

# A Retrospective Cohort Study to Compare Pregnancy Outcomes in Teenage Versus Adult Patients with Type 1 Insulin Dependent Diabetes Mellitus (T1D)



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## Introduction

- Adolescent pregnancy is associated with adverse maternal and fetal outcomes
- Most teenage pregnancies are unintended and less likely to have adequate prenatal care
- Pregnancies complicated by Type 1 Diabetes (T1D) are also associated with adverse pregnancy outcomes
- Improved glycaemic control and preconception planning can improve pregnancy outcomes
- Very little data exists on pregnancy outcomes in teenage pregnancies complicated by T1D

### Objectives:

- To assess glycaemic control achieved in teenage pregnancies with T1D as compared to adult counterparts with T1D
- To compare the risk of adverse pregnancy outcomes between the two groups

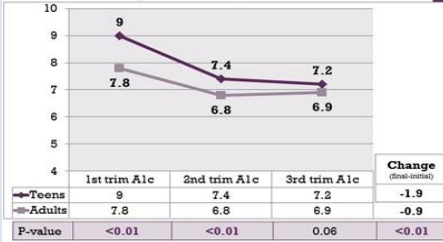
## Materials and Methods

- Retrospective cohort chart review 2007-2015
- Patients followed at Eastern Virginia Medical School, Dept. of Obstetrics & Gynecology, Diabetes in Pregnancy Program
- Two cohorts of pregnant women with T1D
  - Teenagers (age <20 years), n = 43
  - Adults (≥ 20 years), n = 275
- Data extracted: Patient demographics, medical history, insulin pump use +/- Continuous glucose sensor use (CGM), daily insulin requirements, HbA1c change, and obstetrical and neonatal outcomes
- IRB Approval: # 15-05-WC-0103

## Results

- As predicted, there was a significant difference in age, gravity and parity between the groups
- BMI, ethnicity distribution, gestational age at initial visit, and number of prenatal visits were comparable
- As expected, adults entered pregnancy with significantly more medical co-morbidities (thyroid dysfunction, nephropathy, retinopathy and/or hypertension) [70% vs. 51% p<0.01]
- Teens entered pregnancy with a higher HbA1c but achieved a more dramatic decrease ending with HbA1c levels similar to adults

### Hemoglobin A1c (%) trend



- Teenagers were:

- less likely to have preconception counseling
- less likely to use insulin pumps at conception
- more likely to initiate pumps during pregnancy



### Insulin Pump & CGMS use comparison

	Teenage group N=43	Adult group N=275	p-value
Pump prior to pregnancy	27.91%	47.27%	<0.01
Started pump in pregnancy	25.58%	12.73%	<0.01
Gest Age at pump start (weeks)	19.7	19.1	0.62
Use of Continuous Glucose Monitor (CGMS)	34.8%	29.0%	0.10
Use of pump or CGMS during pregnancy	55.8%	61.4%	0.10

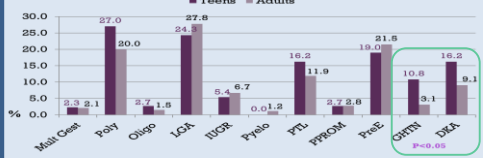
At delivery, both groups had similar rates of pump use

## Results

- Both groups had similar starting total daily insulin doses and a similar increase in insulin resistance (~30%) as pregnancy progressed



### Obstetrical outcomes:



- Gestational age at delivery & rates of induction were comparable
- Adults had more C-Section deliveries [70% vs. 54%, p=0.02]

### Neonatal Outcomes:

- Infant birth weights, LGA rates & Apgars were comparable
- Infants born to teenagers were more likely to require admission to a special care nursery [63% vs. 49%, p=0.04] and to experience hypoglycaemia [45% vs. 24%, p=0.01]

## Conclusions

- We report the largest series of pregnancy outcomes in teens with pregnancies complicated by T1D
- Our T1D teens enter pregnancy with poorer glycaemic control than adults but, with intensive management, they achieve greater improvement & they achieve similar glycaemic control
- Although teens were less likely to already be using insulin pumps/CGM when they conceived, at term, a similar number of teens and adults with T1D (>50%) were using these technologies
- Unlike other published research, our data suggests that with intensive DM management, our teens & adults with T1D have comparable perinatal outcomes for mother and baby

## References

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