BASIC SCIENCES AND PRECONCEPTION

Gestational diabetes mellitus in South Asia: Epidemiology

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Abstract

Gestational diabetes mellitus, is defined by the American Diabetes Association as "diabetes diagnosed in the second or third trimester of pregnancy that is not clearly overt diabetes".

WHO has further classified the period of diagnosis as Hyperglycaemia in Pregnancy and Gestational Diabetes Mellitus. The former term is applicable in the early period of gestation and GDM is detected after 24 weeks.

Irrespective of the guidelines followed, the presence of Diabetes Mellitus during pregnancy, has to be taken seriously as it is an important metabolic derangement and can prove to be harmful for the mother and dangerous for the foetus. The rising incidence of Type 2 Diabetes Mellitus in the world along with obesity, is a major contributing factor for GDM. The trend of this rise is more steep in the low and middle income countries thus proportionately increasing the risk for GDM. South Asia falls in this bracket and the responsible factors have to be identified and corrected.

Management should begin from primordial prevention for which education is a key factor. Every woman should be taught the way to follow a healthy life style. Identification of the contributing factors and universal screening facilities for all pregnant women living in both rural and urban areas, should be given prime importance. On detecting Hyperglycaemia in Pregnancy or GDM, monitoring and health care facilities should be provided.

This review provides some available figures of GDM in South Asia, the risk factors in this population and the steps for prevention.

Keywords: South Asia, Diabetes, Gestational, HIP.

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Introduction

The rising figures of Diabetes Mellitus in the world has given it the form of an epidemic. Currently there are 415 million people worldwide with Diabetes. This amounts to 10.7% of the adult population. The prevalence figures are expected to escalate to 642 million or 11.1% of the world population by 2040. Eighty percent of these people will be living in countries belonging to the Low and middle income groups. It is also observed that majority of the people with diabetes are between the ages of 40 and 59 years.[1] The figures of high blood glucose (HIP) in pregnancy universally have been quoted as 30.9 million which amounts to one in 7 births.[1] In South Asia one quarter of all births are affected by HIP.[1]

The history of GDM dates back to 1824 when Dr. Bennewitz recorded the first case of diabetic pregnancy in Berlin. The patient, a 22 year old housewife came in with severe thirst and excess urine in her fourth pregnancy. It was a difficult obstructed delivery of a 12 pound still born male child.[2]

Previously, Gestational Diabetes Mellitus was defined as Glucose intolerance first diagnosed during pregnancy. Recently, the World Health Organization proposed new criteria for the diagnosis and definition of hyperglycaemia first detected in pregnancy (HIP).[3] Diabetes first detected in Pregnancy (DIP) has been demarcated from GDM. The former is likely to persist after delivery whereas GDM is a milder form usually reverting after childbirth.[4]

ADA has adopted a revised definition, which extrapolates GDM as "Diabetes diagnosed in the second or third trimester of pregnancy that is not clearly overt diabetes".[5]

Global and Regional Epidemiology

Prevalence of GDM has a wide range across the globe. It varies according to the tools used for assessment as well as in different populations.[1] According to International Diabetes Federation, globally 85.1% cases of hyperglycaemia in pregnancy are due to GDM.[1] Around

the world, 1 in 7 births is affected by GDM.1According to an Australian study, Asian women are at increased risk of having GDM compared to their Australian counterparts (11.5% vs 3.7%). Rates are highest in the regions of Middle East and Asia.[6]

Over 91.6% of cases of HIP occur in low- and middle-income countries. with the highest age standardised prevalence of HIP being in lower middle income countries at 17.6% followed by low-income countries at 14.5%.[1]

It is estimated that by 2035 there will be a 150% rise in rates of T2DM in South Asia.[7] Among countries included in South Asia, risk profile for GDM varies according to location and culture. Every pregnant woman from South Asia should be dealt according to where they were born and currently living, as rates can vary consequently.[8,9]

Within the region of South Asia, the highest incidence rate has been noted in Indian women.[10] In the last decade, community-level study reports the prevalence of GDM as 13.9% in Indian pregnant women.[11] With the latest World Health Organization (WHO), guidelines, it is 35%.[12] However, one has to acknowledge that most of the countries in South Asia have not conducted studies to document GDM incidence and prevalence rates. Countries where reliable studies have not been conducted can have underestimated rates.

