DATATHON- 2023

PROJECT: GESTATIONAL DIABETES

TEAM 6: DATA_CRACKERS

AMMU FREDY
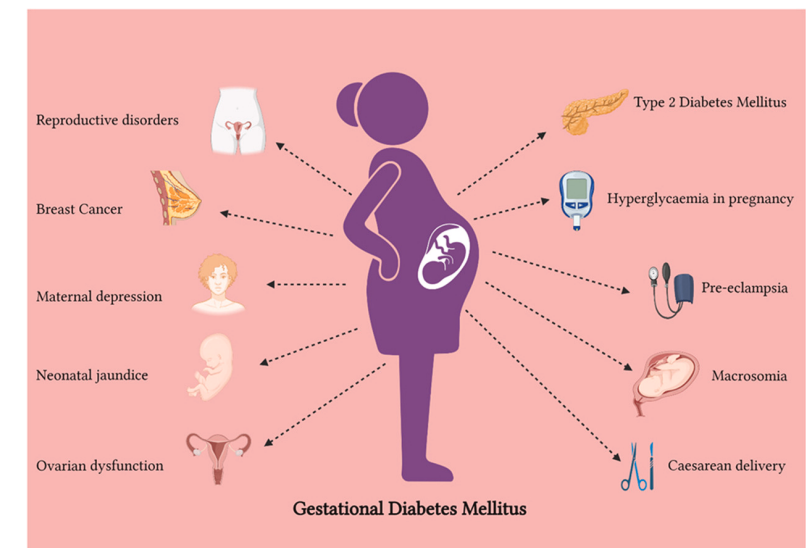ANAMIKA HARIDAS
SEENU RAJ
BAISHALI PATRA
SHAHISTHA JABEEN

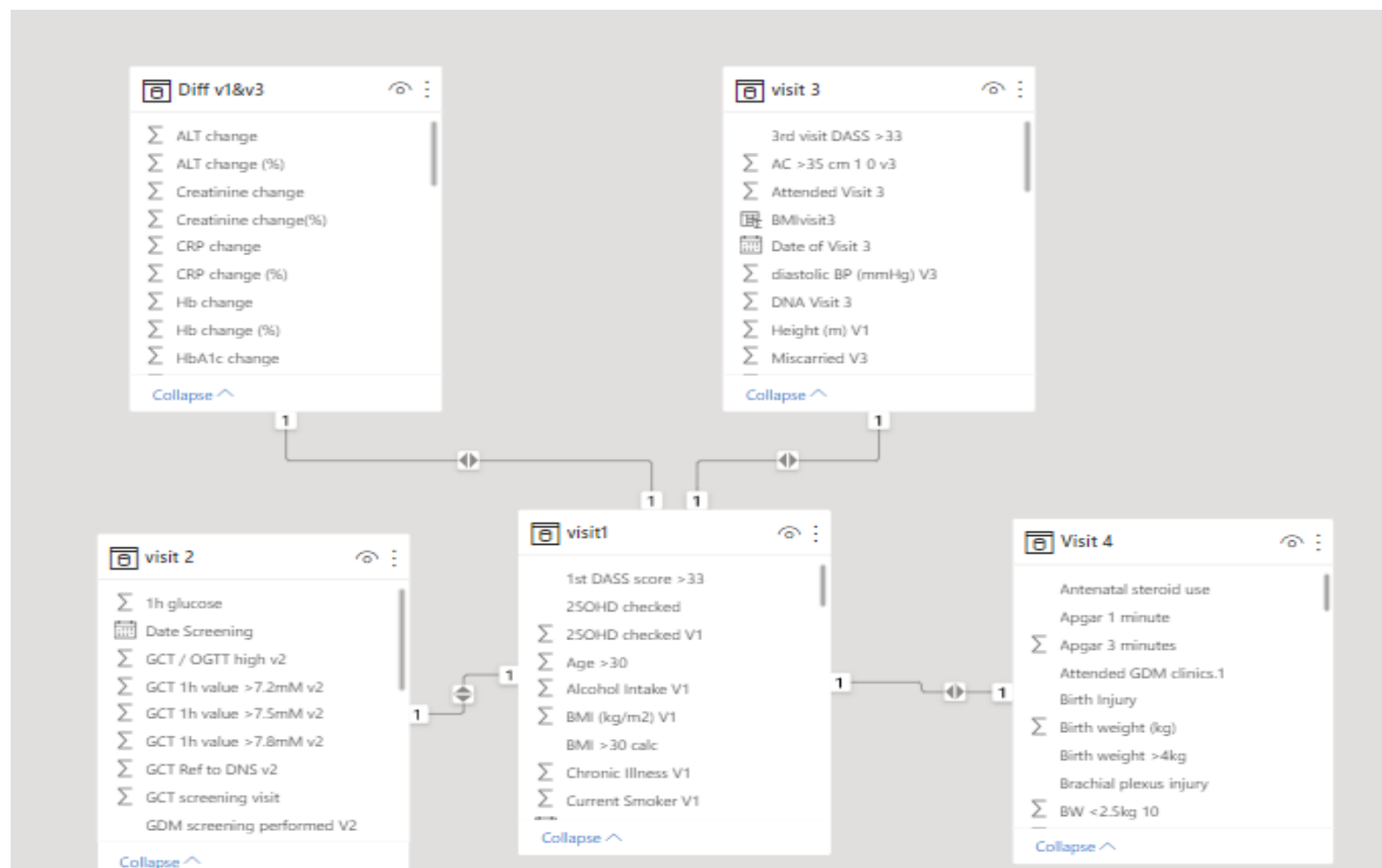# WHAT IS GESTATIONAL DIABETES

Gestational diabetes is a type of diabetes that can develop during pregnancy in women who don't already have diabetes.

What Causes Gestational Diabetes?

· **Gestational diabetes occurs when the body can't make enough insulin during pregnancy. Insulin is a hormone made by the pancreas that acts like a key.**

· **During pregnancy, the body makes more hormones and goes through other changes, such as weight gain. These changes cause the body's cells to use insulin less effectively, a condition called Insulin resistance increases the body's need for insulin.**

