated into Bahasa Melayu (National language of Malaysia) to ensure that essential meaning of questionnaire remained preserved and translated version was validated in terms of its face and content validity. After validation and translation questionnaire was piloted on 30 patients to evaluate its reliability. Reliability analysis showed the Cronbach's alpha of GDMKQ was 0.77. Final version of GDMKQ consists of 15 questions divided into five main categories which are basic knowledge about GDM (3 questions), risk factors (3 questions), food and diet values (3 questions), management (3 questions) and complications/outcomes (3 questions). All questions were in multiple choice format with one option was "I don't know" to avoid unnecessary guess by the participants. Score 1 was given to every right answer and 0 to every wrong answer. Higher score indicate better knowledge about GDM. Thus the maximum score is 15 and minimum is 0.

Glycaemic values were recorded in terms of fasting plasma glucose (FPG). Three most recent values of FPG were taken from patients medical profiles and mean was calculated. Though HbA1c is considered as an accurate marker for glycaemic measurement over a long period of time, but due to short lived nature of GDM, values of HbA1c could not be taken as a standard so as an alternative, values of FPG were taken. Research has shown that Plasma Glucose (PG) has a direct association with HbA1c [30]. As indicated by antenatal care, division of family health development, Ministry of Health, Malaysia, FPG values above ≥ 5.6 mmol/l indicative of poorly controlled GDM [31].

2.4. Statistical method

All the statistical analysis was done by using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL) version 20. Number and percentage were used for grouped variables whereas mean and standard deviation was used for continuous variables. Responses to all questions of GDMKQ were recorded in numbers and percentages. Association of demographic characteristics with knowledge score and glycaemic level of patients were represented by using Mann Whitney U

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