

Prevalence of Gestational Diabetes Mellitus in Homagama Divisional Director of Health Service area

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Abstract

Objective: To determine the prevalence of gestational diabetes mellitus (GDM) in the Homagama Divisional Director of Health Service (DDHS) area.

Methodology: Eight hundred and fifty three pregnant women were subjected to a two-hour 75 g Oral Glucose Tolerance Test (OGTT) at period of amenorrhoea (POA) of 24 – 28 weeks.

Results: The prevalence of GDM was 8.4%. the age standardized GDM prevalence was 10.3% [95% CI 7.3 – 13.4]. The prevalence of diabetes first detected during pregnancy was 1.2% and that of an impaired glucose tolerance (IGT) was 7.2%.

Conclusions and Recommendations:

Prevalence of GDM has increased among rural Sri Lankan pregnant women during the recent past. The majority (86%) of pregnant women with GDM belonged to the asymptomatic IGT category. This suggests the need for screening all pregnant women for GDM with a valid screening test during pregnancy instead of testing urine for reducing substances.

Key words: gestational diabetes mellitus, prevalence, impaired glucose tolerance, pregnancy

Introduction

Gestational Diabetes Mellitus [GDM] is defined as carbohydrate intolerance of variable severity, which occurs with the onset or first recognition during pregnancy¹. It is considered the most common metabolic complication of pregnancy, which is associated with a significant maternal and perinatal morbidity and mortality.

Despite the fact that GDM is a well-known disease entity showing a gradual rising trend

globally, its epidemiology has not been studied in a systematic manner. Hence, very limited standardized and comparative information is available globally as well as locally regarding the community prevalence of GDM.

Examination of the existing health statistics in Sri Lanka shows that there is a great paucity of accurate health information on the prevalence of GDM. The limited information available regarding this is based mainly on hospital based studies or routine government hospital statistics. Hospital based data are not comprehensive enough to assess the actual prevalence of GDM. The reasons for this are that the hospital records are often incomplete, only the mothers with clinical signs and symptoms of GDM seek treatment from hospitals and the catchments area of hospitals are sometimes ill-defined. Data based on population based studies would provide a reliable way to make an assessment of the prevalence of GDM.

Methodology

This study was conducted in the field practice area of the Homagama Divisional Director of Health Services [DDHS], situated in the administrative district of Colombo. It is classified as a rural area. DDHS Homagama is responsible for the provision of preventive health care to a population of 183,872 within its field area of 134 sq. km.

All pregnant women who were registered by Public Health Midwives (PHMs) in the Homagama DDHS area for antenatal care before 12 weeks of POA during the study period and who fulfilled the eligibility criteria were subjected to a 2-hour 75 g OGTT at POA of 24 – 28 weeks [n= 853]. It was assumed that the PHMs registered nearly all pregnant women permanently residing in the area. Before the commencement of data collection a community survey was conducted using a multistage cluster sampling technique to determine the proportion of pregnant women registered by PHMM in the Homagama DDHS area. The survey results revealed that the proportion of pregnant women registered by PHMs in the Homagama DDHS area was 98%. Women who were known diabetics, or on diabetogenic drugs at the time of registration, were excluded from the study. In this study, the capillary whole blood glucose estimation was done using the Accutrend Alpha® glucometer and the results were interpreted according to the World Health Organization (WHO) criteria for whole capillary blood¹.

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The sample size was calculated using the prevalence of glucose intolerance in women aged 20 – 44 years in suburban Sri Lankan community [8%] reported by a previous study². Five percent was added to the calculated figure to guard against the non-response and a further 10% added for loss of study subjects due to abortions before reaching 24 – 28 weeks of POA. The final calculated sample size was 1036.

An interviewer administered structured pre-tested questionnaire was used to collect information on basic demographic data and risk factors. Ethical clearance was obtained from the ethical review committee of the Faculty of Medicine, University of Sri Jayawardenapura.

Results

The study population was a predominantly Sinhala (98.8%). The mean age of the study population was 28.5 years (SD =5.43 years). Sixty one percent of subjects belonged to the age

group of 21 – 30 years and 9.6% of them were over 35 years. In this study sample, the majority of mothers (72.6%) had studied up to GCE (O/L) or above. Only 2.6% had either no formal education or had studied only up to Grade 5.