Reproductive disorders
Breast Cancer
Maternal depression
Neonatal jaundice
Ovarian dysfunction
Type 2 Diabetes Mellitus
Hyperglycaemia in pregnancy
Pre-eclampsia
Macrosomia
Caesarean delivery
Gestational Diabetes Mellitus

DATA MODEL

(600 x 259)

VISIT 1 (First Trimester)

VISIT 2 (Second Trimester)

VISIT 3 (Third Trimester)

VISIT 4 (After Delivery)

Demographics

Ethinicity of Participants

White
Count of Participant ID
583

Mixed
Count of Participant ID
10

Black
Count of Participant ID
3

Asian
Count of Participant ID
2

Other
Count of Participant ID
2

Distribution of Participants

💡 GDM_all_conditio... ✕

Non Diabetic Group
520

Count of Participa...
600

Gestational Diabet...
74

Pre-Diabetic
6
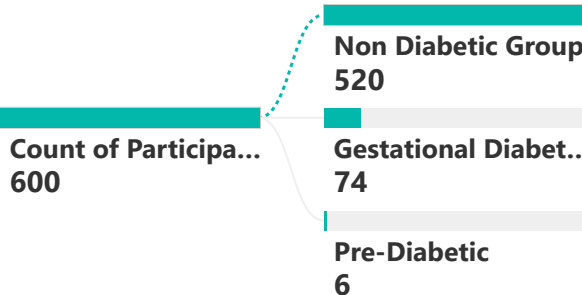
Count of Participant ID below and above 30 yrs

