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LETTER TO THE EDITOR

Nutrition interventions and clinical outcomes of pregnant women with gestational diabetes mellitus: More than meets the eye

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Abstract

In the retrospective study by Luo *et al* regarding clinical outcomes in gestational diabetes mellitus (GDM), the results are statistically significant in favour of the benefits of individualized nutrition interventions enumerated therein. The study has provided important evidence to improve maternal and child health in the Asian population. The methods, however, appear to have considerable limitations, wherein the time point of diagnosis of GDM, severity of GDM, selection bias, compliance to therapy, important maternal covariates, observable microvascular abnormalities and the confounding effect of added insulin have not been considered. We have provided suggestions to improve the external validity of the study, including the use of Equator Network reporting guidelines and inclusion of overweight and obese patients in future studies.

Key Words: Glucose intolerance; Hyperglycemia; Obesity; Pregnancy; Research methodology

Core Tip: In the retrospective study by Luo *et al* regarding clinical outcomes in gestational diabetes mellitus (GDM), the results are statistically significant in favour of the benefits of individualized nutrition interventions enumerated therein. The study has provided important evidence to improve maternal and child health in the Asian population. The methods, however, appear to have considerable limitations, wherein the time point of diagnosis of GDM, severity of GDM, selection bias, compliance to therapy, important maternal covariates, observable microvascular abnormalities and the confounding effect of added insulin have not been considered. We have provided suggestions to improve the external validity of the study, including the use of Equator Network reporting guidelines and inclusion of overweight and obese patients in future studies.

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TO THE EDITOR

We read with great interest the retrospective study by Luo *et al*[1] and congratulate the authors on their effort to establish the role of individualized nutrition interventions on clinical outcomes in gestational diabetes mellitus (GDM).

The authors have chosen a very important and relevant contemporary topic affecting the health of pregnant women and their newborns, and have examined their concerns for different complications and effects in detail. They have well highlighted the importance of individualized nutrition intervention programmes to tackle these concerns.

The authors have analyzed and compared intervention and control group data to arrive at a well-formed conclusion about the role of individualized nutrition interventions. Their conclusion, that pregnancy weight gain in GDM could be considerably controlled by careful modulation of diet and exercise, which can, in turn, improve glycolipid metabolism and reduce perinatal complications, is in concurrence with previous research from the Asian population[2].

The authors have described the limitations of the study honestly, and have overall contributed to providing significant evidence for the benefit of maternal and child health of the Chinese population. However, we find it pertinent to emphasize the following, the consideration of which could have further strengthened the evidence generated by the study.

GDM is glucose intolerance that is first diagnosed during pregnancy most commonly at 24–28 wk gestation[2]. However, the sample in the study was not stratified at the outset with respect to the gestational age at which gestational diabetes was detected, or the severity of GDM at diagnosis. Hence, the time point of initiation of therapy for the subjects in each of the groups may have been further elucidated.

It remains unclear how this study followed a retrospective data collection timeline, and the group size and method of selection of patients in the two groups is also not explained. Equator Network guidelines for reporting in the description of methodology, in our view, improve the external validity of the study.

The interventions in the study seem subject to selection bias, given that the authors have not specified the protocol of individualization. For example, in patients with inflammatory bowel disease, a range of exercises have been shown to be safe including moderate intensity aerobic exercise, resistance training and high intensity interval training[3]. It would be clinically useful to know what intensity and duration of dietary and exercise-related interventions would benefit what levels of blood sugar in patients with GDM.

The authors have not explored whether those following an individualized regimen had a higher level of compliance compared to the other group. If the authors obtained patient records retrospectively, it is also not apparent as to how the compliance to therapy was cross-verified.

Complications reported by the authors fall into a debatable circumstance – it appears that in a study of over 400 patients, no patient had more than one complication. Caesarean section can be indicated in patients with premature rupture of membranes if induced labour does not progress, as well as in advanced cases of pregnancy-induced hypertension. Factors such as cephalopelvic disproportion that could have led to more cesarean sections in the conventional group could have been detailed further.

The most important biochemical parameters in the study were fasting blood sugar of 5.1 mmol/L and post-prandial blood sugar of 6.7 mmol/L. One of the important complications of high blood sugar levels in pregnancy is the increased risk of microvascular disturbances. Some authors have suggested that there is no risk of ocular complications in gestational diabetes[4]. However, others have emphasized that GDM is a significant risk factor for long-term ophthalmic morbidity as patients with history of GDM had significantly higher incidence of glaucoma, diabetic retinopathy and retinal detachment compared to controls[5]. A series of retinal arteriolar abnormalities, including narrower caliber, reduced fractal dimension and larger branching angle have been observed in GDM at 26-28 wk of gestation. These are attributable to a relatively hypoxic state of the retina, although the causal relationship needs further elucidation[6]. A significant proportion of women develop diabetes mellitus years following GDM. Diabetic retinopathy will affect about one-fifth of them[7]. It would have been useful if ophthalmoscopic findings could also have been included in the study as an outcome measure, as the state of the retinal vasculature is a true reflection of small blood vessels elsewhere in the body [6].

The authors were ethically correct in starting insulin in addition to nutritional intervention therapy if the blood glucose remained uncontrolled after an interval of 2 wk of individualised nutrition intervention. However, we feel that this appears to be too short an interval for the intervention to have any significant impact on blood glucose. The authors have not specified what proportion of patients required insulin, and thus the confounding effect of insulin on outcomes of the intervention group cannot be ruled out.

In addition, the study makes no mention of important maternal covariates such as pre-pregnancy weight, past history of GDM, and family history of diabetes. Blood pressure at baseline has not been mentioned and it is unclear if differences in predisposition to pregnancy-induced hypertension existed between the two groups at the beginning of the study. Obesity is itself a risk factor for GDM[8]. It is also not clear whether the weight or BMI of subjects in the two groups at the time of diagnosis of GDM has been considered which would again influence the outcome of the study. As the pre-pregnancy BMI is normal in both groups, we believe that validation of the study outcomes through a prospective study with a carefully stratified, overweight and obese GDM cohort is required for it to be more clinically useful in day-to-day practice[9].

Once again, we congratulate the authors on providing important suggestions about non-pharmacologic management of GDM to improve maternal-fetal outcomes, and hope that future research in this direction includes the aforementioned considerations to further strengthen the evidence.

FOOTNOTES

Author contributions: Morya AK designed and formulated the research; Nishant P, Sinha S and Prasad R performed research; Sinha S and Sinha RK analyzed data and wrote the letter; and Nishant P revised the letter; All the authors have read and approved the final manuscript; Sinha S, Nishant P and Sinha RK analyzed the existing data and performed extensive literature search to justify the analysis presented in the manuscript.

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