Due to the low number of studies and inconsistencies in reporting metrics, the results for the secondary outcomes are weak. However, there were trends for reduced risk of hypoglycemia, improved quality of life, and no changes in insulin dose, weight, or fasting plasma glucose level. The literature shows a wide variation in carbohydrate counting ability with greater accuracy and precision associated with lower HbA1C levels. However, skill and compliance were not measured in these studies.

As this analysis shows, carbohydrate counting may not result in optimal blood glucose control and clinicians need to realize some patients may fail with this approach. Many people with T1D have difficulty managing postprandial blood glucose levels despite their best efforts. In addition, carbohydrate counting has been linked to unhealthy food beliefs, fats and protein intake that exceed nutritional recommendations, and increased reliance on packaged foods. Clinicians need to emphasize healthy eating with insulin matched to food choices rather than choosing foods to limit insulin or making dosing easier. Additional research is needed to support the use of carbohydrate counting in clinical practice, particularly in children and adolescents. Recent studies examining the effect of protein and fat on insulin requirements show promising results and could provide an alternative method for determining prandial insulin dose.

Lifestyle Intervention Is Beneficial in Pregnant Women at Risk for Gestational Diabetes

Written by **Maria Vinall**

Lifestyle modifications incorporating healthy diet and increased physical activity in nonpregnant adults are effective for proper weight control as well as prevention of diabetes in at-risk individuals. Jessica Marcinkevage, PhD, MSPH, Centers for Disease Control and Prevention and Emory University, Atlanta, Georgia, USA, reported the results of study in pregnant women at risk for gestational diabetes in which a similar lifestyle intervention (LSI) was effective in improving glucose metabolism and insulin resistance.

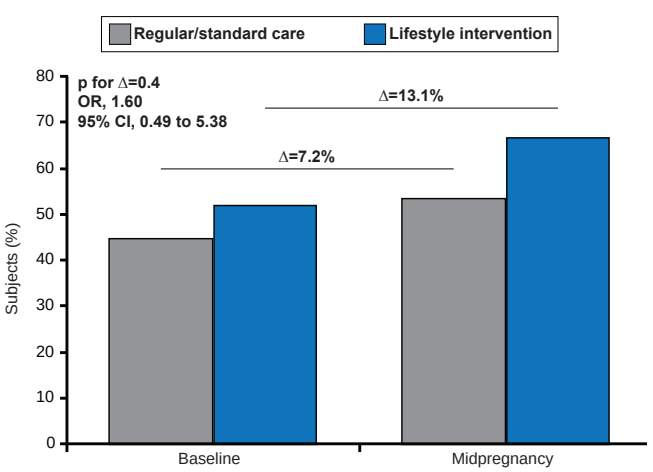
The objective of this randomized, controlled, pilot feasibility study was to assess the effects of LSI on glucose metabolism and insulin resistance in overweight/obese (body mass index [BMI] ≥25 kg/m^2) low-income African American women. Women <20 weeks gestation with singleton pregnancies were randomized to either regular/standard care (RC; n=29) or LSI (n=28) which included individualized one-on-one counseling on physical activity and dietary advice in addition to standard care. They also received biweekly booster calls and pedometers to track physical activity. Women in the RC group received written literature on physical activity and diet during pregnancy during their baseline visit only and proceeded with regular prenatal care as scheduled.

Study outcomes included physical activity determined by a self-reported Pregnancy Physical Activity Questionnaire, gestational weight gain from baseline visit, glucose metabolism (total glucose area under the curve), documented evidence of gestational diabetes, and insulin resistance (homeostatic model of insulin resistance). There were no differences in baseline characteristics between the two groups. Subjects were mean age 24 years and ~12 weeks pregnant when recruited. About 60% of the total sample was either obese or morbidly obese and >30% were current or former smokers. The majority of women reported diabetes in a first-degree relative.

Over the duration of their pregnancies, women in the LSI group gained ~10 kg versus 9 kg for women in the RC group. There were no differences between groups in the median weight gained at midpregnancy and prior to delivery, or in the amount of weight retained from delivery to the 6-week postpartum visit.

Women in the LSI group had higher odds of meeting physical activity recommendations at midpregnancy compared with women in the RC group (OR, 1.60; 95% CI, 0.49 to 5.38; Figure 1).

