The Journal of Emergency Medicine, Vol. 45, No. 4, pp. 520–525, 2013
Published by Elsevier Inc.
Printed in the USA
0736-4679/$ - see front matter

http://dx.doi.org/10.1016/j.jemermed.2013.05.007

Original Contributions

FREQUENT EMERGENCY DEPARTMENT VISITS ARE MORE PREVALENT IN PSYCHIATRIC, ALCOHOL ABUSE, AND DUAL DIAGNOSIS CONDITIONS THAN IN CHRONIC VIRAL ILLNESSES SUCH AS HEPATITIS AND HUMAN IMMUNODEFICIENCY VIRUS

Arpi Minassian, PHD,*† Gary M. Vilke, MD,‡§ and Michael P. Wilson, PHD, MD‡§

*Department of Psychiatry, University of California San Diego, San Diego, California, †Center of Excellence for Stress and Mental Health (CESAMH), Veteran's Administration, San Diego, California, ‡Department of Emergency Medicine, University of California San Diego, San Diego, California, and §Department of Emergency Medicine Behavioral Emergencies Research Laboratory, San Diego, California
Reprint Address: Arpi Minassian, PHD, Department of Psychiatry, University of California San Diego, 200 West Arbor Drive, Mailcode 8620, San Diego, CA 92103-8620

☐ **Abstract—Background: Repeat users of Emergency Departments (ED), so-called "frequent visitors," place a substantial burden on limited ED resources. The illness features of frequent visitors have not been well defined, though chronic medical and psychiatric illness and substance abuse are implicated. Study Objectives: This study assessed whether chronic conditions such as hepatitis C (HCV) and human immunodeficiency virus (HIV) are more prevalent in frequent ED users compared to a viral condition with relatively less disability, hepatitis B (HBV). As a comparison, psychiatric complaints and alcohol abuse were also compared in frequent and non-frequent visitors. Methods: All visits to a university ED in a particular calendar year were retrospectively reviewed. Frequent visitors were defined as those who made four or more visits. Presenting complaints and past medical history were examined for HCV, HIV, HBV, psychiatric complaints, and alcohol abuse. Results: Frequent visitors accounted for 28% of all ED visits. HCV, HIV, and alcohol abuse were more prevalent in frequent visitors than non-frequent visitors. People with HBV comprised a small proportion of both groups. Frequent visitors with psychiatric complaints were more prevalent than those with HBV or alcohol abuse. Psychiatric history comorbid with alcohol abuse and HCV with alcohol abuse were more prevalent in frequent vs. non-frequent visitors. Conclusion: Although chronic hepatitis and psychiatric complaints are both implicated in frequent ED visits, patients with psychiatric complaints present to the ED more often. Patients with a "dual diagnosis" of psychiatric condition and alcohol abuse are likely to be frequent visitors. This population should be targeted for creative intervention strategies, both within and outside of the emergency system, that comprehensively screen for symptomatology and integrate mental health treatment with substance abuse interventions. Published by Elsevier Inc.**

☐ **Keywords—frequent visitors; hepatitis C; HIV; hepatitis B; psychiatric; substance abuse**

INTRODUCTION

Overcrowding in Emergency Departments (ED) is a significant public health problem and has been in part attributed to individuals who use ED services repeatedly (1). Much attention has focused on the sociodemographic characteristics of these "frequent visitors," who have been defined most often as patients with four or more visits in 12 months, although this definition has ranged widely in the literature from as few as two to as many as 12 visits (2–9). Frequent visitors tend to have low income and public insurance (8,9). Less formally characterized are the actual illness features of frequent

RECEIVED: 9 May 2012; FINAL SUBMISSION RECEIVED: 28 March 2013;
ACCEPTED: 1 May 2013

ED visitors, although it has been suggested that chronic conditions such as mental illness, substance abuse, and general "poor health" may be predictors of frequent ED use (4,7,10–12). A recent study additionally reported that frequent visitors were more likely to report lower levels of social support, higher levels of stress, and were more likely to have depressive symptoms (1).

