



Smoking Cessation Medicine Associated with Emergency Department Visits

Gregory Adams, Shetal Patel and Charles L Emerman*

Department of Emergency Medicine, Case Western Reserve University, USA

Abstract

Introduction: A significant portion of the population continues to smoke despite well-known adverse consequences. The Emergency Department has been identified by national organizations as an appropriate place to initiate smoking cessation treatment.

Methods: We utilized the Explorys database to identify smokers who utilized the Emergency Department for the years 2016 to 2020. We queried the database for smoking cessation medications (MAT) including varenicline, bupropion, and nicotine replacement therapy. We identified characteristics associated with treatment.

Results: We reviewed 427,690 visits by adult smokers during the study period. Eight percent were over the age of 65 years. Twenty-one percent were prescribed smoking MAT. Patients prescribed MAT were more likely to be female and have asthma or COPD. African Americans were more frequently prescribed MAT than other groups. Self-pay patients were less frequently prescribed MAT. Patients with an acute exacerbation of asthma or COPD were prescribed MAT more often than those with those diagnoses without an acute exacerbation.

Conclusion: Within the limitations of this database, about 1/5 of ED smokers are prescribed MAT. Additional work on increasing this percentage is warranted.

Introduction

Tobacco is the most abused substance in the United States. In 2015 it was estimated that the prevalence of cigarette use was about 15% of the United States population [1]. The prevalence of tobacco use among patients who visit the ED is widely variable among the studies with numbers ranging from 26% to 41% [2]. One survey identified that about 70% of smokers in the US wanted to quit, about 55% attempted, however only about 7% successfully quit [3]. Various forms of MAT for smoking are available and result in improved cessation rates. A prior review found that MAT along with counseling led to a 25% abstinence rate at 1 year [4]. A meta-analysis found that the use of MAT almost doubled the rate of cessation at 2 to 8 years after starting [5]. Prior work has found that many Emergency Department patients indicate a desire to quit over the following 6 months [6].

A number of studies have investigated the role of emergency department intervention in smoking cessation. Prior evidence has indicated that interventions, generally involving trained counselors using motivational based interviewing techniques with or without medication assisted therapy leads to successful cessation [7]. Several recent meta-analyses have found that emergency department-based intervention can lead to sustained abstinence up to 12 months [8,9]. Not all studies have found a benefit to the initiation of MAT in the ED. One study placed subjects in two groups with one receiving a standard smoking cessation brochure and the other receiving Medication Assisted Therapy (MAT) along with other motivational resources [10]. There was no difference in the overall decrease in cessation (13.2% control vs. 14.7% enhanced). In another study, patients were randomized to two groups with one receiving an American Heart Association pamphlet with the other receiving MAT and intensive counseling [11]. The percentage of successful smoking cessation between the two groups was also similar at three months (10.4% control vs. 10.9% intervention). Based on evidence of the efficacy of ED initiated intervention, National emergency medicine organizations have advocated for tobacco control interventions to be initiated in the ED [12], providers in various settings have identified barriers to routine tobacco cessation counseling and intervention with six common themes involving lack of time, patient un readiness, inadequate resources, language and cultural barriers, patient non-compliance and inadequate cessation clinical skills by the provider [13]. Similarly, emergency physicians identify barriers related to time and

OPEN ACCESS

*Correspondence:

Charles L Emerman, Department of Emergency Medicine, Case Western Reserve University, BG355, 2500 Metro Health Drive, Cleveland, Ohio 44109, USA,

E-mail: cemerman@metrohealth.org

Received Date: 11 Apr 2021

Accepted Date: 28 Apr 2021

Published Date: 05 May 2021

Citation:

Adams G, Patel S, Emerman CL. Smoking Cessation Medicine Associated with Emergency Department Visits. *Ann Clin Case Rep.* 2021; 6: 1945.

ISSN: 2474-1655

Copyright © 2021 Charles L Emerman. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

training as barriers to smoke cessation counseling [14]. While many emergency physicians ask about smoking, only about half of the time does that then result in cessation counseling [15]. Studies specific to the Emergency Department setting have identified that providers are hesitant to conduct this training [16].

Many of the studies noted above were single center-based interventions or surveys. Given the health importance of smoking cessation and the national recommendations it is important to understand how emergency physicians are performing in initiating smoke cessation MAT. The purpose of our study was to evaluate a large database to assess recent performance in prescribing MAT.

