

# Study shows patients benefit most from gestational diabetes mellitus screening

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A local research study conducted by KK Women's and Children's Hospital (KKH) and Duke-NUS Graduate Medical School (Duke-NUS) has found that pregnant patients benefit most from gestational diabetes mellitus (GDM) screening as it allows for timely interventions and brings about health benefits that far outweigh the cost. The study supports offering screening of GDM for all pregnant women, and corroborates with the recent recommendations of several international studies in other developed countries calling for screening of GDM in all pregnant women.

As a result of the local study, from 1 January 2016, KKH will be starting a six-month pilot trial offering GDM screening in the form of the oral glucose tolerance test (OGTT) to all pregnant patients at 24 to 28 weeks gestation. This will help achieve better [health outcomes](#) for all pregnant patients through early detection and intervention.

## **GDM - an increasing health risk for pregnant women**

According to the International Diabetes Federation, the prevalence of GDM in women worldwide is about 15 percent. This figure is expected to rise in the next decade. Studies have also shown that Asian women are at greater risk of developing GDM during their pregnancies, and that GDM increases the health risks for mothers and their babies. Their babies are at higher risk of being big babies weighing more than four kilogrammes at birth, and may also suffer shoulder dystocia (obstructed

labour where the shoulders cannot pass through the vagina), birth trauma, and lack of glucose in the bloodstream, which can lead to long-term negative health effects. During pregnancy, the mother may develop high blood pressure, go into preterm labour, and may require a caesarean section. GDM is also associated with increased risk of both mother and fetal deaths.

Currently, KKH offers targeted GDM screening to high-risk pregnant women. A pregnant woman who is at high-risk for GDM is identified as having any of the following:

- a high body mass index
- first-degree relatives with diabetes
- a personal history of previous GDM or large babies of more than four kilogrammes
- previous poor obstetric outcomes usually associated with diabetes
- age 35 and above
- two episodes of consecutive glycosuria (sugar in urine)

Once identified, high-risk pregnant women are offered the OGTT at 24 to 28 weeks gestation. This test involves two blood samples to be drawn, one blood sample will be taken before the pregnant woman drinks a flavoured sweet drink and another taken from her two hours after the drink. Both samples will be sent for laboratory testing to determine the level of glucose in the blood. Women who are diagnosed with GDM will be followed up promptly with counselling to help them to monitor and better manage their condition.

## **KKH - leading efforts to improve health outcomes in women and children**

As part of the hospital's ongoing efforts to enhance patient care, KKH

and Duke-NUS jointly conducted a local study to analyse and compare the patient benefits of routine GDM screening against targeted GDM screening, and no GDM screening at all for pregnant patients, using the GUSTO\* database - a birth cohort of 924 pregnant women who completed their entire pregnancy in 2009 and 2010, and additional data from the hospital and world literature. The study found that routine GDM screening is a cost-effective approach to reduce the complications of GDM in Singapore, compared to the targeted screening or no screening approach.

As part of KKH's six-month pilot trial to offer GDM screening to all pregnant patients at 24 to 28 weeks gestation from 1 January 2016, the hospital will also be adopting the International Association of Diabetes and Pregnancy Study (IADPSG) criteria, as it is a more sensitive screening marker of OGTT criteria for GDM. IADPSG criteria is based on data evidence from international HAPO (The Hyperglycemia and Adverse Pregnancy Outcome) study of which KKH was one of the 15 participating centres in the world. These changes by the hospital will help to enhance patient care as pregnant women who develop GDM can be promptly identified and provided with timely interventions for better health outcomes.

Professor Tan Kok Hian, the principal investigator of the study, who is also Head and Senior Consultant, Perinatal Audit and Epidemiology Unit, Division of Obstetrics and Gynaecology, KKH, said, "There are many risks for the mother and baby which highlight the importance of proper screening and treatment for women at risk of GDM. Medical interventions for GDM patients reduce complication rates by as much as 40 percent, giving both the mother and her baby a better prognosis in the long-term. This local study has validated what other international studies have shown, which is that GDM screening for all pregnant women is key to better detection rates and optimum management of GDM in pregnant women."

Professor Eric Finkelstein from the Health Services and Systems Research Programme, Duke-NUS, said, "As a researcher focusing on economic causes and consequences of health behaviours, this study finding is significant as it will influence the GDM screening practice not only locally but also regionally, improving the health outcomes of many [pregnant women](#) and their children."

Dr Petty Chen, currently a SingHealth Postgraduate Year One doctor, conducted the study as part of her third and final-year student research project in Duke-NUS. She was mentored by Professor Tan and Professor Finkelstein for the study. She said, "This study uses local data from KKH and GUSTO to look at the cost-effectiveness of routine, target and no screening strategies. The result favoured routine screening as the most optimal screening strategy in Singapore where GDM rates are high, and treatments are very effective to achieve good outcome."

Singapore General Hospital, a member of SingHealth, and part of the SingHealth-Duke NUS OBGYN Academic Clinical Programme and SingHealth-Duke NUS Academic Medical Centre, will also be embarking on the six-month pilot trial from 1 January 2016 to offer GDM screening to all pregnant patients in their 24 to 28 weeks gestation using the IADPSG [screening](#) criteria.

\* GUSTO (Growing Up in Singapore Towards healthy Outcomes) is a major and very detailed long-term study of pregnant Singaporean mothers and their offspring from birth till nine years of age. The study aims to find ways of preventing the onset of diseases in later years. Backed by mounting evidence that the environment in which a baby is conceived, born and grows up, determines the child's growth and development, KKH, and the National University Health System (NUHS) partnered A\*STAR's Singapore Institute for Clinical Sciences (SICS) to study and better understand just how profoundly genetic and environmental factors affect neurodevelopment as well as the

development of metabolic diseases like diabetes and obesity. All GUSTO babies were delivered in KKH and NUH, with more than 80% of the deliveries in KKH. GUSTO is supported by the National Research Foundation (NRF) Singapore under its Translational and Clinical Research (TCR) Flagship Programme and administered by the Singapore Ministry of Health's National Medical Research Council (NMRC).

**More information:** P. Y. Chen et al. Incremental Cost-Effectiveness Analysis of Gestational Diabetes Mellitus Screening Strategies in Singapore, *Asia-Pacific Journal of Public Health* (2015). [DOI: 10.1177/1010539515612908](https://doi.org/10.1177/1010539515612908)

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