Exploring the relationship between regular physical activity and the 24-hour glucose cycle in gestational glucose intolerance and gestational diabetes mellitus

OBJECTIVE: Physical activity (PA) is recommended for gestational diabetes mellitus (GDM) for its metabolic benefits,1,2 but PA’s impact on the 24-hour glucose cycle has yet to be explored.

STUDY DESIGN: Our pilot feasibility trial (ClinicalTrials.gov Identifier NCT04209348) compared a behavioral PA intervention with a general wellness intervention for gestational glucose intolerance (GGI) (glucose ≥130 mg/dL on the 50-g, 1-h screening at 24–28 weeks’ gestation) or GDM (by the Carpenter and Coustan criteria). Patients from the University of Tennessee Medical Center were enrolled (N=20; institutional review board #4547) and completed study visits at 30 to 31 weeks and 36 to 37 weeks of gestation. Because of COVID-19 protections, participants opted in to the continuous glucose monitor (CGM) assessment. Thus, a subset wore Dexcom G6 CGMs (Dexcom, Inc, San Diego, CA), linked to a masked receiver, on the posterior of the upper arm3 for 7 days (14 participants at baseline, 11 at follow-up, and 10 at both). Participants also completed surveys, which included the Stanford Leisure-Time Activity Categorical Item (L-Cat), a single item that has strong psychometrics.4 The L-Cat categorized PA behavior in the past month according to national PA recommendations (ie, sufficient vs insufficient PA).

Typical 24-hour glucose functions were estimated with B-splines (ie, third-degree polynomials with 17 knots) via functional data analysis in JMP software (version 16) from SAS (SAS Institute, Cary, NC).5 Standard least-squares regression of the functional data analysis—generated 24-hour mean glucose, controlling for GDM, was also
run in JMP. Visual assessment of the functions revealed that glucose in the early morning period might be lower for those with sufficient PA than those with insufficient PA. PROC MIXED in SAS compared mean midnight 6-AM glucose by sufficient vs insufficient PA, controlling for GDM.

RESULTS: The Figure displays the 24-hour glucose functions for sufficient PA (red) vs insufficient PA (blue), and their 95% confidence intervals (shaded areas) at baseline (panel A) and follow-up (panel B). At baseline (n=14), 4 participants (29%) had GDM, and 3 (21%) reported sufficient PA; 2 of the 3 reporting sufficient PA at baseline also had GDM. Adjusted mean 24-hour glucose at baseline was 90.9 mg/dL (SE, 6.7) for sufficient PA and 96.6 mg/dL (SE, 4.2) for insufficient PA (P=.51). Adjusted mean midnight 6-AM glucose at baseline was 88.4 mg/dL (SE, 7.2) for sufficient PA and 93.3 mg/dL (SE, 4.5) for insufficient PA (P=.59). At follow-up (n=11), 3 participants (27%) had GDM and 5 (45%) reported sufficient PA; 2 of the 5 reporting sufficient PA at follow-up also had GDM. At follow-up, adjusted mean 24-hour glucose was 95.8 mg/dL (SE, 4.3) for sufficient PA and 102.1 mg/dL (SE, 4.5) for insufficient PA (P=.33). Adjusted mean midnight 6-AM glucose at follow-up was 94.8 mg/dL (SE, 4.9) for sufficient PA and 98.1 mg/dL (SE, 5.1) for insufficient PA (P=.64).

CONCLUSION: Findings in this small sample of GGI and GDM patients with variable diets are clinically interesting and support further investigation using CGMs to explore the association of targeted PA with glucose and perinatal outcomes in pregnancies complicated by glucose intolerance.

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REFERENCES


Effectiveness of REGEN-COV combination monoclonal antibody infusion to reduce the risk of COVID-19 hospitalization in pregnancy: a retrospective cohort study

OBJECTIVE: Pregnancy is a risk factor for severe COVID-19. The REGEN-COV combination monoclonal antibody infusion, efficaciously reduced COVID-19 hospitalization in nonpregnant patients who were at risk of severe disease but did not meet the admission criteria. When REGEN-COV was issued emergency use authorization in the summer of 2021, national organizations endorsed the use of antispike monoclonal antibodies in pregnant patients, despite their exclusion from efficacy trials. We hypothesized that REGEN-COV infusion reduces the risk of COVID-19 hospitalization among pregnant patients diagnosed during alpha- and delta-predominant COVID-19 waves.

STUDY DESIGN: This is a retrospective cohort study in a large regional hospital system including unvaccinated pregnant patients with polymerase chain reaction-confirmed symptomatic SARS-COV-2 infection who did not meet admission criteria at the time of diagnosis from March 2020 through December 2021. Patients with higher-order multiple gestations and symptom onset at >10 days before presentation were excluded, as were those who received inpatient care at the time of diagnosis—either for COVID-19 or for delivery. REGEN-COV administration was compared against no administration; the decision for administration was made by the treating clinician and the patient concerned, based on a shared decision-making model. The primary outcome was subsequent COVID-19 hospitalization. The secondary outcomes included National Institutes of Health-defined critical or severe COVID-19, preterm delivery, and perinatal outcomes. Adverse events included an infusion reaction or re-presentation to care secondary to suspected complications from REGEN-COV infusion. A subanalysis was planned to

<table>
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<th>Outcome</th>
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<tbody>
<tr>
<td></td>
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<td>N=88</td>
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<tr>
<td></td>
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<tr>
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</tr>
</tbody>
</table>

CI, confidence interval; OR, odds ratio.

* Adjusted for maternal age, pregravid body mass index, and third trimester COVID-19 diagnosis.