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CLINICAL ARTICLE

Q1 A snapshot of current gestational diabetes management practices from
 3 26 low-income and lower middle-income countries

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ABSTRACT

Objective: To identify screening and management practices for gestational diabetes mellitus (GDM) in low- 17
 income and lower middle-income countries. *Methods:* A cross-sectional survey was conducted between November 18
 12, 2014 and May 11, 2015. Questionnaires were distributed to gynecologists, endocrinologists, and medical 19
 doctors who were representatives of national professional societies or were involved in providing care to patients 20
 with GDM in low-income or lower middle-income countries in Africa, South Asia, and Latin America. The data 21
 were descriptively analyzed. *Results:* Questionnaires were sent to 182 individuals and 77 healthcare providers 22
 from 26 countries completed the survey. The results demonstrated high diversity in screening and management 23
 practices. Only 52 (68%) participants reported that any guidelines were available in their setting. Management 24
 of GDM was found to take place mainly at the tertiary level and reported practices, including the frequency of 25
 post-diagnosis follow-up, modalities of glucose surveillance, and treatment and practices surrounding delivery, 26
 varied and did not always reflect the most recent evidence. *Conclusion:* Attempts to ensure greater adherence to 27
 latest consensus guidelines are required, and should be accompanied by systemic changes to improve the 28
 detection and management of GDM at primary- and secondary-level healthcare facilities to facilitate patient access 29
 to GDM screening and treatment. 30

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1. Introduction

40 Globally, the burden of diabetes is growing owing to changes in life 41
 42 style, urbanization, and changes in traditional dietary patterns. Similarly, 43
 44 the prevalence of gestational diabetes mellitus (GDM) is increasing and is 45
 46 accompanied by risks for a range of immediate complications including 47
 48 maternal hypertensive disorders, shoulder dystocia, macrosomia, pre- 49
 50 term delivery, and stillbirth [1,2]. Furthermore, GDM contributes to the 51
 52 potential future disease burden through an increased risk of developing 53
 54 manifest diabetes among women and neonates [3,4].

55 Despite its immediate and long-term consequences, GDM is not yet 56
 57 high on the healthcare agenda in countries that are still struggling to re- 58
 59 duce their existing maternal mortality rate. Reported GDM prevalence 60
 61 rates of up to 14% in Sub-Saharan Africa [5] and 18% in Southern Asia 62
 63 [6] indicate that GDM is slowly becoming a major public-health 64
 65 problem. As data on the management of GDM in low-income and 66
 67 lower middle-income countries (LLMIC) are scarce, the aim of the 68
 69 present study was to identify current screening and clinical practices 70
 71 for GDM in LLMIC.

2. Materials and methods

60 A cross-sectional study was conducted during a 6-month period 61
 62 from November 12, 2014 to May 11, 2015 through the distribution of 63
 64 surveys to medical professionals based in a number of LLMIC. Eligible 65
 66 survey participants were identified by contacting members of the 67
 68 authors' institutional networks who were based in LLMIC in Africa, 69
 70 South Asia, and Latin America by email and asking them to identify 71
 72 representatives of national gynecology, endocrinology, and diabetes 73
 74 professional societies. 75

76 All identified representatives of national professional societies were 77
 78 contacted by email and were asked to complete a questionnaire that 79
 80 contained multiple-choice questions on the availability of treatment 81
 81 and screening guidelines in their country; screening practices; the man- 82
 82 agement of patients with GDM, including treatment and monitoring; 83
 83 delivery and neonatal care; and postpartum follow-up. Representatives 84
 84 of national professional societies were also asked to forward a second, 85
 85 more detailed, questionnaire covering similar themes to gynecologists, 86
 86 endocrinologists, and medical doctors who were working at different 87
 87 levels in the healthcare system in their respective countries. Question- 88
 88 naires were distributed in English, French, Spanish, or Portuguese de- 89
 89 pending on the language spoken by the intended recipient. Returning 90
 90 the completed survey form by email was considered to indicate consent 91
 91 to participate in the study. Descriptive analyses were then performed on 92
 92 the data obtained from the completed questionnaires. The study was 93

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approved by the institutional review board of the Institute of Tropical Medicine, Antwerp, Belgium (973/14).

3. Results

Questionnaires were distributed to 182 individuals from 40 LLMIC; 77 participants from 26 LLMIC returned the questionnaires (Supplementary file S1). A selection of the key findings is presented in Fig. 1. Of the respondents, 45 (58%) were from African countries, 31 (40%) were from South Asian countries, and 1 (1%) was from Latin America (Fig. 2). Among respondents, 67 (87%) reported that their specialty was Obstetrics or Gynecology; 5 (6%) participants were Endocrinologists and 5 (6%) were non-specialized medical doctors. There were 16 (21%) participants who were representatives of national societies and 61 (79%) who were hospital-based clinicians.

Among the 61 hospital-based clinicians who participated in the present study, 36 (59%) were employed in the public sector, 21 (34%) in the private sector (including mission hospitals and non-governmental organizations), and 4 (7%) worked at both public and private facilities.

Guidelines for GDM screening and treatment were reported to be available by 52 (68%) respondents. Among the type of guidelines used, 9 (17%) participants used international guidelines, 16 (31%) reported using national guidelines, and 21 (40%) responded that they used protocols developed at their facility; 6 (12%) participants reported using both national/local and international guidelines.

