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SHORT COMMENTARY

Pregnancy and the Formative Fifteen of Diabetes

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About the Author

Navneet Magon is a doctor by design, a gynecologist, endoscopic surgeon by desire, and an obstetrician by passion; he is presently working with the Indian Armed Forces. Ardently involved with academics, he is presently the National Coordinator for FOGSI Medical Disorders in Pregnancy Committee, FOGSI Foods & Drugs Committee as well as FOGSI Urogynecology Committee. He has over 50 peer-reviewed publications to his credit, is on the Editorial Board of many national and international journals, and is a member of the World Association of Medical Editors (WAME). Gestational Diabetes is one of the key areas of his work interest, and he is part of the core group and one of the authors of the latest Indian guidelines on diagnosis and management of GDM.

Defronzo's "Ominous Octet" of diabetes [1] has been suggested to be expanded to "The dirty dozen of diabetes" or the treacherous thirteen [2]. As the science behind the etiopathogenesis of diabetes unfolds, there would be many more added to this. We propose adding another two here.

We would like to draw attention to a very important aspect, pregnancy, which seems to have skipped attention.

Insulin resistance in muscle and liver, and β-cell failure represented the core triumvirate of diabetes initially, to which fat cell (accelerated lipolysis), gastrointestinal tract (incretin deficiency/resistance), α-cell (hyperglucagonemia), kidney (increased glucose reabsorption), and brain (insulin resistance) were added because of their roles in the development of glucose intolerance. Collectively, these eight comprised the ominous octet, famously described by Ralph A. DeFronzo in his Banting lecture [1]. Now, the Dirty Dozen includes catecholamines, vitamin D, RAS, and testosterone, to the list and addition of iron may expand it to the Treacherous Thirteen [2].

We propose that pregnancy must be included in the list. It shall add two independent and separate players: one, intrauterine exposure to a diabetic pregnancy and, second, exposure to a pregnancy itself for a woman. The "intrauterine exposure to an uncontrolled diabetic pregnancy" should be the "forbidden fourteenth", in that intrauterine fetal exposure to uncontrolled state of diabetes predisposes to diabetes in adult life, and this should be forbidden by ensuring strict glycemic control in women whose pregnancies are complicated by diabetes. Since pregnancy is a state of progressively increasing insulin resistance, inclusion of "pregnancy" as a player in the list of factors responsible for development of glucose intolerance

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expands this list to fifteen, which can then be collectively rechristened as "Formative fifteen of diabetes" till new additions come in.

Pregnancy causes a state of increased insulin resistance and predisposes a woman to a diabetogenic state. Thus, it becomes a risk factor for the development of diabetes (may be transient) in a woman who may be predisposed to developing diabetes. Indeed, it turns out to be a much greater contributor to the overall risk of diabetes that in a diabetic pregnancy further predisposes its intrauterine product also to the future risk of pregnancy [3].

Undoubtedly, individuals ordained to develop type 2 diabetes inherit a set of genes that make their tissues insulin resistant, and the role of maternal inheritance in diabetes has been reported in many epidemiological studies [4]. But, at the same time, studies have also indicated that intrauterine exposure to a diabetic environment increases the risk of diabetes and obesity beyond that attributable to genetic factors alone [5].

Therefore, adding pregnancy-related factors to the list of players contributing to risk of development of diabetes would bring the much-needed focus to this very important issue. This can help plan appropriate interventions at an appropriate time to help decrease the risk of diabetes. Focusing pregnancy as a risk factor for diabetes shall encourage universal screening of all pregnant women for diabetes. Further, it would help appropriate management in women found diabetic during pregnancy to provide an optimal intrauterine milieu to the fetus so as to prevent the ill effects of maternal hyperglycemia, and its consequent risk of development of diabetes in future life. Additionally, the women who shall be diagnosed only with gestational diabetes can be counseled to carry on with life-style modifications and life-long screening program so as to prevent diabetes or at least to diagnose it early for better management and prevention of morbidity.

Inclusion of pregnancy-related factors in the list of players having role in development of diabetes shall help two generations: one by promoting preventive strategies/early detection of diabetes in the present generation and second by reducing the incidence of type 2 diabetes mellitus in later generations [3].

Conflict of interest The authors, Navneet Magon and Monica Chauhan declare that they have no conflict of interest.

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