

Gestational Diabetes Mellitus: A Public Health Approach

Dr. Vitull K. Gupta MD (Medicine), FICP, Dr. Varun Gupta, Meghna Gupta (MBBS Final Year Student), Kishori Ram Hospital and Diabetes Care Centre, Bathinda.

As India completes 68 years of independence, there is no doubt about progress in the health status of its population, but still India is far from reaching the desired goal of health for all. However, over the past few decades, the country has experienced major transitions in economic development, nutritional status, fertility and mortality rates consequently accelerating the rise in the prevalence of chronic non-communicable diseases (NCDs). So India is now struggling to manage a “double burden” of non-communicable and communicable diseases necessitating a national public health care policy to combat both. A comprehensive strategy for the prevention and control of NCDs including Gestational Diabetes Mellitus (GDM) must integrate public health approach to minimize risk factor exposure of the population and individuals at high risk.

What is Public Health?

Public health is “the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals”. The dimensions of health can encompass “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”, as defined by the United Nations’ World Health Organization. Modern public health practice requires multidisciplinary teams of professionals. A public health approach embodies a systems perspective, containing the continuum of prevention and control, from determinants to care among the three levels of action that is population-wide policies, community activities, and health services.

Public Health in India

Mahatma Gandhi proclaimed India’s ideal in 1940: “We

should no longer be guilty of the neglect of the health of our people.” But a few nations have addressed the health needs of their people with such callousness and contempt as India is doing. Our health care system experiences severe strains and is in shambles or in crisis. Several articles write of “virtual collapse”, “advanced state of decay”, or “deteriorating state”. S.G. Vombatkere writes: “Naming what exists a ‘health care system’ may not be accurate because it largely concerns the management and treatment of sickness and disease rather than health, and merely attempts to restore the patient to a state of absence of disease, not to vibrant good health”. The NHP-2002 describes the prevailing situation as: “The existing public health infrastructure is far from satisfactory.” Public Health Care in India faces a crisis unmatched by any other sector of the economy because our planners and policy makers developed the secondary and tertiary care sector, ignoring public health care completely. Thus today we have well developed city hospitals and a massive medical education infrastructure, which mainly produces doctors for the market. It is not lack of resources but absence of political commitment, ever increasing corruption, lack of transparency and more importantly absolute lack of accountability that plagues public healthcare in India. The nation still spends less than one per cent of the GDP on this sector.

Diabetes and GDM on overview:

Diabetes mellitus, long considered a disease of minor significance to world health, is now taking its place as one of the main threats to human health in the 21st century. The past two decades have seen an explosive increase in the number of people diagnosed with diabetes worldwide. Its incidence is increasing rapidly, and it is projected that the number of diabetes deaths will double

by the year 2030. Editorial in the *The Lancet*, opined that “The fact that type 2 diabetes, a largely preventable disorder, has reached epidemic proportion is a public health humiliation”.

The concern is that India would be having the highest population of diabetes by 2025.⁹ GDM is seen in approximately 1 to 14% of pregnancies depending on the population studied.¹⁰ In presence of paucity of data on GDM it is reasonable to conclude increased prevalence of GDM in Indian population. Therefore, the public health aspects of increasing prevalence of GDM need more attention.

GDM: A Public Health Concern

Over the next 2 to 3 decades 20 million reproductive age women with diabetes will live in India alone creating a potential for extremely high rates of maternal and infant morbidity. Exposure to a diabetic environment in utero is associated with increased occurrence of impaired glucose tolerance (IGT), a defective insulin secretory response in adult offsprings, a direct effect on development of fetal pancreas and is associated with increased susceptibility to future diabetes in the infant, an effect which is independent of genetic factors.¹¹

The “fetal origin of disease” hypothesis proposes that gestational programming may critically influence adult health and disease, and predispose individuals to disease in adult life. Moreover, increasing maternal carbohydrate intolerance in pregnant women without GDM is associated with a graded increase in adverse maternal and fetal outcomes. The best preventive measure is primary prevention and for primary prevention of type 2 DM, preventive measures should start during intrauterine period and continue throughout life from early childhood.

The health care system will require increased resources to manage appropriate glycemic control during pregnancy and reduce adverse perinatal outcomes. As about 50% of women with GDM are expected to develop type 2 diabetes within 5 years of the index pregnancy¹² so improved health behaviors at postpartum visits is necessary to prevent development of diabetes and recurrent GDM. As reported in a survey, only 62% of the American College of Obstetrics and Gynecology members believed that women with GDM were at increased risk of diabetes. GDM is a grave public health concern as it play a crucial role in the increasing prevalence of diabetes and obesity.

Infants of women with GDM or diabetes are at increased risk of developing obesity, impaired glucose tolerance, and diabetes as children or young adults,^{13, 14} and the increased risk may be independent of genetic factors. This fact should alert physicians about the necessity to devote special attention to this segment of population especially in developing countries. All these factors necessitate to consider Public health approach to prevent, diagnose and control ever increasing threat of GDM in India.