Participants were asked about GDM-screening practices at their institutions; 33 (43%) individuals mentioned universal screening of all pregnant individuals and 26 (34%) participants reported screening of patients with risk factors; the remaining 18 (23%) participants indicated that screening was either not performed routinely, or was only performed if patients requested it.

Representatives of national societies were asked where screening occurred in their healthcare systems. Screening was reported to take place in tertiary-level hospitals by 13 (81%) participants and in private clinics by 12 (75%) respondents.

Individual risk factors that would prompt GDM screening are detailed in Fig. 3. The risk factors described as indications for GDM screening by the highest number of participants were a history of GDM, a history of macrosomia or macrosomia in the current pregnancy, obesity, and the presence of diabetes symptoms (Fig. 3).

When detailing the screening tests used in their setting, 22 (29%) respondents indicated that the 75-g oral glucose tolerance test was the only screening test applied at their facility; when including individuals

who reported the 75-g oral glucose tolerance test to be one of several screening methods, a total of 47 (61%) participants stated having access to it. A 50-g glucose challenge test was the only test available according to 4 (5%) survey participants. The tests with the highest availability are summarized in Fig. 4. The type of blood samples used for screening was reported by 74 (96%) participants, with 53 (72%) of these using venous samples, 8 (11%) using capillary blood, and the remaining 13 (18%) respondents screening using both capillary and venous blood samples in their setting.

Of the 61 hospital-based physicians, 59 (97%) provided answers regarding how their patients were managed following a GDM diagnosis. Of these 59 participants, 34 (58%) reported managing patients with GDM as outpatients and 23 (39%) indicated that patients diagnosed with GDM were hospitalized initially. The mean duration of hospitalization reported by these participants was 5.4 ± 2.88 days.

Data on how glucose levels were monitored following a GDM diagnosis were indicated by 76 (99%) participants. Self-monitoring was reported by 52 (68%) respondents; self-monitoring only was indicated by 27 (36%) survey participants and self-monitoring in combination with facility monitoring was reported by 25 (33%) respondents. Glucose monitoring was performed at healthcare facilities, private laboratories, or a mixture of the two according to 23 (30%) respondents. Only 1 (1%) participant included home visits by a health worker as a method to monitor glucose levels.

The intervals between follow-up appointments for patients with GDM were described by 74 (96%) survey participants. A follow-up interval of every 2 weeks was reported by 30 (41%) participants, 17 (23%) respondents indicated weekly follow-up, and 20 (27%) individuals reported monthly follow-up.

The 61 hospital-based respondents who completed surveys specified the recommended intervals between glucose tests. Daily glucose testing was advised by 37 (61%) clinicians, with 29 (48%) clinicians recommending between one and three glucose measurements each day. Testing schedules with weekly intervals were recommended by 17 (28%) hospital-based physicians, with 13 (21%) suggesting once-a-week testing.

Among all 77 survey participants, 74 (96%) recommended diet as the initial therapeutic step to manage GDM, and 58 (75%) reported advising patients to exercise to help control their GDM. Of the hospital-based physicians who returned questionnaires, 51 (84%) provided specific information on dietary recommendations following a GDM diagnosis; 33 (65%) clinicians suggested either avoiding or reducing sugar intake, 16 (31%) reported recommending eating more vegetables, and 14 (27%) participants

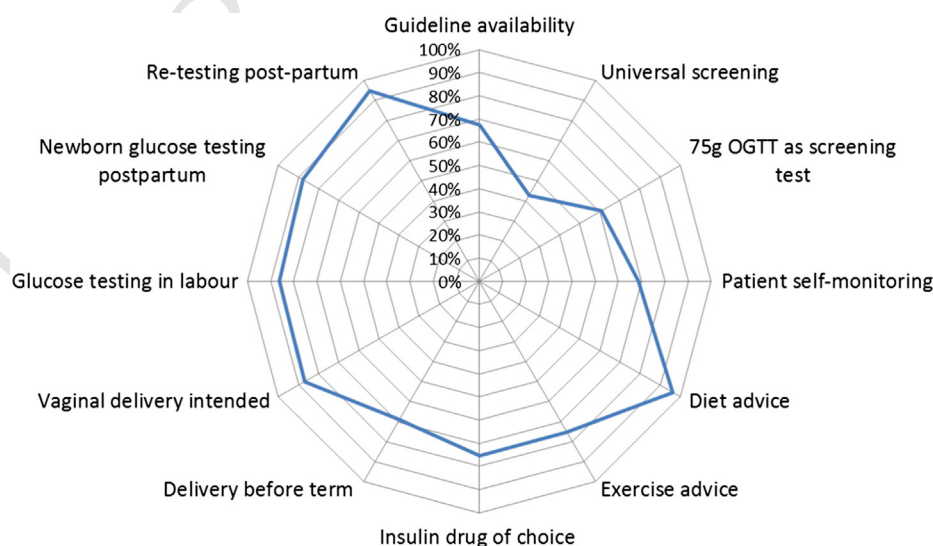


Fig. 1. Spider diagram of the incidence of selected GDM monitoring and treatment practices among study participants. Abbreviations: GDM, gestational diabetes mellitus; oral glucose tolerance test.

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