

# Impact of Surgical Treatment of Cushing's Disease During Pregnancy on Foetal Outcome

Philip C Johnston<sup>1</sup>, Mahmoud Abbassay<sup>2</sup>, Laurence Kennedy<sup>1</sup>, Amir H Hamrahan<sup>1</sup>, Pablo Recinos<sup>2</sup>  
Department of Endocrinology, Diabetes and Metabolism<sup>1</sup>, and Department of Neurosurgery<sup>2</sup>, Cleveland Clinic Foundation

## INTRODUCTION

- Cushing's disease presenting in pregnancy is rare, hypercortisolism can be associated with increased maternal/foetal morbidity and mortality.
- When hypercortisolism from Cushing's disease does occur in pregnancy, the impact of achieving biochemical remission on foetal outcomes is relatively unknown.
- We sought to clarify the impact of successful surgical treatment of Cushing's disease during pregnancy on foetal outcomes.

## METHODS

- A comprehensive search of the literature was performed for all cases of Cushing's disease in pregnancy.
- Statistical analysis was performed on all pregnant patients with Cushing's disease who were treated with surgery compared to a surrogate control group of pregnant patients with untreated Cushing's syndrome using Fishers exact test.
- Foetal outcomes were compared including preterm labour, intrauterine growth retardation, intrauterine foetal death, and neonatal death.
- Cases of Cushing's disease who were not in remission or with missing postoperative data were mentioned but excluded from our statistical analysis.

## RESULTS

- There were 11 previously reported cases of Cushing's disease surgically managed between the 10<sup>th</sup> and 23<sup>rd</sup> weeks of pregnancy including our own case.
- Of those, 3 cases were excluded due to lack of post-operative biochemical results or follow-up information, 1 case was excluded due to lack of biochemical remission.
- Out of the 11 cases, maternal and surgical complications included pre-eclampsia (n=4), syndrome of inappropriate antidiuretic hormone (n=2), diabetes insipidus (n=1), cerebrospinal fluid leak (n=1). Three patients did not have any maternal or surgical complications.
- **Table 1** demonstrates rates of foetal complications in patients with untreated Cushing's syndrome, surgically treated Cushing's syndrome, and surgically treated Cushing's disease.

## CONCLUSION

Transsphenoidal surgery for Cushing's disease can be performed safely during the second trimester of pregnancy. Although achieving remission of Cushing's disease in pregnant patients may decrease obstetric and foetal complications, current experience is too limited to give definitive conclusions.

## RESULTS

Table 1

Foetal Complications	Untreated Cushing's Syndrome (n=43)*	Treated Cushing's syndrome (n=17)*	Treated Cushing disease (n=7)	P value <sup>¶</sup>
Preterm Labour	31	8	2	0.037
IUGR	11	6	2	0.099
Neonatal death	3	2	1	0.464
IUFD	5	0	0	0.999

\*Data obtained from Buescher et al (1992) review article, \*\* Four cases were excluded for the following reasons: one in which biochemical remission was not achieved with surgery, two with unspecified preoperative and/or postoperative cortisol levels, and one with unknown foetal outcome, ¶ Foetal complications comparing untreated Cushing's syndrome to treated Cushing's disease using two-sided Fisher's exact test; IUGR = intrauterine growth retardation, IUFD = intrauterine fetal demise.

## DISCUSSION

- Given the increased risk of maternal and foetal complications from untreated Cushing's disease, treatment is usually justified during pregnancy.
- The goal of treatment is to reduce urinary free cortisol to the upper part of normal observed in pregnancy.
- The timing of surgical intervention has been recommended between 12-29 weeks. The second trimester is considered optimal as anaesthesia given in the first trimester carries an increased risk of spontaneous abortion, however anaesthesia in the third trimester carries an elevated risk of premature labour.

