**GESTATIONAL DIABETES: SUMMARY OF INSIGHTS**

Gestational Diabetes Mellitus(GDM) is a common, well documented medical complication of pregnancy. Our initial research focused on learning about the medical condition and reading as many clinical studies as possible, to understand this condition better. Given below is a break down of our analytical process:

**PART 1: RECOGNIZING THAT A SUBSET OF THE WHOLE, IS REPRESENTATIVE OF THE WHOLE**

Our excel source file only represented 565 patients, of which 74 patients had GDM. This meant that we had to accept that:

1. Every medically proven fact may not be present in a much smaller dataset of 565 rows.
2. The number of patients without GDM was roughly 7 times larger than the number of patients with GDM. Therefore a number-based comparison of the 2 populations would result in faulty conclusions.

However, a subset of the whole will continue to accurately represent the whole, even if it cannot represent every problem.

***With this in mind, we were able to find that the percentage of patients experiencing pregnancy-related complications was higher in the group that was diagnosed with GDM.***

**PART 2: REPRESENTING THE DATA IN A MANNER THAT IS MEDICALLY ACCURATE**

The following are the verifiable correlations to GDM we were able to find within our dataset:

1. Labor and Birth Related Complications
   1. 47.3% of all pregnancies with GDM needed a C-Section Vs 31.03% in patients without GDM. Making C-Sections 1.5 times more likely if GDM was present.
   2. Emergency procedures were twice as likely if a patient had GDM (17.6% Vs 8.8%)
   3. A pregnancy was 1.5 times more likely to be classified as high risk if the patient was diagnosed with GDM (19% Vs 11%)
2. Health of the Liver and Kidneys:
   1. When liver cells are damaged, they release ALT into the bloodstream. High levels of ALT in the bloodstream may be a sign of a liver injury or disease. Patients with GDM were 3 times more likely to have signs of liver damage than those with no GDM (33% vs 11%)
   2. High levels of Creatinine and Albumin can be an early sign of pregnancy-induced hypertension, which may increase the risk of pre-eclampsia. Lab results show that patients with GDM were more than twice as likely to have high levels of both inflammatory markers (6.7% vs 3.1%)
   3. Increased C-Reactive Protein levels are a sign of low-grade inflammation which may increase the risk of fetal growth restrictions and neonatal complications. Patients with GDM were 1.5 times more likely to have high levels of CRP (47% Vs 36.5%)
3. Physical Health of the patient as observed during visit 1:
   1. Patients with high BP were almost twice as likely to be diagnosed with GDM (8% vs 4.8%)
   2. Patients with a high HBA1C value at Visit 1 were 10x more likely to be diagnosed with GDM
   3. Patients with a BMI of over 30 at visit 1 were 1.5x more likely to be diagnosed with GDM.
   4. Current smokers were 7x more likely to be diagnosed with GDM
   5. Hypercalcemia in pregnancy is an uncommon event that can cause major maternal morbidity and/or fetal or neonatal morbidity and mortality. The incidence of hypercalcemia in patients with GDM was 3x higher than those who did not present with GDM(19% vs 6%)
   6. Patients with low levels of Vitamin D were 7% more likely to be diagnosed with GDM.

In the case of physical health, we cannot prove causation of GDM through these markers, as we do not have an understanding of individual risk factors. However, we found **strong correlations** between the physical markers listed above and a diagnosis of GDM later in pregnancy.

**PART 3: ADDITIONAL ANALYSIS OF THE DATASET.**

In addition to our findings on the critical factors of GDM, we also analyzed the health of the patients in the 3rd trimester and compared the % of Cesarean births and emergencies to Vaginal deliveries.

Below is a summary of our observations:

1. Resting heart rates recorded at visit 3 were high in 20% of all patients
2. Hemoglobin levels were less than 11.0 g/dL (anemia) in almost 30% of all patients
3. 10% of all births recorded in this dataset were emergencies.
4. Over 30% of all C-Sections were unplanned emergencies

We decided to look for commonalities between patients that were admitted with emergencies.

We found that most markers of heart health could also be used to measure the risk of emergency procedures. For eg:

1. BMI is a known factor of heart health. Over 60% of all those with BMI not in recommended ranges, were admitted for emergencies
2. High blood Pressure levels which are usually a marker of heart disease was also a leading factor that was present in over 70% of those admitted for emergency procedures
3. Other than this, high CRP levels were also common in just over 50% of those admitted.

**CONCLUSION**

Overall, we found that a high BMI and low cardiovascular fitness resulted in poorer outcomes, regardless of the diagnosis of Gestational Diabetes.

However, the percentage of those at increased risk of heart disease and pregnancy complications was greater in those diagnosed with Gestational diabetes, leading us to believe that insulin resistance and high blood glucose levels are likely the most important markers of overall health in pregnant women.

**Visualization Link:**

<https://public.tableau.com/app/profile/jyotsna.john/viz/GDM_Data_Divers_16842684982340/CriticalMarkersOfGDM?publish=yes>