0
222

1
378
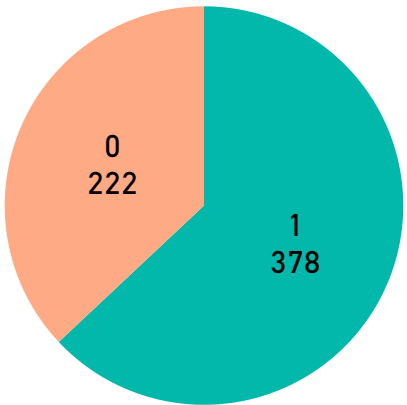
0 - <= 30 Years
1 - > 30 years

BMI Ranges in Participants

Normal Weight
Count of Participant ID
256

Over weight
Count of Participant ID
197

Obese
Count of Participant ID
147

Average BP in Participants

121.79
Average of systolic BP ...

123.26
Average of systolic BP V3

67.46
Average of diastolic BP...

74.32
Average of diastolic BP (m...
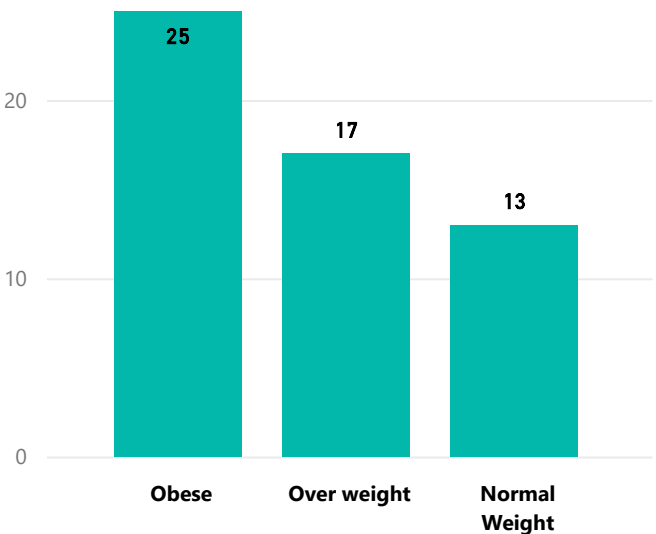
Gestational Diabetes based on OGTT /GCT

Participant ID	GDM_all_conditions	Ethnicity V1	PreviousGDM1 V1	BMIvisit3>30	Age >30	systolic BP V1	systolic BP V3	Insulin	Metformin	Emergency	Caesarean	Birth weight (
6	Non Diabetic Group	White	0	32.76	1	116	112	0	0		No	4.
7	Non Diabetic Group	White	0	30.23	1	122	118	0	0		No	4.
8	Gestational Diabetic Group	Other	0	32.75	1	139	119	0	0		No	3.
12	Non Diabetic Group	White	0	37.54	1	127	115	0	0		Yes	3.
14	Non Diabetic Group	White	0	30.01	0	123	123	0	0		Yes	3.
15	Gestational Diabetic Group	White	0	34.00	1	121	116	1	0		No	3.
19	Non Diabetic Group	White	0	30.21	1	131	118	0	0		No	3.
20	Non Diabetic Group	Other	0	42.05	0	135	133	0	0		Yes	2.
21	Non Diabetic Group	White	0	31.06	1	111	108	0	0		No	3.
22	Non Diabetic Group	White	0	31.02	0	119	113	0	0		No	3.
23	Gestational Diabetic Group	White	0	35.61	1	138	146	1	0		No	3.
24	Non Diabetic Group	White	0	42.00	1	124	108	0	0		No	4.
25	Gestational Diabetic Group	White	0	37.70	1	153	120	1	0	No	Yes	
28	Non Diabetic Group	White	0	32.56	0	130	127	0	0		No	3.
29	Non Diabetic Group	White	0	35.53	1	128	147	0	0		No	3.

- **Majority of patients had high Systolic BP**
- **BMI is greater than 30**
- **No Birth Injury**
- **No premature Babies**
- **Majority of Patients had Vitamin D deficiency even in the Third trimester**
- **After attending the nutrition and Glucose therapy most of them were able to control their GDM (305 didn't go for therapy)**
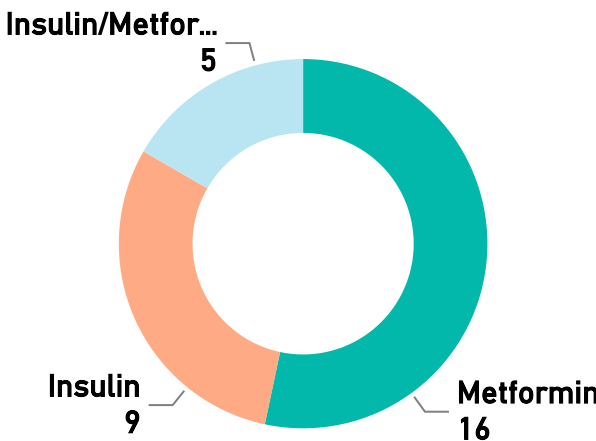- **High Baby Weight**

