

Effect of Tobacco Cessation on Weight in a Veteran Population

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Abstract

Introduction/Objectives: Weight gain concerns remain a barrier to tobacco cessation. Literature suggests that weight gain can occur after stopping tobacco, but continuing tobacco can have far worse outcomes. Limited information is available regarding weight gain in military personnel. The objective of this study was to evaluate weight change in veterans that stopped tobacco for a minimum of 12 months enrolled in a pharmacist managed telephone tobacco cessation clinic (PMTTCC). **Methods:** A retrospective analysis of veterans who had been tobacco-free for 12 months enrolled in a PMTTCC were included in this analysis. Primary outcomes were change in weight (kg) and body mass index (BMI) from baseline. Descriptive data were utilized where appropriate and paired *t*-tests were utilized for the primary outcomes. **Results:** Seventy-seven patients were screened and 10 were excluded. Sixty-seven veterans met inclusion criteria and were mostly male (91%, *n*=61) and Caucasian (74.6%, *n*=50). At 12 months post cessation, the mean weight gain was (1.81 kg ± 6.83, *P*=.03) and BMI (0.51 ± 2.23 kg/m², *P*=.06). **Conclusions:** Veterans appeared to have minimal weight gain despite statistical significance and no statistical change with BMI after 12 months of being tobacco-free. Results suggest that the long-term weight gain is minimal, and a comprehensive tobacco cessation program can be helpful to improve weight outcomes.

Keywords

smoking, disease management, lifestyle change, pharmacy, prevention, program evaluation

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Introduction

Tobacco use disorder (TUD) is a chronic, relapsing disease composed of chemical dependence as well as habitual and psychological associations. Due to the complexity of the disease, tobacco cessation is difficult, comprising of many barriers to cessation, including weight gain. Average weight gain post-cessation varies depending on the study.^{1–3} In general, continued tobacco users can still gain an average weight of about 4–5 lbs (pounds) versus 7–19 lbs for former tobacco users, with most weight gained by 6-months of cessation.^{1–3} A small percentage, approximately 10%, that stop tobacco use can gain more than 30 lbs.⁴ While weight gain can hamper tobacco cessation success, the health risk posed by weight gain is marginal compared to continued tobacco use.² With that said, weight gain concerns can play a role in cessation outcomes.

Various risk factors may be associated with higher weight gain. African Americans may be more likely to gain more weight after quitting tobacco, as are women, heavy

smokers (>25 cigarettes/day), and those below the age of 55.⁵ It is possible all these risk factors may play a role, but more likely increased caloric intake after cessation is the main culprit to significant weight gain.⁶ Regardless, a comprehensive approach to tobacco cessation that includes counseling and focuses on individualized triggers (e.g. weight gain concerns) can increase success and prevent lapses/relapses in the cessation process.⁵

In addition to counseling, medications such as bupropion or nicotine replacement therapy (NRT), especially the gum and lozenge, have shown to delay weight gain after

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cessation.⁷⁻⁹ Also, tobacco cessation programs involving both medications for tobacco use disorder (MTUD) and behavioral weight treatment showed increased abstinence and reduced weight gain in the first 3 months compared to patients who received smoking treatment alone.¹⁰ Another meta-analysis found that NRT or other pharmacotherapy may also delay weight gain.¹ Weight gain in veterans after tobacco cessation has limited data. One study looked at military men and weight changes, and found steady weight gain over a course of 13 weeks.⁴ Given the short duration of the study, it is unknown if weight is stabilized at 13 weeks or weight continues to increase over time.⁴ This analysis attempts to investigate potential weight change after 12 months of being tobacco-free in veterans enrolled in a tobacco cessation clinic at the Veterans Affairs San Diego Healthcare System (VASDHS).

Methods

A retrospective chart review comparing 1-year weight changes to baseline was conducted for veterans enrolled in the Pharmacist Managed Telephone Tobacco Cessation Clinic (PMTTCC) between January 2010 and December 2013. The PMTTCC integrates MTUD and behavioral counseling previously described.^{11,12} Patients who were successful in maintaining 1-year tobacco-free were included in the analysis. Patients without documented baseline and 12 months post-cessation weight (kg) and body mass index (BMI) were excluded from the study. Patients who were also enrolled in other tobacco cessation programs or had documented participation in weight, exercise, or nutrition programs or group tobacco cessation visits were excluded from the study.

The primary endpoints were change in weight (in kg) and BMI (kg/m^2) after 12 months of being tobacco-free. Baseline weight and BMI were defined as 3-months prior up to tobacco quit date. Twelve-month follow-up weight and BMI were defined as 12 months to 15 months post tobacco quit date.

IRB approval was granted for this study. Descriptive statistics were utilized for baseline demographics. For the primary outcomes, paired *t*-tests were used to compare (1) change in weight and; (2) BMI. Statistical analysis was completed utilizing SPSS Statistical Software version 22.0.

Results

Seventy-seven veterans were tobacco-free at 12 months; however, only 67 met the inclusion criteria. Of the ten patients who were excluded, 6 did not have documentation of post-enrollment weight and BMI, and 4 were enrolled in other tobacco cessation programs. The patients included in the study were predominantly male and Caucasian (Table 1). Over 91% ($n=61$) were on pharmacotherapy for cessation (Table 1).