Methods

The Explorys database is an IBM Watson Health product that utilizes a gateway behind each participating organization's firewall. This collects a variety of data from the electronic health record, laboratory, and billing systems which is then de-identified and sent to the Explorys servers. The data then is standardized and available for searches using a cohort-based approach. The database contains information on millions of patients although the specific contribution of each health care system is not available. Prior work has validated the reliability of this approach [17].

We queried the Explorys database for Emergency Department encounters from 2016 to 2020 listing a finding of smoking. So that we could identify prescribing by emergency providers, we excluded patients who were admitted or placed on observation status. Based on the age brackets available in the database we selected among adults age 20 years of age or older. The construct of the database did not allow us to specify any adult over the age of 18 without also including younger teenagers. The racial and gender characteristics are limited to those available in the database. We did not distinguish between the type and extent of smoking. Each study year from 2016 to 2020 was queried separately and then the results were summed. The database was queried for prescriptions for bupropion, varenicline, and nicotine replacement therapy. We evaluated differences in baseline characteristics between those who were or were not prescribed one of these products. Those characteristics were limited to those available for selection in the database. We also evaluated differences in prescribing rates over the course of the 5-year study period.

Data was analyzed using Chi-square testing for categorical data. A Pearson's correlation coefficient was calculated for changes in prescribing over the study period. The data is presented as the percentage and 95% confidence interval (in brackets). Our Institutional Review Board deemed this to not be human subject research requiring their approval.

Results

We evaluated 427690 smokers of whom 91.2% (91.1 to 91.3) were from 20 to 65 years of age. There were more male (54.5% (54.4 to 54.6)) than female patients. Nineteen (18.9 to 19.1) percent identified as African American and 11.8 (11.7 to 11.9) percent identified as Hispanic. A history of COPD was present in 10.2 (10.1 to 10.3) percent of the patients and 19.4 (19.3 to 19.5) percent had a history of asthma.

Overall, 20.6 (20.5 to 20.7) percent of patients were prescribed MAT. Fifty-three percent of the prescriptions were for nicotine replacement products, 49% were for bupropion, and 29 percent were for varenicline outlining that some patients received prescriptions for

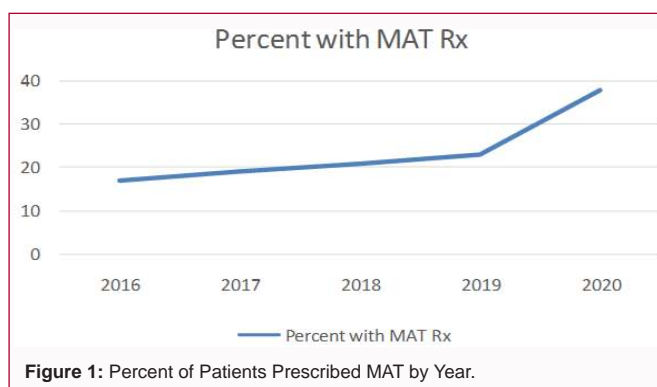


Figure 1: Percent of Patients Prescribed MAT by Year.

Table 1: Comparison of patients prescribed or not prescribed MAT.

	Rx for MAT	No Rx for MAT	
Age			P<0.00001
20-65 years	91%	92%	
Over 65	10%	8%	
Male	45%	57%	P<0.00001
COPD diagnosis	21%	11%	P<0.00001
Asthma diagnosis	25%	18%	P<0.00001
Hispanic ethnicity	5%	14%	P<0.00001
African American	22%	18%	P<0.00001
Self-pay insurance	24%	30%	P<0.00001

more than one product.

The patients prescribed MAT were more likely to be in the younger age group and female. Hispanic identifying patients were less likely to receive MAT. African American patients were more likely receive MAT. Patients with COPD or asthma were more likely to receive MAT. Patients who were self-pay were less likely to receive MAT. Of the patients with COPD, 35.4% presented with an acute exacerbation. There was a significant increase in the prescribing of MAT to patients with an acute exacerbation (54%) versus those without an acute exacerbation (24%, $p<0.00001$). Twenty-Four percent of the asthmatic patients presented with an acute exacerbation. Those with an acute exacerbation were more likely (62%) to receive MAT than those without an acute exacerbation (57%, $p<0.00001$).

We found a trend towards more frequent prescribing of MAT from 2016 to 2020 although this was not statistically significant ($R=0.86$, $p=0.06$).