A generally worse health status, or "poor health," can be reflective of numerous chronic health conditions, including but not limited to diabetes, cardiac, and pulmonary diseases, cancers, viral infections, and others. Among these, hepatitis C (HCV) and human immunodeficiency virus (HIV) infection are of interest because disability, substance abuse, and mental illness are especially prevalent in these diseases (13–17). Additionally, compared with another viral illness such as hepatitis B (HBV), HCV and HIV are associated with worse generalized health status, greater disability, and more frequent associated psychiatric illness (18–20). The focus of this study was to test many of the findings of previous literature on this topic, namely, to determine whether HCV and HIV (as examples of chronic conditions associated with decreased health-related quality of life, increased substance use, and mental illness) are specifically associated with frequent ED use. In accordance with previous research, we hypothesized that, in a given year of visits to an urban/suburban ED, a higher percentage of frequent visitors would have a history of HCV or HIV compared to these conditions in the general ED population. Consistent with previous literature, we also predicted that a higher percentage of frequent visitors would have a history of psychiatric complaints or a history of alcohol abuse compared to non-frequent visitors. Given that chronic liver disease is often associated with a history of alcohol abuse and concurrent depression, we further hypothesized that patients with HCV would be more frequent visitors than patients with psychiatric illness or alcohol abuse but without concurrent liver disease.

MATERIALS AND METHODS

In a retrospective review of electronic medical records, all visits from January 1, 2008 to December 31, 2008 to two EDs in a university medical center were examined. The electronic medical records for all visits were converted to a spreadsheet (Microsoft Excel 1997–2003; Microsoft Corporation, Redmond, WA) (each visit as one "case"), and this spreadsheet was utilized in further data analyses. The number of visits for each individual patient was generated by using a patient's medical record number as his or her unique identifier. Frequent ED visitors were identified as those individuals who made four or more visits to the ED during the year. Presenting complaints and past medical history had been recorded for each visit in the electronic medical record.

For each ED visit, a presenting chief complaint was chosen from a drop-down menu of 145 options by the triage nurse. Past medical history was recorded in text format as reported by the patient. Visits with a presenting chief complaint identified as a "Psychiatric Evaluation" and "ETOH" (ethyl alcohol) were flagged and categorized. The presenting complaint of "Psychiatric Evaluation" was defined very broadly and included patients who presented with mood, psychotic, or anxiety symptoms. The "ETOH" complaint included patients who presented to the ED with alcohol intoxication. HCV, HIV, and HBV are not options among the drop-down menu of chief complaints, thus, references to these conditions were identified in the medical history text field. Additional coding of the database was conducted to ensure that patients' medical histories were consistent across repeat visits. Specifically, all of the visits for each patient were inspected and coded to ensure that, if HCV or HIV appeared in the medical history of one visit, it also appeared in the history for other visits made by the same patient.

The study was approved by the university's Human Research Protections Program. Descriptive statistics and non-parametric tests (binomial and Pearson chi-squared) for group comparisons were conducted using SPSS/PASW 18 (IBM, Armonk, NY). To correct for multiple comparisons, significance values were set at $p < 0.01$.

RESULTS

A total of 60,475 *visits* were made to the ED in the study period by a total of 39,249 unique *patients*. Of the total visits, 3.0% documented HCV in the history, 2.8% documented HIV history, and 0.3% documented HBV history; 3.2% of all visits contained documentation of a history of alcohol abuse, and 3.8% contained documentation of a history of a psychiatric complaint.

Of the 39,249 total unique patients, 2.0% had a diagnosis of HCV in their history, 2.1% had a diagnosis of HIV, and 0.2% had a diagnosis of HBV; 1.9% had a history of alcohol abuse and 2.5% had a history of a psychiatric complaint.

For descriptive purposes, the average number of visits for the overall ED sample and the conditions of interest are presented in Table 1. Patients with both a psychiatric history and alcohol abuse history had, on average, the highest number of visits per year, followed by patients with HCV history and alcohol abuse.