Table 1. Baseline Demographics.

Mean age in years (range)	55.6 (28–78)
Gender, n (%)	
Male	61 (91)
Female	6 (9)
Race, n (%)	
Caucasian	50 (74.6)
African American	8 (11.9)
Asian	1 (1.5)
Pacific Islander	1 (1.5)
Other	2 (3)
Comorbidities, n (%)	
Asthma	2 (3)
Chronic obstructive pulmonary disease	19 (28)
Congestive heart failure	5 (7.5)
Diabetes type 2	17 (25.4)
Coronary artery disease	10 (14.9)
Dyslipidemia	39 (58.2)
Hypertension	47 (70.1)
Lung cancer	2 (3)
Pharmacotherapy, n (%)	
Combination therapy	35 (52.2)
Patch	11 (16.4)
Gum	6 (9)
Lozenge	4 (6)
Bupropion	2 (3)
Varenicline	1 (1.5)
Inhaler	1 (1.5)
Nasal spray	1 (1.5)
Smoking data, mean (range) \pm SD	
Years smoked	33.7 (4–60) \pm 14.1
Cigarettes/day	29.0 (2–80) \pm 15.1

SD, standard deviation.

For the primary outcome, patients had a statistically significant increase in weight change from baseline ($1.81 \text{ kg} \pm 6.83$, $P=0.03$) with trends of increase with BMI ($0.51 \pm 2.23 \text{ kg}/\text{m}^2$, $P=0.08$) (Table 2). A total of 37.1% ($n=26$) lost weight. No gender differences were observed.

Discussion

A combination of MTUD and behavioral counseling is the most effective treatment for tobacco cessation and appeared to demonstrate some benefit in delaying weight gain.⁵ As reported previously, patients that continued to use tobacco may have an average weight gain of 4-5 lbs (1.81 to 2.3 kg) and similar to the patients enrolled in the PMTTCC who were able to remain abstinent for 12 months.² The primary weight outcome of this study was significantly different, with a mean increase of 1.81 kg , which may not be clinically meaningful, especially when this might be a similar weight change for continued tobacco users. In addition, more than one-third lost weight at 12 months.

Table 2. Change in Weight and Body Mass Index (BMI) after 12 months of Tobacco-Free.

Variable	Baseline, Mean \pm SD	12 months, Mean \pm SD	Mean difference \pm SD	P-value
Weight (kg)	91.77 \pm 20.88	93.58 \pm 21.04	1.81 \pm 6.83	.03
BMI (kg/m ²)	29.53 \pm 5.94	30.04 \pm 6.25	0.51 \pm 2.23	.06

SD, standard deviation.

A meta-analysis that looked at weight changes had higher weight gain at 12 months with mean weight gain 4.67 kg.¹ The PMTTCC offers a unique model of clinical pharmacist specialists providing pharmacotherapy and behavioral counseling that have benefit in preventing weight gain.^{1,11,12} The behavioral counseling often entails strategies for mitigating weight gain concerns, which include assisting with reduced caloric intake, indirectly affecting post-cessation weight gain.^{11,12} Weight gain can be a barrier for military personnel; however, this analysis provides us more information about veterans.¹³

A study in active military personnel demonstrated an average weight gain of 6.4 lbs (–2.91 kg) after just 13-weeks of tobacco cessation, significantly higher than this analysis.⁴ With a combination of counseling and MTUD prescribing, an integrated clinic like PMTTCC may be better equipped to delay and prevent weight gain up to 12 months post-cessation.

There were limitations to this study. The sample size was small and mostly male, which makes it difficult to extrapolate to the general population. Although no differences were seen across genders, further analysis will be needed to confirm results. The study did not isolate interventions (pharmacotherapy, counseling, or a combination of the two) that may have varying degrees in preventing weight gain. Veterans in the study that maintained abstinence of at least 12 months had over 90% prescribed pharmacotherapy for cessation, likely also delaying weight gain. PMTTCC offers individualized counseling and may not have provided weight gain counseling to all patients, so if this was offered to all patients, the change in weight might be further reduced.

Despite the lack of ability to differentiate the various interventions' effects on post-cessation weight gain, the PMTTCC offers value in providing evidence-based practice and a combination of interventions effective in preventing and delaying weight gain. Lastly, this was a retrospective chart review, which made it difficult to determine if patients engaged in external activities may have confounded the results, such as specific diet improvements (e.g., reduced caloric intake), increased moderate-intensity exercise or participation in external tobacco cessation treatment.

Conclusion

Veterans who stop tobacco use for a minimum of 12 months and receive both medications for tobacco use disorder

(MTUD) and behavioral counseling demonstrated minimal weight gain post-cessation. This weight change appears to be lower than previously examined and provides support for a tobacco cessation program that offers MTUD and behavioral counseling, like the Pharmacist Managed Telephone Tobacco Cessation Clinic (PMTTCC).

Declaration of Conflicting Interests

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