Table 2: Diabetic markers of the study groups

	OAV group (n=84)	Control group (n=56)	p-value
Maternal blood glucose (gr%)	99.0±23	98.7±33	0.1
Maternal HbA1C (units)	5.3±0.4	5.1±0.3	**0.01**
Umbilical cord C-peptide (units)	1.7±1.6	1.3±1.1	**0.007**
Neonatal skin fold thickness (mm)			
Sub scapular (mm)	4.5±1.4	3.8±0.07	0.5
Humerus (mm)	4.4±1.1	5.4±0.8	0.2
ASIS (mm)	4.1±1.2	4.9±1.6	0.4

ASIS- Anterior superior iliac spine

All parameters are reports as mean ± STDV.

407 Risk assessment for adverse neonatal outcomes in pregnancies complicated by gestational diabetes using machine learning

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OBJECTIVE: To assess machine learning and neural network model ability to predict adverse neonatal outcome in pregnancies complicated by gestational diabetes

STUDY DESIGN: Machine learning was used to create pregnancy complication prediction model in diabetic women. Our model was coded using *Python3.6 with Keras framework based on Google's TensorFlow.* The model was implemented using a 4-layers fully-connected neural network: data were fed after batch normalization; another layer of dropout was applied to prevent the model from memorizing the training samples and overfitting the data.

Data were retrieved from the medical records of women diagnosed with gestational diabetes mellitus, who delivered in our medical center (2012-2016).

The following baseline characteristics were included: maternal age, body mass index, parity, gravity, oral glucose test results, diabetes treatment and glycemic control. We defined a composite neonatal adverse outcome including any of the following: large for gestational age neonate, shoulder dystocia, umbilical vein pH< 7.2, neonatal intensive care unit admission, respiratory distress syndrome, hyperbilirubinemia and polycythemia.

For the machine training phase 70% of the cohort was randomly selected, each sample included baseline parameters and the composite outcome. We have then used the rest of the samples to evaluate our model's accuracy. The baseline parameters were fed into the trained model and the predicted outcome was compared to the actual outcome

RESULTS: 452 women with gestational diabetes mellitus were included. The incidence of composite neonatal adverse outcome was 40%. On the randomly picked samples used to evaluate our model, we demonstrated an accuracy rate of 91% in predicting adverse outcome

CONCLUSION: A state-of-the-art machine learning algorithm presented promising ability to predict adverse neonatal outcome among women with gestational diabetes mellitus. The algorithm provides an opportunity to identify at-risk patients who may benefit from early fetal monitoring and intervention

408 Effects of maternal diabetes on pregnancy outcomes

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OBJECTIVE: Women with type 1 and 2 diabetes mellitus (DM) have increased risk of adverse perinatal outcomes, including carrying a fetus with congenital malformation, intrauterine fetal demise, intrauterine growth restriction, macrosomia, and postnatal metabolic disturbances. Early glycemic control in pregnancy is crucial for decreasing adverse outcomes. However, it is unclear whether preconception hyperglycemia also contributes to adverse perinatal outcomes in diabetes. We examined preconception versus intrauterine effects of hyperglycemia on perinatal outcomes using a mouse model of reciprocal embryo transfer, in which embryos produced with oocytes from diabetic (DMOD) or non-diabetic (COD) oocyte donors are transferred to diabetic (DMS) or non-diabetic (CS) surrogate mothers.

STUDY DESIGN: Diabetes was induced by intraperitoneal injection of streptozotocin 200mg/kg into 5 weeks old CD-1 mice. Upon reaching sexual maturity diabetic and control females were used as oocyte donors for in vitro fertilization (IVF) and as surrogate mothers for embryo transfer. Caesarian section was performed at term. One-way ANOVA was used to compare embryo ability to develop (implantation, fetal and abortion rates), fetal and placental weights, and incidence of congenital anomalies.

RESULTS: The diabetic and non-diabetic surrogate mothers had similar ability to carry pregnancy, evidenced as rate of live fetuses (%, DMOD-DMS: 49 ± 7; COD-DMS: 51± 9; DMOD-CS: 66 ± 6; COD-CS: 60 ± 8; P=0.43). Implantation and abortion rates also did not differ among the four groups (P=0.81 and P=0.14). Fetal weights were significantly decreased in offspring from diabetic surrogate mothers, (g, DMOD-DMS: 0.9 ± 0.03; COD-DMS: 0.77± 0.04; DMOD- CS: 1.37 ± 0.02; COD-CS: 1.35 ± 0.02; P=0.0012) while placental weights were similar (P=0.43). Fetuses with major congenital anomalies (anencephaly, myelomenigocele, abdominal wall defect) were observed only with diabetic surrogate mothers (%, DMOD-DMS: 15 ± 6; COD-DMS: 35 ± 15; P=0.003).

CONCLUSION: Diabetic status does not interfere with ability to carry pregnancy. However, adverse perinatal outcomes result when pregnancy is carried by diabetic surrogate mothers regardless whether oocytes are from diabetic or non-diabetic donor. This suggests that pregnancy environment is causative of adverse perinatal outcomes associated with diabetes, which underlines the importance of glycemic control in pregnancy.