Nearly a half (54%) of the study population had a monthly total family income less than Rs. 7500. Only 8.3% of the families of respondents had a family income over Rs. 15,000. Of the 853 respondents, 72 had GDM giving a prevalence of 8.4% for the DDHS area Homagama. The age standardized GDM prevalence for the study population was 10.3% (95% CI 7.3 -13.4) or 103. The prevalence of GDM significantly ($p < 0.05$) increased with advancing age. The prevalence of GDM in the over 35 years age group (15.9%) was approximately five times higher than that of the below 25 years age group (3%).

Table 1. Age specific GDM prevalence in the study sample

Age group (Years)	Number with	Number without	Total (%)
	GDM (%)	GDM (%)	
< 25	7 (3.0)	224 (97.0)	231 (100.0)
25 – 34	52 (9.6)	488 (90.4)	540 (100.0)
> 35	13 (15.9)	69 (84.1)	82 (100.0)
Total	72 (8.4)	781 (91.6)	853 (100.0)

The state of impaired glucose tolerance (IGT) defined as the glycaemic response to a standard glucose challenge (75g glucose), which is intermediate between normal and diabetic curves, can be determined only by performing an Oral Glucose Tolerance Test. Results were interpreted according to WHO criteria. According to the WHO classification, mothers with GDM include both women with diabetes mellitus (DM) and IGT first detected during pregnancy. The prevalence of DM first detected

during pregnancy in the study population was 1.2% and the prevalence of IGT first detected during pregnancy was 7.2% (72 per 1000) for DDHS area Homagama. This indicates that in this population, the prevalence of IGT was six times higher than that of DM. The age standardized DM prevalence of this population was 1.5% (95% C.I. 0.3 – 2.7).

The age standardized IGT prevalence of this population was 8.8% (95% C.I. 6 – 11.6)

Table 2. Age specific diabetes mellitus and impaired glucose tolerance in the study sample

Age group (Years)	Number with DM (%)	Number with IGT (%)	Number without GDM (%)	Total (%)
< 25	1 (0.4)	6 (2.6)	224 (97.0)	231 (100.0)
25 – 35	7 (1.3)	45 (8.3)	488 (90.4)	540 (100.0)
> 35	2 (2.4)	11 (13.4)	69 (12.8)	82 (100.0)
Total	10 (1.2)	62 (7.2)	781 (91.6)	853 (100.0)

The age standardized DM prevalence - 1.5% (95% C.I. 0.3 - 2.7)

The age standardized IGT prevalence - 8.8% (95% C.I. 6 - 11.6)

Discussion

According to the WHO *ad hoc* Diabetes Reporting Group reported the DM and IGT statistics for rural Sri Lankan women in the reproductive age group in 1987³, the prevalence of DM and IGT was 0% and 3.1% respectively, adopting WHO criteria. The present study (2003) reveals a prevalence of 1.2% DM first detected during pregnancy and 7.2% of IGT in this population of rural pregnant women in the Homagama DDHS area. When we compare the results of the above studies, the prevalence of both DM (from 0% to 1.2%) and IGT (from 3.1% to 7.2%) has increased among the rural Sri Lankan pregnant population during the last sixteen years. In other words, GDM (DM & IGT) prevalence has increased among rural Sri Lankan pregnant women during the last sixteen year period from 3.1% to 8.4%.

Another community based study done by Siribaddana et al² among suburban reproductive age women (n=597) reported the prevalence of glucose intolerance as 8.1% (DM – 3% & IGT – 5.1%). This prevalence rate is more or less similar to the current study prevalence (8.4%). By considering the fact that the previous study was done about 8 years ago among the reproductive age females, one would have expected a higher prevalence of GDM during the current study. One explanation for this may be that the previous study population included already diagnosed cases of DM, although in this study we excluded mothers who were already diagnosed as DM or IGT (accordance with the GDM definition). At the same time in the previous study sample nearly 40% of study subjects were over 35 years of age compared to nearly 10% in the present study.

Another important observation of this study results is that 86% of the women who were diagnosed as having GDM belonged to the IGT category. Those women with IGT do not usually have obvious clinical signs and symptoms suggestive of GDM. But it has been proven that increasing maternal carbohydrate intolerance in pregnant women even without GDM is associated with a graded increase in adverse maternal and fetal outcomes⁴.

This study was done in a selected DDHS area, so the study findings cannot be generalized to the whole country. However, it might give some preliminary insight into the rising prevalence of GDM in the whole country.

Conclusions and Recommendations

Prevalence of GDM has increased among rural

Sri Lankan pregnant women during the recent past. The majority of pregnant women with GDM belonged to the asymptomatic IGT category. This suggests the need for screening of all pregnant women for GDM with a valid screening test during the pregnancy instead of testing urine for reducing substances as is the current practice.

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