GDM: Public health approach

An overview

The healthcare system in India is in the process of being re-oriented towards Corporatisation and privatization. Individuals belonging to higher echelons of society having access to the best possible evidence based care in tertiary hospitals and the poor lacking access to even basic care, resulting in their illnesses being either undetected or inadequately treated leading to avoidable complications, premature mortality and disability. In 2007, a National Programme on Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke (NPDCS) was launched on a pilot basis in ten states with the objectives of assessment of the prevalence of risk factors for NCDs (diabetes, CVD and stroke), to reduce the risk factors for developing NCDs; and provide early diagnosis and appropriate management. It has been renamed as the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) which is expected to cover all the states and union territories in the 12th Five Year Plan. More importantly it does not lay stress on GDM meaning that we in India does not have any public health care national programme focusing GDM.

Public health strategies for GDM

A comprehensive strategy for the prevention and control of GDM must integrate proven and effective public health interventions to minimize risk factor exposure at the level of the population and reduce risk of disease related events in individuals at high risk. Such a combination of the population approach and the high risk approach is synergistically complementary, cost-effective, and sustainable; and provides the strategic basis for early, medium and long term impact on GDM in India. Organization of Diabetes in Pregnancy Study Group India and issue of Indian Guidelines for management of GDM is a concrete step forward to educate, motivate and

provide a stable platform for the consultants to strive for excellence in providing evidence based GDM care.

Essential components of public health strategies are:

- Positioning GDM as a priority and maximizing political opportunities.
- Building regular surveillance systems.
- Creating an evidence base.
- Coordination of NCD initiatives and integration into other national programmes.
- Strengthening the health system.
- Establishing referral and follow-up systems.
- Development and implementation of GDM clinical standards and guidelines.
- Providing patient education and enabling self-care and management.

Public health approach to improve pregnancy outcomes among women with GDM should include:

- Development and implementation of GDM specific guidelines.
- Screening of women to detect gestational diabetes.
- Identification of women with established diabetes who may become pregnant.
- Ensuring of appropriate care for women with diagnosed diabetes (either established or gestational) with appropriate patient education and nutrition counseling, on-site or through referral.
- Postpartum follow-up and continuing care of women with established diabetes to maintain good blood-glucose control before pregnancy and throughout subsequent pregnancies and neonatal follow-up.
- Postpartum follow-up of women with gestational diabetes to detect previously undiagnosed established diabetes, to monitor the maintenance of ideal body weight to reduce the chance of developing diabetes later in life, and to ensure prompt diagnosis of diabetes if and when it develops.
- Increasing provider awareness through professional education.

Conclusion

Given the enormous but not insurmountable challenge posed by the escalating burden of diabetes and GDM, strong public health action and commitment to implementing proven and effective interventions is

required. In the milieu of a resource constrained public health system, a combined strategy, incorporating interventions targeted at the whole population as well as those focused on individuals at high risk of developing GDM and those with established diabetes, will help reverse the rising tide of diabetes and GDM in India. Strategic directions are needed for comprehensive action on GDM with a focus on health development in all policies, community-wide primary prevention programs, accessible services for the prevention of diabetes and GDM in individuals at increased risk, accessible services for the optimal early detection and management of GDM, integrated care for females with GDM, qualified and motivated workforce, enhanced surveillance system and research and evaluation and knowledge exchange. Multidisciplinary coordination of services must be person centered, incorporate prevention and self-management, and be responsive to changing patient needs. More importantly political will and commitment is critical for revitalization of commitment to public health care and the challenge is to marshal and organize potential support in ways that are practical, effective and sustainable in a pursuit to prevent, control and treat GDM. The question here is whether this is possible under the present health care system which is increasingly being privatized and corporatised. I strongly feel that solutions to manage GDM can't be isolated from other NCDs plaguing India which will definitely require a complete overhaul of the existing health care system, global vision and local actions keeping in mind health care needs of local people who must shape the local solutions. What India needs now is enthusiastic involvement of all stakeholders to make public health care system responsive to needs of the people of India, both rich and the poor.