Discussion

We have found that there may be additional opportunities to expand the Emergency Department prescribing of MAT. We are not aware of similar large database analyses reporting on actual prescribing of MAT in the Emergency Department. There have been multi-center surveys assessing provider's willingness to prescribe MAT. Once such multi-center survey found that prescribing for MAT was not an appealing option for emergency providers, reporting that about 1/3 were willing to prescribe, although they were willing to ask about smoking status and refer for treatment [15]. While many emergency physicians identify health promotion as part of their responsibility, they also are not confident in their ability to change patient behavior [18]. Many ED patients are ready to change presenting either in the contemplative or preparatory stages [19]. Further, patients rate their

satisfaction with their ED visit higher when such interventions are offered [20]. Although a small study, one survey found that only about ½ of ED patients who smoked were advised to quit and less than 10% were offered cessation assistance [21]. Educational interventions have been shown to increase tobacco counseling by emergency physicians. In one such study, a one-hour lecture increased the likelihood that emergency physicians would ask about smoking, refer patients to counseling, and document smoking cessation counseling [22].

Prior studies have found that when the ED visit was due to a smoking related condition, physicians were more likely to engage in counseling [16]. This is similar to our results demonstrating that patients with lung disease were more likely to be prescribed MAT, particularly if they were there for an acute exacerbation of that disease. Women were more likely to receive MAT than men, consistent with other data reporting that cessation advice is more likely to be given to women [23]. This same study found that Hispanic or Latino participants were less like to receive counseling, similar our findings. Also, in that survey self-pay patients were less likely to receive smoking cessation advice, in line with our findings. We have found that African American patients were more likely to receive MAT. This is not consistent with prior studies, although it is consistent with data that African American patients make more attempts to quit per year than other groups [24,25].

Emergency Department based studies of varying interventions have not found a difference in success rates based on age, gender, race, or insurance status [10]. In a prior study from our group, we did not find a difference in smoking cessation success based on age or gender [26]. We cannot determine from our data the reason behind the differences in MAT prescribing patterns. This database cannot differentiate between differences in prescriber patterns or patient acceptance of MAT prescriptions.

Limitations

This database query is reliant on the accuracy of the data inputted by the parent organizations. We cannot verify the accuracy of the smoking history. As the percent of ED patients reported to have a smoking history is on the low end of what has been provided in other studies, we may overestimate how many smokers received MAT. Whether or not physicians who document smoking history are more likely to prescribe MAT is not something that can be determined by this database. Bupropion can be used for other indications aside from smoking. We cannot determine the reason for the prescription from this database. We saw a lower number of ED visits in the database in 2020. We cannot determine if this is from lower participation by the organizations that contribute data, or some other effect related to that particular year.

Conclusion

Within the limitations of this database we find that there may be additional opportunities for emergency physicians to assist patients with smoking cessation. Further research in this area is warranted.