Patients with GDM & Pre-Diabetes > Age 30

- Age >30
- GDM_all_conditions
- Gestational Diabetic Group — 55
- Pre-Diabetic — 6
- Age >30: 0, 20, 40, 60
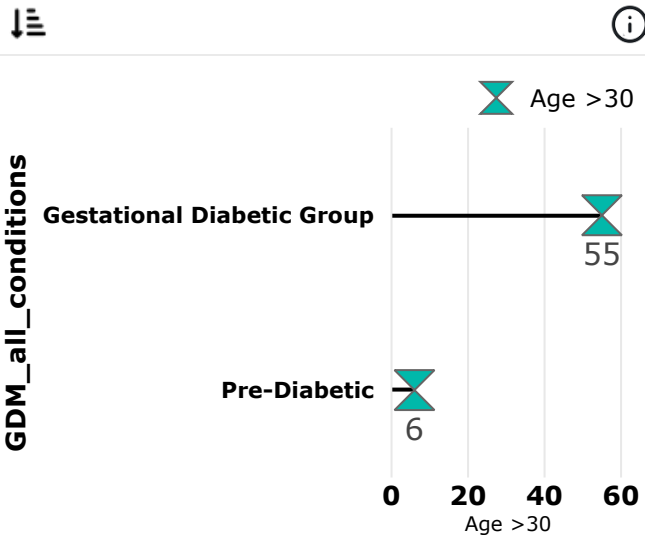
BMI Distribution by Age > 30 in GDM

- Obese: 25
- Over weight: 17
- Normal Weight: 13

Count of Participant ID by Insulin/Metfor...

- Insulin/Metfor... 5
- Insulin 9
- Metformin 16

Count of Participant ID by GDM and Previous ...

- GDM_all_con... — Gestational Diabetic Group, Pre-Diabetic
- 0 - No Previous GDM
- 1 - Previous GDM
- 0 6
- 1 5
- 0 69
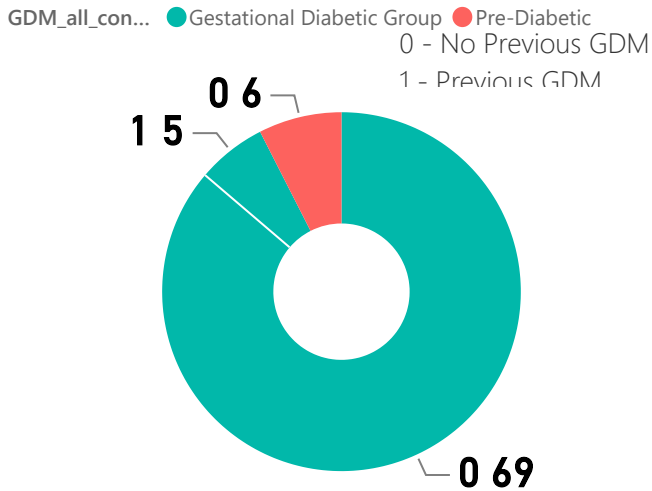
Blood/Urine Analysis

Platelet Levels in GDM Patients in V1 and V3

● Average of V1 Platelet ● Average of V3 Platelet

	Pre-Diabetic	Non Diabetic Group	Gestational Diabetic Group
Average of V1 Platelet	268	248	281
Average of V3 Platelet	307	240	242
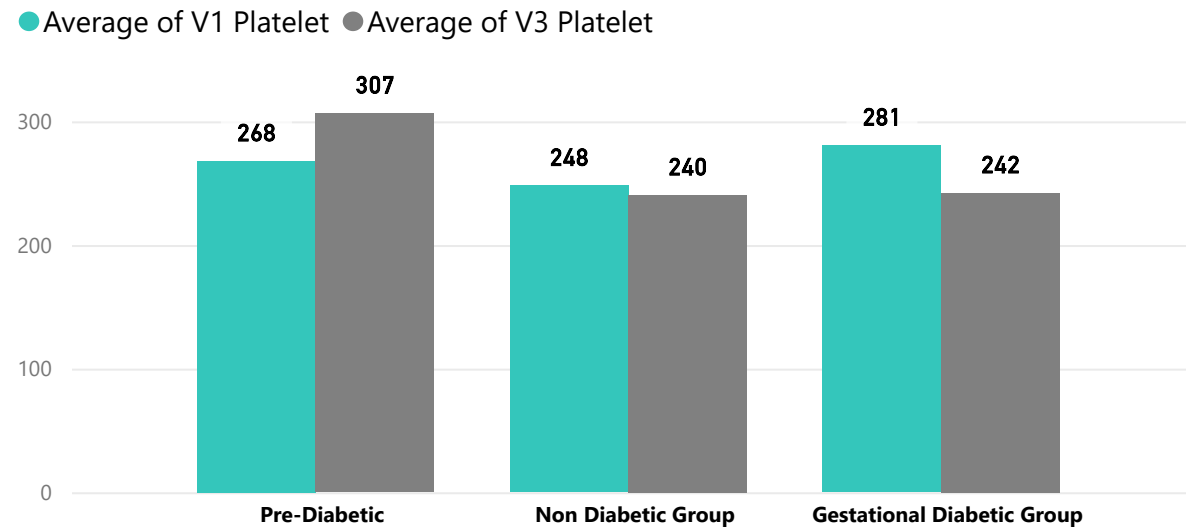
GDM Patients with Vit D Deficiency