References

- Winslow, Charles-Edward Amory (1920 Jan 9). "The Untilled Fields of Public Health". *Science* 51 (1306): 23–33. doi:10.1126/science.51.1306.23
- Frequently asked questions from the "Preamble to the Constitution of the World Health Organization" as adopted by the International Health Conference, 1946
- Joint Task Group on Public Health Human Resources; Advisory Committee on Health Delivery & Human Resources; Advisory Committee on Population Health & Health Security (2005). *Building the public health workforce for the 21st century*. Ottawa: Public Health Agency of Canada.
- *Health Care in India Today*. 1, *Integral Liberation* Vol. 12, No. 1 April 2008
- *Public Health Care System – Why a Failure*: Health Action: 2007: December
- *National Health Policy – 2002 (NHP-2002)*, Govt. of India (GOI),

- 2002, Dept. of Health, New Delhi.
- Zimmet, P. Globalization, coca-colonization and the chronic disease epidemic: can the doomsday scenario be averted? *J. Intern. Med.* 247, 301–310 (2000).
 - Amos, A., McCarty, D. & Zimmet, P. The rising global burden of diabetes and its complications: estimates and projections to the year 2010. *Diabetic Med.* 14, S1–S85 (1997).
 - Hilary King, Ronald E. Aubert, William H. Herman. Global burden of diabetes 1995–2025. *Diabetes Care* 1998; 21:1414–31.
 - World Health Organization. Diabetes Fact Sheet N°312, January 2011.
 - The Lancet editorial board. “Type 2 diabetes—time to change our approach.” *The Lancet*, 375(9733): 2193
 - Expert Committee on the Diagnosis and Classification of DM: *Diabetes Care* 26 (Suppl. 1):S5–S20, 2003.
 - ADA: Gestational diabetes mellitus (Position Statement). *Diabetes Care* 27 (Suppl. 1):S88–S90, 2004.
 - Assiamira Ferrara: Increasing Prevalence of Gestational Diabetes Mellitus. *Diabetes Care*, Vol 30, Supplement 2, July 2007
 - Ravinder Madan Chair of the S. East Asian region IDF – 17th IDF congress, Mexico 2000
 - Dornhorst A, Beard RW. Gestational diabetes a challenge for the future. *Diabet Med* 1993;10:897-905.
 - Jarrett RJ. Gestational diabetes. *Diabet Med* 1994;11:992-3.
 - Barker DJ. Fetal origins of coronary heart disease. *BMJ* 1995; 311:171–4.
 - Lucas A. Programming by early nutrition in man. In: Bock GR, Whelan J, editors. *The childhood environment and adult disease*. Chichester (UK): John Wiley and Sons; 1991. p. 38–55.
 - Sermer M, Naylor CD, Farine D et al. The Toronto Tri Hospital Gestational Diabetes Project – A preliminary review. *Diabetes Care* 1998; 21 Suppl 2, B33–42.
 - Crowther CA, Hiller JE, Moss JR, McPhee AJ, Jeffries WS, Robinson JS: Effect of treatment of gestational diabetes mellitus on pregnancy outcomes. *N Engl J Med* 352:2477–2486, 2005.
 - Kim C, Newton KM, Knopp RH: Gestational diabetes and the incidence of type 2 diabetes: a systematic review. *Diabetes Care* 25:1862–1868, 2002
 - Montana Department of Public Health and Human Services Chronic Disease Prevention and Health Promotion Program: Trends in Pregnancy Among American Indian and White Mothers in Montana 1989–2003. April to June 2005, 1–8, 2005
 - Pettitt DJ, Baird HR, Aleck KA, Bennett PH, Knowler WC: Excessive obesity in offspring of Pima Indian women with diabetes during pregnancy. *N Engl J Med* 308:242–245, 1983
 - Silverman BL, Rizzo TA, Cho NH, Metzger BE: Long-term effects of the intrauterine environment: the Northwestern University Diabetes in Pregnancy Center. *Diabetes Care* 21 (Suppl. 2): B142–B149, 1998
 - Pettitt DJ, Aleck KA, Baird HR, Carraher MJ, Bennett PH, Knowler WC: Congenital susceptibility to NIDDM: role of intrauterine environment. *Diabetes* 37:622–628, 1988
 - Dabelea D, Hanson RL, Lindsay RS, Pettitt DJ, Imperatore G, Gabir MM, Roumain J, Bennett PH, Knowler WC: Intrauterine exposure to diabetes conveys risks for type 2 diabetes and obesity: a study of discordant sibships. *Diabetes* 49:2208–2211, 2000
 - Avi Ben Haroush, Yariv Yogeve, Moshe Hod. Epidemiology of gestational diabetes mellitus. In: Moshe Hod, Lois Jovanovic, Gian Carlo Di Renzo, Alberto de Leiva, Oded Langer (eds) *Textbook of Diabetes and Pregnancy*. 1st ed. London: Martin Dunitz, Taylor & Francis Group plc; 2003:64–89.
 - Patel V, Chatterji S, Chisholm D, Ebrahim S, Gopalakrishna G, Mathers C, Mohan V, Prabhakaran D, Ravindran RD, Reddy KS. Chronic diseases and injuries in India. *Lancet* 2011;377:413–28.
 - Prabhakaran D, Ajay VS. Non-communicable diseases in India: A perspective. World Bank 2011. In Press

***Remember, no human condition is ever permanent.
Then you will not be overjoyed in good fortune nor too
scornful in misfortune.
— SOCRATES***