

## EFFECT OF SMOKING CESSATION ON OVERACTIVE BLADDER SYMPTOMS IN ADULTS: A PILOT STUDY

### Hypothesis / aims of study

Smoking has been associated with a higher risk of lower urinary tract symptoms in women and men in some studies (1,2). Currently, there is no evidence that documents the effect of smoking cessation on lower urinary tract symptoms. Therefore, we sought to determine the effect of smoking abstinence in adults with overactive bladder (OAB) symptoms who were participating in a smoking cessation trial. We hypothesized that smoking abstinence would be associated with improvements in OAB individual symptoms and overall symptom score.

### Study design, materials and methods

A subset of adult participants in a comparative effectiveness trial was selected for this secondary data analysis. 202 women and men ages 18-70 years were randomized to a 6-week trial comparing: a) very low nicotine content cigarette used alone, b) low nicotine content cigarette in combination with a 21 mg nicotine patch, or c) patch alone. Eligibility criteria for the parent study and substudy were: smoking 10-40 cigarette daily for 1 year; in good physical and mental health; having at least one OAB symptom (e.g., urinating 9 or more times per day; getting up to urinate 2 or more times per night; rushing to the toilet sometimes or more often; or leaking before they get to the toilet sometimes or more often); no regular use of other tobacco or nicotine products; not pregnant or nursing; and not on anti-incontinence medication, alpha-blocker, or 5-alpha reductase inhibitor. Participants completed a history, height, and weight, and the International Consultation on Incontinence Questionnaire-Overactive Bladder (ICIQ-OAB) at baseline and at 12 weeks (6 weeks after completion of the trial intervention). Smoking status was determined by self-report using data from Week 6 to Week 12 and defined as abstinent ( $\leq 3$  puffs of a cigarette) versus relapsed ( $\geq 4$  puffs of a cigarette). Outcomes include individual OAB symptoms and overall ICIQ-OAB score.

Descriptive statistics, t-tests, Fischer's exact test, and multiple logistic regressions controlling for baseline values, sex, age, baseline BMI, change in BMI, and diuretic use were used to analyse the effect of smoking cessation on OAB symptoms and overall score.

### Results

Of the 202 participants who were enrolled into the study, 96 met criteria for the secondary data analysis. Of these, 57 participants (59%) completed the study and were included in the present analysis. On average, they were age  $51.6 \pm 9.9$  years, 64.9% female ( $n=37$ ), and smoked an average of  $20.7 \pm 9.1$  cigarettes/day. Men smoked significantly more cigarettes per day, and had a higher pack years ( $45.6 \pm 28.0$  vs  $30.7 \pm 15.3$ ,  $p=.037$ ) than women, respectively (Table 1). Men also tended to have a higher proportion of urinary frequency at baseline than women. There were no differences between men and women in age, BMI, or other lower urinary tract symptoms. At 12 weeks, 13 (22.8%) participants were abstinent and 44 (77.2%) had relapsed. Compared to those who relapsed, those who were abstinent were more likely to have an improvement in urinary frequency ( $p=.042$ ). However, abstinence was not associated with improvements in urgency, nocturia, urgency urinary incontinence. There was no change in overall ICIQ-OAB scores for those who were abstinent versus who relapsed ( $4.6 \pm 0.5$  vs  $4.3 \pm 0.3$ , respectively,  $p=NS$ ). Table 2 presents an analysis of individual symptom changes at 12 weeks for those who were abstinent versus who had relapsed.

### Interpretation of results

The hypothesis was only partially supported. Participants who were able to maintain smoking abstinence were able to significantly reduce their urinary frequency. There were no significant effects on other OAB symptoms (urgency, nocturia, and urgency urinary incontinence) or overall ICIQ-OAB scores. The results are influenced by the small sample size and the low prevalence of some symptoms. It is also possible that it may take longer for OAB symptoms to improve following smoking cessation.

### Concluding message

Smoking cessation may improve urinary frequency in smokers who void more than 9 times per day. However, further trials with larger sample sizes are needed to determine the effect of smoking abstinence on overactive bladder symptoms.

Table 1: Baseline Characteristics of the Subsample

Characteristic	Overall (N=57)	Women (n=37)	Men (n=20)	P value
Age	$51.6 \pm 9.9$	$51.1 \pm 10.8$	$52.6 \pm 8.1$	.566
BMI	$29.7 \pm 6.0$	$29.5 \pm 6 \pm 8$	$30.2 \pm 4.1$	.600
Cigarettes/Day	$20.7 \pm 9.1$	$18.0 \pm 6.2$	$25.0 \pm 11.3$	.006
Pack-years	$36.4 \pm 22.1$	$30.6 \pm 15.3$	$45.6 \pm 28.0$	.037
Voiding $\geq 9$ /day	26(40)	14 (38)	12 (60)	.055
Nocturia $\geq 2$ /night	17(30)	10 (27)	7 (35)	.416
Rushing to the toilet $\geq$ sometimes	32(57)	24 (65)	8(40)	.436
Leaking before reaching the toilet $\geq$ sometimes	11(19)	9 (24)	2 (10)	.309

Overall Score*	ICIQ-OAB	5.0±2.0	5.2±2.0	4.6±1.1	.294
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Expressed in mean (standard deviation) or number (percentage)

\*Total score can range from 0-16

Table 2: Change in Overactive Bladder Symptoms by Smoking Status at 12 Weeks

Change In Symptom	Abstinent (n=13)			Relapsed (n=44)			Significance <i>p-value</i>
	Improved	No Change	Worsened	Improved	No change	Worsened	
Urinary Frequency	5(38)	3(23)	5(38)	4(9)	23(52)	17(39)	.004
Urgency	--	9(69)	4(31)	5(12)	24(55)	15(33)	.578
Nocturia	3(23)	10(77)	--	6(14)	29(66)	9(20)	.174
Urgency Urinary Incontinence	2(15)	8(62)	3(25)	8(18)	30(68)	6(14)	.728

Expressed in number (percentage)

#### References

1. Tähtinen RM, Auvinen A, Cartwright R, Johnson TM 2nd, et al. Smoking and bladder symptoms in women. *Obstet Gynecol*, 2011;118:643-648.
2. Koskimäki, J, Hakama, Huhtala H, & Tammela, TLJ. Association of smoking with lower urinary tract symptoms. *J Urol* 1996;1159:1580-1582.

#### Disclosures

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