# CUSHING`S DISEASE: REVERSIBILITY OF GLUCOSE HOMEOSTASIS ALTERATIONS AND IMPROVEMENT IN INSULIN RESISTANCE INDICES FOLLOWING A SUCCESSFUL, TRANSSPHENOIDAL SURGERY.

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## INTRODUCTION:

Cortisol excess in Cushing's disease(CD) leads to glucose homeostasis alterations and increased cardiovascular risk.

## AIM OF THE STUDY:

1.To assess the reversibility of glucose homeostasis alterations and dynamics of inflammatory and coagulation parameters after the successful transsphenoidal surgery(TSS) for CD. 2.Analysis of the early improvement in insulin resistance (IR) indices following TSS.

## METHODS:

The group consisted of 26 patients (22 women and 4 men; aged 41.5±13.3) with early remission of CD. Anthropometric parameters, glucose and insulin levels during an oral glucose tolerance test (OGTT), HbA1c, hsCRP, fibrinogen, and D-dimers were assessed prior to, and 3 months after TSS. HOMA-IR, QUICKI, and Matsuda indices were calculated. Patients previously diagnosed with diabetes were assessed exclusively for fasting glucose and HbA1c.

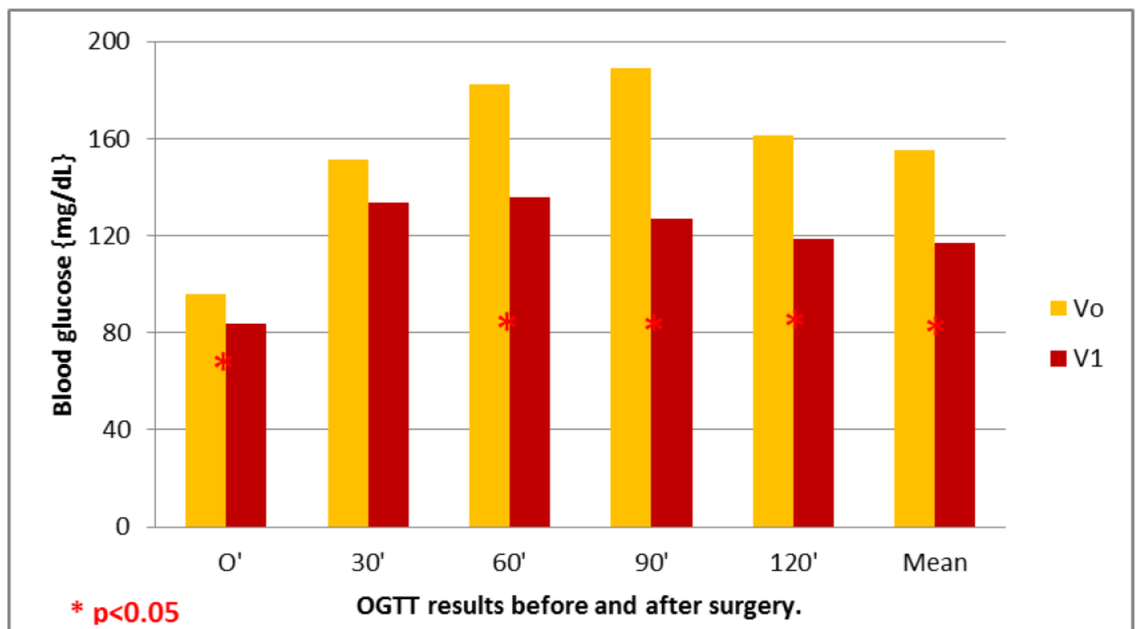
## RESULTS:

Four patients(15.4%) had been diagnosed with diabetes prior to CD confirmation. Five patients(19.2%) were diagnosed with diabetes based on OGTT results prior to surgery. Ten patients(38.5%) were diagnosed with impaired glucose tolerance. A significant decrease in OGTT parameters was confirmed: fasting blood glucose (95.9mg/dL±17.4 vs 83.8mg/dL±13.4, p<0.05), mean blood glucose (155.4mg/dL±34.1 vs 117.3mg/dL±21.6, p<0.0001), 60-minute glucose (182.6mg/dL±45 vs 135.8±30.6, p<0.001), 120-minute glucose (161.5mg/dL±52.2 vs 118.7mg/dL±33.9, p<0.05). The Matsuda index and QUICKI improved significantly (2.8±1.8 vs 5.2±3.6, p<0.01 and 0.32±0.03 vs 0.35±0.04, p<0.05, respectively). Three months after TSS decrease in BMI and reduction in waist and hip circumference were not significant. No differences were observed with regards to mean, fasting and 120-minute insulin levels, HbA1c, HOMA-IR, hsCRP, D-dimers,fibrinogen.

**Table 1.** Comparison of waist and hip circumferences, mean glucose concentrations and IR indices before and 3 months after transsphenoidal surgery for CD.

| Parameter | Before surgery | 3 months after surgery | p |
|---|---|---|---|
| Waist (cm) | 109.9±18.6 | 106±17.9 | p=0.45 |
| Hip (cm) | 108.4±16 | 104±13.8 | p=0.3 |
| Mean glucose (OGTT) (mg/dL) | 155.4±34.1 | 117.3±21.6 | **p<0.001** |
| QUICKI | 0.319±0.02 | 0.347±0.04 | **p<0.01** |
| Matsuda index | 2.82±1.8 | 5.2±3.6 | **p<0.01** |
| HOMA-IR | 4.16±2.5 | 2.9±2.9 | p=0.45 |

**Figure 1.** OGTT results before and after surgery




## CONCLUSIONS

1.Three months following successful TSS for CD significant decrease in fasting, mean and 120-minute OGTT glucose levels could already be seen. 2. The Matsuda index and QUICKI might be more sensitive IR indices in the early postoperative period compared to commonly used HOMA-IR. 3.To demonstrate improvement in anthropometric parameters, insulin levels during OGTT, inflammatory and coagulation parameters, a longer follow-up may be required.

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