Diagnosed with Vi... ● Yes ● No

No 18

Yes 27
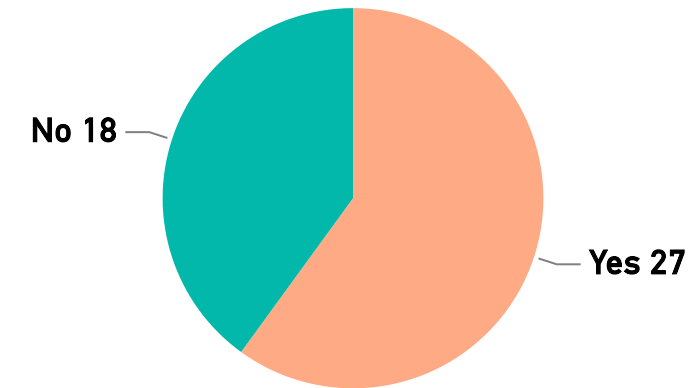
Mean Levels of Biomarkers

🎨 ⬇ ⓘ ⓘ

■ Average of V3 Platelet ■ Average of V3 25OHD value ■ Average of V3 ALT ■ Average of V3 U Creat ■ Average of V3 U Alb ■ Average of V3 WCC

GDM_all_conditions	Average of V3 Platelet	Average of V3 25OHD value	Average of V3 ALT	Average of V3 U Creat	Average of V3 U Alb	Average of V3 WCC
Pre-Diabetic	306.50	29.20	15.33	11.18	16.97	9.93
Gestational Diabetic Group	241.98	53.73	21.20	8.15	9.32	9.83
Non Diabetic Group	240.30	45.92	16.10	8.69	9.01	10.20