In 2012, 14.5% women from Bahawalpur, Pakistan were diagnosed with GDM. Of these, 22.58% were obese as opposed to 6.45% non-obese women.[13] Table-1 shows the comparison of disease rates within South Asia region.[10,13-17] Rates for Bhutan could not be found. Also, rates varied according to the guidelines used to define GDM. Rates calculated using WHO guidelines are tabulated for better comparison.

No country wide surveys for acquiring the prevalence of GDM have been conducted in the South Asian region. The data available from some of the South Asian countries are alarming.[6]

Table-1: Comparison of disease rates in South Asia region.

Country	Year of Study	Disease Rates (%)	Risk Ratio (95%CI)
Afghanistan		1.4[14]	2.8(2.3-3.3)
Bangladesh	2012-2013	9.7[15]	7.1(6.8-7.3)
India	2014	35[10]	3.7(3.5-3.9)
Maldives		10.6[10]	
Nepal	2009-2010	0.75[I 16]	
Pakistan	2012	14.5[13]	4.6(4.3-4.8)
Sri Lanka	2010	7.2[17]	

I: incidence

Table-2: Prevalence figures of three South Asian countries.[6]

Country	Female population between 20-49 years in 1000s	Cases with HIP in 1000s	Crude Prevalence
Bangladesh	2544.3	248.2	9.8%
India	24,055.9	5995.3	24.9%
Sri Lanka	369.8	47.9	12.9%

Table-3: Extrapolated Incidence of GDM in SA.[18]

Country	Extrapolated Incidence	Population Estimated Used
Afghanistan	14,152	28,513,6772
Bangladesh	70,150	141,340,4762
Bhutan	1,084	2,185,5692
India	528,619	1,065,070,6072
Pakistan	79,012	159,196,3362
Sri Lanka	9,879	19,905,1652

The figures of the female population in 1000s between 20 to 49 years, cases with HIP in 1000s and the crude prevalence of Bangladesh, India and Sri Lanka are shown in Table-2.

In the absences of actual figures of GDM in South Asian countries, extrapolated incidence rates have been calculated.[18] Although they have limited relevance to actual rates they provide an overview (Table-3).

Risk Factors for GDM-Cause for rise of HIP in Pregnancy in South Asia

These can be assumptions as no country wide survey has been conducted in the region. There is a high prevalence of DM with a lower age at diagnosis. Consanguineous marriages are a common practice, which doubles the risk of inheriting the disorder due to a family history of diabetes and multigravidity are frequently encountered. Lifestyle has changed over the years leading to an increase in the incidence of obesity. The tendency in the women of this region is to have more visceral or central fat, which is a known risk factor for insulin resistance and cardiovascular disease.[19]

The education level is low which leads to lack of health awareness and adoption of an unhealthy lifestyle, eventually causing an increase in the incidence of obesity.

The other well-documented risk factors for GDM include advanced maternal age, family history of diabetes, previous GDM, having a macrosomic baby, non-Caucasian race/ethnicity, being overweight or obese and cigarette smoking, which are all prevalent in the region.[20,21] Disease rates of GDM is a reflection of impaired glucose tolerance

in young fertile female age group from a given population.[22]

These factors together contribute to the rising incidence of Type 2 Diabetes in South Asia and further to acquiring GDM by the females.

Prevention of GDM and HIP

Awareness has to be created among women of the reproductive age, on acquiring a healthy life style and preventing obesity, more so central obesity.

Lifestyle intervention thus is the foremost tool to first prevent and later if required to treat GDM. This has to be implemented preferably before pregnancy or in early pregnancy to avoid complications. Large observational studies have given promising results when the intervention was introduced early in both cohorts. It is also well established that insulin resistance is present in obese subjects and weight reduction improves insulin sensitivity.[23-25]

For early diagnosis of GDM or HIP and its management, universal screening should be implemented in early pregnancy in all women.

Conclusion

South Asian women have a higher risk of developing GDM. With regards to GDM epidemiology there should be one uniform guideline which should be drafted and adopted by all countries. Regions with no authentic studies should consider starting with prevalence studies if not cohort studies for incidence rates.

Universal screening of pregnant women and implementing necessary intervention will provide good outcomes and protect maternal health.

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