

# Maternal and Neonatal outcomes in GDM requiring treatment with insulin or metformin

## Background

An estimated 7% of all pregnancies were complicated by diabetes, of which 86% were GDM.<sup>1</sup> These women are noted to have an increased rate of maternal weight gain, fetal macrosomia<sup>5</sup>, perinatal death, shoulder dystocia<sup>2</sup>, and pre-eclampsia<sup>5</sup>. ACOG and SMFM released “guidelines on management of GDM [in 2018]. The two organizations agree on insulin as a preferred treatment ... but differ on the acceptability of oral agents as alternatives.”<sup>3</sup> Recent studies have demonstrated possible benefit to oral agents in addition to their being “less expensive and generally better tolerated.”<sup>5</sup>

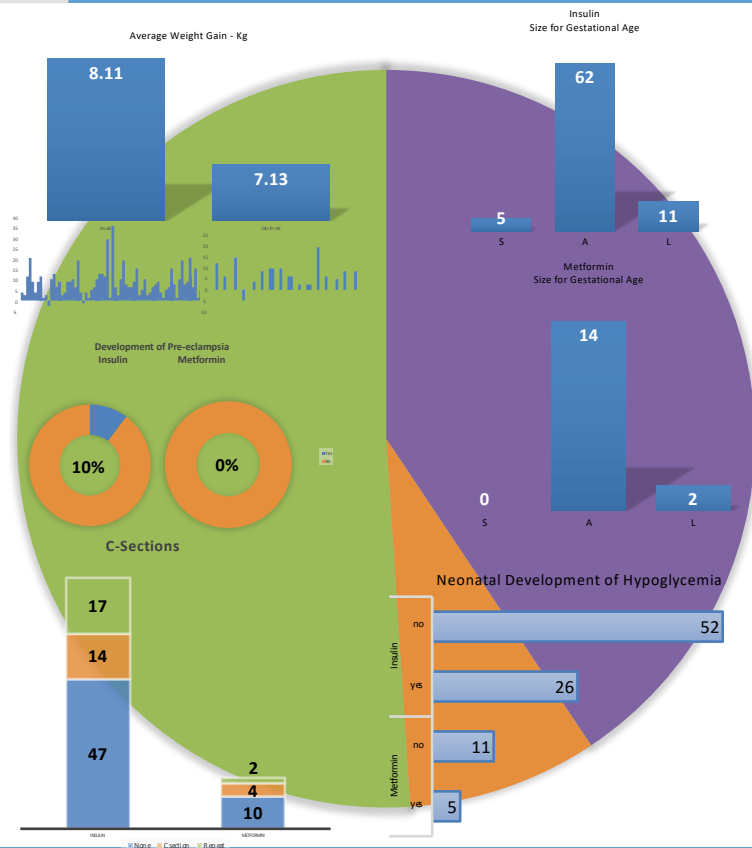
## Purpose and Rationale

At HHC, as a FQHC, we practice amongst a largely underserved, Latina and African American population at increased risk for developing GDM.<sup>4</sup> We sought to determine the differences in outcomes for patients with GDM treated with insulin or metformin.

- Increase general knowledge of outcomes in GDM treated with insulin or metformin by providing descriptive summaries of the difference in maternal weight gain, fetal birth weight, and gestational age at delivery.
- Determine relative risk associated with insulin versus metformin in the development of neonatal hypoglycemia, LGA neonates, and pre-eclampsia.

## Methodology

- Retrospective study w/ Convenience sample.
- Discrete data search using EMR for admission and discharge diagnosis of GDM; Rx of insulin and/or metformin; mode of delivery; GA at birth; birth weight; and neonatal hypoglycemia.
- Chart review to validate patient information and collect non-discrete data



## Study Design

### INCLUSION CRITERIA:

1. Women who delivered during the period January 1, 2013 to December 31, 2017.
2. Development of gestational diabetes mellitus; requiring pharmacotherapy with insulin and / or metformin during gestation.
3. Neonates aged 0 – 1 years delivered to the above women.

### EXCLUSION CRITERIA:

1. Prior history of diabetes

## Results and Discussion

- Retrospective study, consistent with larger meta-analysis demonstrating favorable short-term outcomes for Metformin versus insulin as illustrated.
- There was a small shift in the RR toward Neonatal outcomes and gestational hypertensive disease.
  - Pre-eclampsia (not calculatable as no pre-eclampsia observed in the Metformin population)
  - LGA RR = 1.128
  - Neonatal hypoglycemia RR = 1.067
- Decrease in GA for Metformin (36+4) v Insulin (38+4).

### Limitations

- Retrospective study: Under-powered (16 in Metformin arm); cannot account for confounders; no standardized treatment protocol (e.g. Metformin 500, 850, 1000mg BID); unknown compliance

### Discussion

- Retrospective study consistent with mounting evidence that oral antihyperglycemic agents, specifically Metformin, may provide better outcomes than insulin therapy alone. Demonstrates the need for studies dedicated to evaluation of short and long-term outcomes of GDM treatment with insulin v metformin.

### References:

1. ACOG Practice Bulletin #109 Gestational diabetes Mellitus ACOG Volume 131 No 2, February 2018
2. Cunningham et. al. Williams Obstetrics 24<sup>th</sup> edition McGraw Hill:2014 Chicago1136-1143
3. Powe, Camille MD; Bryant, Allison MD. Oral Alternatives to Insulin for Gestational Diabetes? NEJM Journal Watch <https://www.jwatch.org/na46648/2018/07/10/oral-alternatives-insulin-gestational-diabetes>
4. American Diabetes Association Diabetes Care 2018 Jan; 41(Supplement 1): S137-S143. <https://doi.org/10.2337/dc18-S013>
5. Balsells M. et al. Glibenclamide, metformin, and insulin for the treatment of gestational diabetes: a systemic review and meta-analysis. BMJ 2015; 350:H102 January 21, 2015
6. Martis R. et. al. Treatments for women with gestational diabetes mellitus: an overview of Cochrane systemic reviews. Cochrane Database Syst Rev. 2018 August 14