Figure 1. Percentage of Subjects Meeting Physical Activity Recommendations



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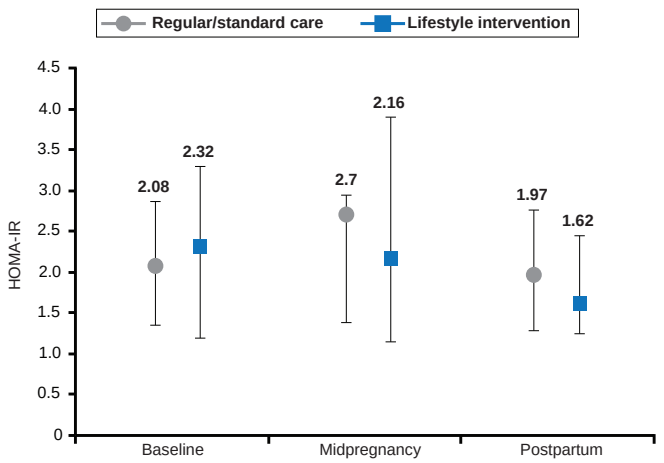
There was improved glucose metabolism (p<0.05) at midpregnancy in the LSI group. There were trends indicating improved insulin resistance at both midpregnancy and post partum for the LSI group compared with the RC group. (Figure 2). In addition, for women in the LSI group there was a 12% decrease in the odds of developing gestational diabetes compared with those in the RC group (Figure 3).

Figure 2. Changes in Insulin Resistance



HOMA-IR=homeostasis model of assessment - insulin resistance.

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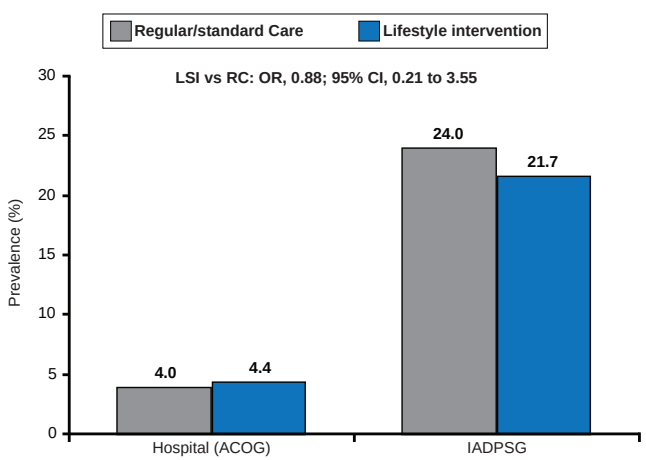
Figure 3. Prevalence of Gestational Diabetes Mellitus



ACOG=American Congress of Obstetricians and Gynecologists; IADPSG=International Association of Diabetes and Pregnancy Study Groups; LSI= lifestyle intervention; RC=regular care.

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The study was not designed to be a definitive trial, thus larger trials are needed to confirm these results. Dr. Marcinkevage suggested that the modest but definitive effects of LSI on glucose metabolism and insulin resistance might be a factor of β-cell function and early insulin response.

Participation in VA's MOVE! Associated With Weight Loss

Written by John Otrompke

Participation in a lifestyle change program operated by the Veterans' Administration (VA) was associated with modest but sustained weight loss, according to Sandra L. Jackson, MPH, Emory University and Atlanta VA Medical Center, Atlanta, Georgia, USA, who presented results studying the MOVE! program. It is the largest lifestyle change program in the United States; however, <10% of the 402,693 veterans involved in this program met the VA's criteria for "intense and sustained" participation (ie, they participated in ≥8 sessions over 6 months, with at least 129 days between the first and last session attended).

MOVE!, instituted in 2005, was modeled on the Diabetes Prevention Program (DPP) of the National Institutes of Health, but has had more limited success. Participants in the DPP had to be prediabetic, while MOVE! participants must have a body mass index (BMI) of ≥25 kg/m^2 with a weight-related condition or of ≥30 kg/m^2, and may be advised by their physician to enter the program, or may learn of it and become involved through the MOVE! website. The DPP lasted for 16 sessions, while MOVE! duration is 8 to 12 sessions.

At baseline, MOVE! participants had a mean age of 57 years, 88% of them were male, and ~50% were married. Twenty-two percent were black.

Three-year follow-up data were available for 135,686 participants. Over this period, mean BMI fell from 36.3 to 35.8 kg/m^2. A total of 8.7% participated actively (ie, achieved "intense and sustained" participation), and lost 2.7% of their body weight at 3 years compared with those who participated less actively, who lost 1.1% ($p<0.001$). By comparison, those in the DPP lost 4% of their body weight at 3 years. The researchers hypothesized that participants in DPP, who volunteered to take part in a research study, may have been more motivated, and the DPP was a more intensive program.

Thirty-eight percent of MOVE! participants had diabetes at baseline. Diabetic patients were more likely to participate actively compared with those who did not have diabetes (9.6% vs 7.8%; $p<0.01$). Furthermore, diabetic participants lost 1.7% of their weight at 3-year follow-up, compared with nondiabetic patients, who lost 0.9% of their weight ($p<0.01$).

Of the 66,933 participants for whom 3-year follow-up data were available and who did not have diabetes at baseline, 18.7% went on to develop diabetes. Among participants, losing more weight was associated with a lower risk of developing diabetes.

Research is ongoing in 2.5 million patients (both participants and eligible nonparticipants) to investigate the impact of MOVE! participation on diabetes incidence and other health outcomes.