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Impact of HbA1c after anatomical enucleation of prostate in patients with hypotestosteronaemia and poor diabetic control

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Introduction

BPH is a common condition that affects men over the age of 50 and can cause lower urinary tract symptoms, with nocturia being particularly troublesome as it can negatively impact health and quality of life by disrupting sleep. Nocturia has been linked to various conditions, including cardiac disease, type 2 diabetes mellitus, and metabolic syndrome.

Recent research has identified sleep disturbances as significant risk factors for type 2 diabetes mellitus, with difficulty initiating sleep increasing the risk by 55% and difficulty maintaining sleep increasing the risk by 74%. Lower urinary tract symptoms have also been found to be strongly correlated with testosterone deficiency (TD), which is prevalent in approximately one-third of men with obesity, type 2 diabetes mellitus, or metabolic syndrome. The causal relationship between testosterone deficiencies and type 2 diabetes mellitus is still unclear, but previous studies have shown that testosterone replacement therapy can improve blood sugar control and reduce insulin resistance. Surgical interventions, such as anatomical endoscopic enucleation of prostate (AEEP) [1], have been found to effectively improve nocturia and LUTS [2], which may have implications for type 2 diabetes mellitus.

Methods and Materials

We retrospectively evaluated patients who underwent AEEP between January 2019 to December 2020 at single medical center, then selected those who with type 2 DM as our study populations. Baseline patient demographics including testosterone level, HbA1c, nocturia, and postoperative data, with HbA1c every 6 months for 1.5 years, testosterone level and times of nocturia were collected. Additionally, we conducted subgroup analysis of patients with pre-operative hypotestosteronemia (defined as testosterone level < 3.0 ng/ml) and high HbA1c (>6.5). Paired sample T test and Wilcoxon signed rank test were used to compare preoperative and postoperative data.

Results

Table1. baseline characteristics of Patient with DM and hypotestosteronemia

Patient with Diabetes mellitus (n=31)	
	Mean ± SD or n (%)
Age, year	72.81±9.38
Height, cm	165.00±5.82
Weight, kg	69.82±12.17
BMI, kg/m2	25.64±4.87
Prostate volume, ml	41.33±17.78
Preop testosterone level, ng/mL	3.82±1.66
Preop HbA1c	6.90±1.05
Preop PSA level, ng/mL	2.65±1.14
TG, mg/dL	134.13±80.50
LDL, mg/dL	79.29±21.53
Cholesterol, mg/dL	163.71±34.64
Hypertension	21(68)
Old CVA	2(6)
Parkinson disease	3(10)
SD: standard deviation, BMI: Body mass index, CVA: cerebrovascular accident TG: triglycerides, LDL: low-density lipoprotein	

Initially, a total of 294 patients underwent AEEP, and we enrolled 32 patients with type 2 DM in our study. The patients' baseline characteristics showed in Table 1. No significant difference between pre-operative and post-operative HbA1c was seen. Similar finding was noted in patients with pre-operative HbA1c>= 6.5, with no statistical significance between pre-operative and post-operative HbA1c. A noteworthy finding was in the results from the subgroup of patients with pre-operative low testosterone level and HbA1c>= 6.5 %.

Statistically significant differences ($p<0.05$) between the pre-operative and post-operative HbA1c, at 6, 12 and 18 months were noted (Table 2.). The preoperative and postoperative times of nocturia also have statically significantly difference in the entire study population and subgroup analysis.

Table 2. changing of pre-op and post op HbA1C

	N	Pre-op HbA1c(%) mean,SD	Post-op HbA1c(%) mean,SD	p
Post-op 6 months f/u	8	7.49 ± 1.08	6.58 ± 0.43	0.021*
Post-op 12 months f/u	8	7.86 ± 1.27	6.80 ± 0.82	0.025*
Post-op 18months f/u	9	7.74 ± 1.25	6.63 ± 0.53	0.017*

Discussion

Our study is the first to demonstrate that AEEP can improve HbA1c status in hypotestosteronemic men with type 2 DM . This finding has important clinical implications and suggests that surgical intervention, in addition to medication and lifestyle modifications, can be a feasible approach for controlling DM. Further larger-scale studies and data collection are necessary to validate our results. Previous studies have demonstrated that TRT (testosterone replacement therapy) can improve metabolic status and HbA1c levels in diabetic men with TD (testosterone deficiency). However, there are conflicting results regarding whether TRT can improve glycemic status in hypogonadal men. Recently, Y-R Li et al. (2022) reported that endoscopic enucleation of the prostate could increase testosterone levels in hypotestosteronemic patients, using a research method similar to ours. Our research findings are consistent with a study by Y-R Li et al. who reported that endoscopic enucleation of the prostate can increase testosterone levels in hypotestosteronemic patients.

The limitations are the study's small sample size and the lack of information regarding diet and lifestyle habits. The possible cause is that few patients follow up DM at medical center, so we can only get HbA1c and lipid profile data according to limited medical record.

Conclusions

- Our study demonstrated that AEEP can improve HbA1c levels in hypotestosteronemic men with type 2 diabetes.
- We also found that AEEP led to a significant decrease in nocturia episodes, which may lead to better sleep quality and further correction of HbA1c levels.
- Our findings suggest that surgical intervention can be a viable approach for controlling diabetes, in addition to medication and lifestyle modifications.

References

1. Lin YH, Chang SY, Tsao SH, Hou CP, Chen CL, Lin WC, Tsui KH, Juang HH. Anterior fibromuscular stroma-preserved endoscopic enucleation of the prostate: a precision anatomical approach. World J Urol. 2022 Dec 30. doi: 10.1007/s00345-022-04270-2. Epub ahead of print. PMID: 36585497.
2. Li YR, Tsao SH, Chen CL, Hou CP, Tsui KH, Juang HH, Lin YH. Endoscopic Enucleation of Prostate Could Increase Testosterone Levels in Hypotestosteronemic Patients with Bladder Outlet Obstruction. J Clin Med. 2022 Nov 17;11(22):6808. doi: 10.3390/jcm11226808. PMID: 36431285; PMCID: PMC9696526.