Liver Analysis

ALT Levels in Participants for V1 and V3

Legend: V1 ALT, V3 ALT

GDM_all_conditions	V1 ALT	V3 ALT
Pre-Diabetic	16.00	15.33
Non Diabetic Group	16.46	16.10
Gestational Diabetic Group	18.16	21.20
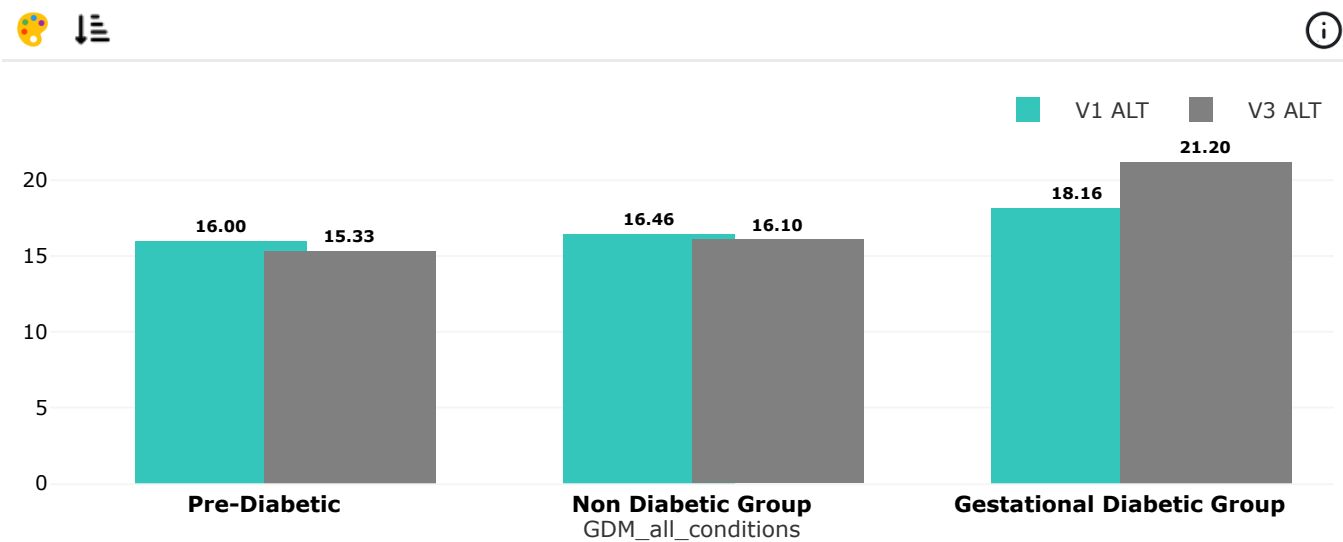
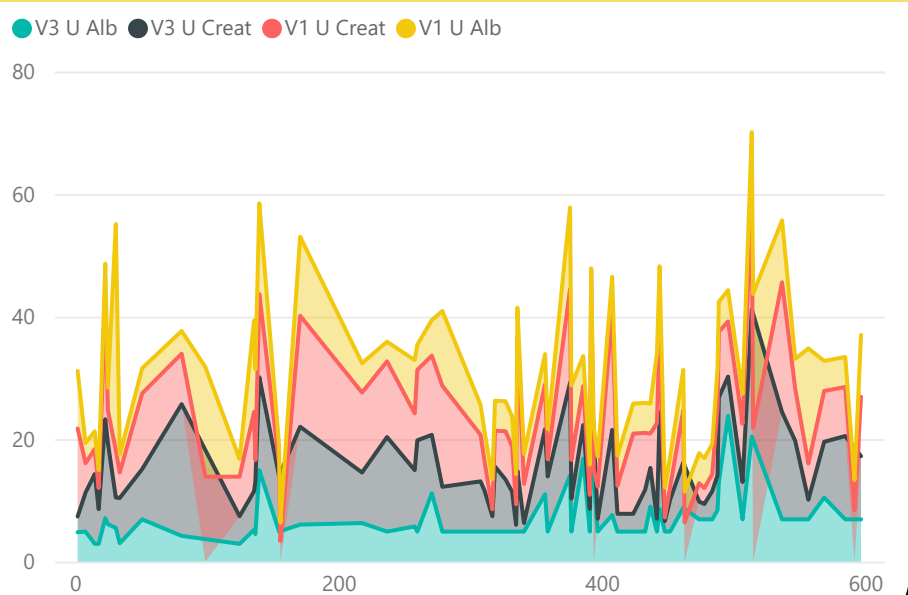| Participant ID	GDM_all_conditions	V1 ALT	V3 ALT	ALT change (%)
496	Gestational Diabetic Group	19	213.00	1,021.05
2	Gestational Diabetic Group	12	78.00	550.00
332	Gestational Diabetic Group	9	43.00	377.78
51	Gestational Diabetic Group	11	47.00	327.27
437	Gestational Diabetic Group	11	36.00	227.27
81	Gestational Diabetic Group	12	34.00	183.33
8	Gestational Diabetic Group	16	42.00	162.50
237	Gestational Diabetic Group	11	26.00	136.36
386	Gestational Diabetic Group	14	33.00	135.71
132	Gestational Diabetic Group	10	22.00	120.00
140	Gestational Diabetic Group	18	26.00	44.44

Kidney Analysis

 A positive linear correlation was found between urinary albumin and urinary creatinine.

Levels were found to be lower than the normal range in GDM patients and also, a lot of positive and negative variations were seen between the V1 and V3 visits.