References

1. Mattingly DT, Hirschtick JL, Meza R, Fleischer NL. Trends in prevalence and sociodemographic and geographic patterns of current menthol cigarette use among U.S. adults, 2005-2015. *Prev Med Rep.* 2020;20:101227.
2. Smith PM. Tobacco use among emergency department patients. *Int J Environ Res Public Health.* 2011;8(1):253-63.
3. Babb S, Malarcher A, Schauer G, Asman K, Jamal A. Quitting Smoking among adults-United States, 2000-2015. *MMWR Morb Mortal Wkly Rep.* 2017;65(52):1457-64.
4. Tonnesen P. Smoking cessation: How compelling is the evidence? A review. *Health Policy.* 2009;91(Suppl 1):S15-25.
5. Etter JF, Stapleton JA. Nicotine replacement therapy for long-term smoking cessation: a meta-analysis. *Tob Control.* 2006;15(4):280-5.
6. Bernstein SL, Boudreaux ED, Cabral L, Cydulka RK, Schwegman D, Larkin GL, et al. Nicotine dependence, motivation to quit, and diagnosis among adult emergency department patients who smoke: A national survey. *Nicotine Tob Res.* 2008;10(8):1277-82.
7. Pelletier JH, Strout TD, Baumann MR. A systematic review of smoking cessation interventions in the emergency setting. *Am J Emerg Med.* 2014;32(7):713-24.
8. Lemhoefer C, Rabe GL, Wellmann J, Bernstein SL, Cheung KW, McCarthy WJ, et al. Emergency department-initiated tobacco control: Update of a systematic review and meta-analysis of randomized controlled trials. *Prev Chronic Dis.* 2017;14:E89.
9. Rabe GL, Wellmann J, Bagos P, Busch MA, Hense HW, Spies C, et al. Efficacy of emergency department-initiated tobacco control--systematic review and meta-analysis of randomized controlled trials. *Nicotine Tob Res.* 2013;15(3):643-55.
10. Bernstein SL, Bijur P, Cooperman N, Jearld S, Arnsten JH, Moadel A, et al. A randomized trial of a multicomponent cessation strategy for emergency department smokers. *Acad Emerg Med.* 2011;18(6):575-83.
11. Richman PB, Dinowitz S, Nashed AH, Eskin B, Sylvan E, Allegra C, et al. The emergency department as a potential site for smoking cessation intervention: a randomized, controlled trial. *Acad Emerg Med.* 2000;7(4):348-53.
12. Bernstein SL, Boudreaux ED, Cydulka RK, Rhodes KV, Lettman NA, Almeida SL, et al. Tobacco control interventions in the emergency department: A joint statement of emergency medicine organizations. *Ann Emerg Med.* 2006;48(4):e417-26.
13. Caplan L, Stout C, Blumenthal DS. Training physicians to do office-based smoking cessation increases adherence to PHS guidelines. *J Community Health.* 2011;36(2):238-43.
14. Prochazka A, Koziol-McLain J, Tomlinson D, Lowenstein SR. Smoking cessation counseling by emergency physicians: Opinions, knowledge, and training needs. *Acad Emerg Med.* 1995;2(3):211-6.
15. Walters EL, Reibling ET, Wilber ST, Sullivan AF, Gaeta TJ, Camargo CA, et al. Emergency department provider preferences related to clinical practice guidelines for tobacco cessation: A multicenter survey. *Acad Emerg Med.* 2014;21(7):785-93.
16. Vokes NI, Bailey JM, Rhodes KV. "Should I give you my smoking lecture now or later?" Characterizing emergency physician smoking discussions and cessation counseling. *Ann Emerg Med.* 2006;48(4):406-14.e1-7.
17. Pfefferle KJ, Gil KM, Fening SD, Dilisio MF. Validation study of a pooled electronic healthcare database: The effect of obesity on the revision rate of total knee arthroplasty. *Eur J Orthop Surg Traumatol.* 2014;24(8):1625-8.
18. Williams JM, Chinnis AC, Gutman D. Health promotion practices of emergency physicians. *Am J Emerg Med.* 2000;18(1):17-21.
19. Boudreaux ED, Baumann BM, Friedman K, Ziedonis DM. Smoking stage of change and interest in an emergency department-based intervention. *Acad Emerg Med.* 2005;12(3):211-8.
20. Bernstein SL, Boudreaux ED, American College of Emergency Physicians Smoking Cessation Task Force. Emergency department-based tobacco interventions improve patient satisfaction. *J Emerg Med.* 2010;38(4):e35-40.

21. Bock BC, Becker B, Monteiro R, Partridge R, Fisher S, Spencer J. Physician intervention and patient risk perception among smokers with acute respiratory illness in the emergency department. *Prev Med.* 2001;32(2):175-81.
22. Bernstein SL, Boudreaux ED, Cabral L, Cydulka RK, Schwegman D, Larkin GL, et al. Efficacy of a brief intervention to improve emergency physicians' smoking cessation counseling skills, knowledge, and attitudes. *Subst Abus.* 2009;30(2):158-81.
23. Kruger JSL, Kahende J, Frank E. Health care providers' advice to quit smoking, National Health Interview Survey, 2000, 2005, and 2019. *Prev Chroni Dis.* 2012;9.
24. Doolan DM, Froelicher ES. Efficacy of smoking cessation intervention among special populations: Review of the literature from 2000 to 2005. *Nurs Res.* 2006;55:S29-37.
25. Kulak JA, Cornelius ME, Fong GT, Giovino GA. Differences in quit attempts and cigarette smoking abstinence between whites and african americans in the United States: Literature review and results from the international tobacco control US Survey. *Nicotine Tob Res.* 2016;18(Suppl 1):S79-87.
26. Emerman C. Efficacy of routine emergency department counseling, intervention, and referral for achieving smoking cessation. *J Respir Med Lung Dis.* 2019;4(1):1042.