Correlation between U Creatinine and U Albumin
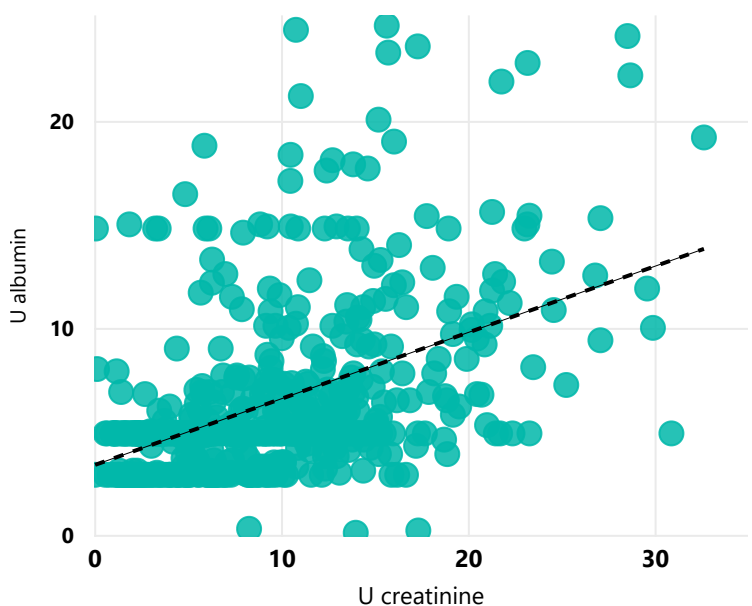
U Albumin and U Creatinine Levels in V1 and V3

Legend: V3 U Alb, V3 U Creat, V1 U Creat, V1 U Alb

Maternal and Fetal Complications

Maternal Complications

Participant ID	GDM_all_conditions	Instrumentation	Emergency	Still-birth	Caesarean	Gestational hypertension	Induction	Gestational_Age
2	Gestational Diabetic Group	No		No	No	No	No	Normal GA
8	Gestational Diabetic Group	No		No	No	No	No	Post-term
15	Gestational Diabetic Group	No		No	No	No	No	Post-term
18	Gestational Diabetic Group	No		No	No	No	Yes	Normal GA
23	Gestational Diabetic Group	No		No	No	No	No	Normal GA
25	Gestational Diabetic Group	No	No	No	Yes	No	No	Normal GA
31	Gestational Diabetic Group	No	No	No	Yes	No	No	Normal GA
34	Gestational Diabetic Group	No		No	No	No	Yes	Post-term
51	Gestational Diabetic Group	No	No	No	Yes	No	No	Normal GA
54	Gestational Diabetic Group	No		No	Yes	No	No	Normal GA
63	Pre-Diabetic	No		No	No	No	No	Normal GA

Fetal Complications

Participant ID	Birth weight (kg)	Apgar 1 minute	Antenatal steroid use
2	2.86	9	No
8	3.18	9	No
15	3.07	9	No
18	3.48	9	No
23	3.36	9	No
31	3.69	9	No
34	3.08	9	No
51	3.25	9	No
54	4.12	8	No
63	2.55	9	No

GDM with Cesarean Delivery

Caesarean ● No ● Yes

Yes 35 — No 36
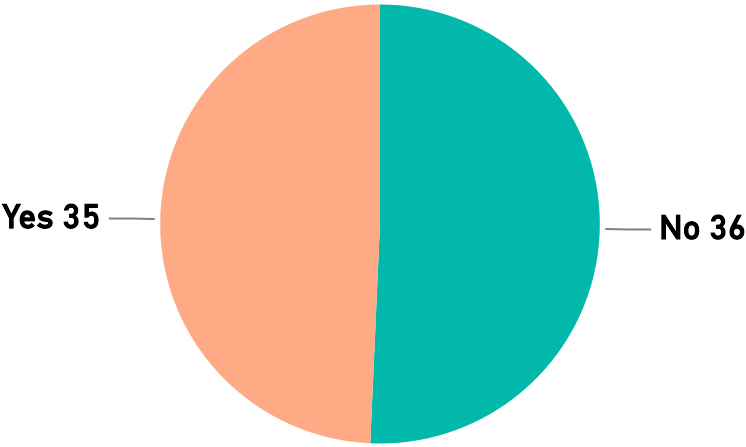
Patients with Gestational Hypertension

Gestational hy... ● No ● Yes

Yes 5 — No 66

THANK YOU