Figure 1 illustrates the number of visits per patient for all patients who made more than one visit to the ED; 2221 patients had four or more visits and were marked as

Table 1. Number of ED Visits per Patient for a Calendar Year

Condition	Average Number of ED Visits	Standard Deviation	Range
Overall ED sample	1.5	1.5	1–48
HCV	2.3	2.4	1–24
HIV	2.0	2.3	1–29
HBV	2.1	1.9	1–11
Psychiatric complaint	2.3	2.6	1–29
Alcohol abuse	2.6	3.8	1–48
Psychiatric complaint and alcohol abuse	6.4	4.7	2–17
HCV and alcohol abuse	4.2	5.8	1–24

ED = Emergency Department; HCV = hepatitis C virus; HIV = human immunodeficiency virus; HBV = hepatitis B virus.

frequent visitors, thus, frequent visitors comprised 5.7% of all ED patients. These frequent visitors made a total of 16,967 visits, thus, 28% of all ED visits were made by frequent visitors. The 2221 frequent visitors were examined with respect to diagnosis of hepatitis, HIV, psychiatric complaint, and alcohol abuse.

Table 2 compares non-frequent visitors to frequent visitors with respect to age, gender, and the conditions of interest. Frequent visitors were older and slightly more likely to be male than non-frequent visitors. Chi-squared analyses indicated that all conditions were more prevalent in the frequent visitors vs. non-frequent visitors, most notably for psychiatric complaints and alcohol abuse. Binomial comparisons within each of the two visitor groups revealed that frequent visitors with a history of psychiatric complaints were significantly more prevalent than those with HCV, HIV, HBV, or alcohol abuse histories ($p < 0.001$). There were significantly higher proportions of patients with HCV history than HIV history in the frequent visitors, and significantly higher proportions of alcohol abuse history than HIV history ($p < 0.001$). Proportions of patients with HCV and alcohol abuse did not significantly differ from each other either among the frequent visitors or in those with less than four visits. HCV, alcohol abuse, and HIV patient proportions were all significantly higher than HBV ($p < 0.001$).

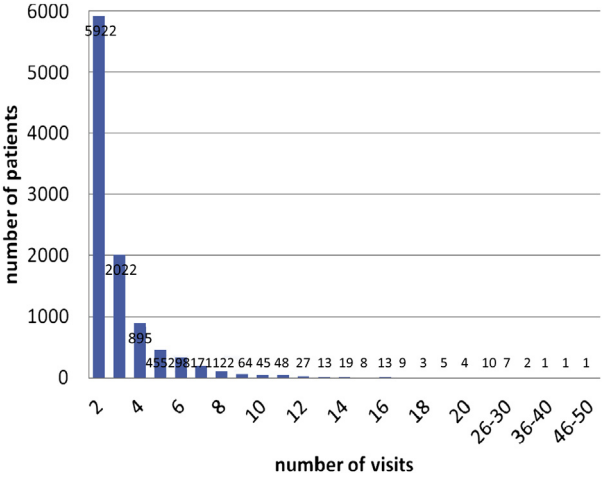

Figure 1. Number of visits per patient for patients who made more than one visit to the Emergency Department.

DISCUSSION

Frequent visitors make up a substantial proportion of patients and visits to a busy urban/suburban ED. As predicted, the rates of hepatitis C, HIV, psychiatric history, and alcohol abuse are relatively high in frequent visitors and significantly higher than in HBV, but base rates of HBV are very low even in the larger ED population. The substantially larger proportion of HCV and HIV patients in the frequent visitors group as compared to frequent visitors with HBV underscores the significant illness burden of HIV and HCV relative to HBV, even though the general prevalence of HBV in the United States is thought to be similar to that of HIV (21,22). Interestingly, although the HIV patients were more prevalent than HCV patients in the larger ED population, HCV patients were more prevalent frequent visitors than HIV patients. This finding may be a consequence of the decreased amount of community resources for patients with HCV, as well as increased rates of depression in these patients (20).

Psychiatric complaints were the most frequent of the conditions studied here; this was observed in the larger ED population and especially in the frequent visitors. Contrary to our hypothesis, patients with HCV were not more prevalent in the frequent visitors group compared to those with psychiatric conditions; in fact, patients with psychiatric conditions were significantly more prevalent than patients with HCV. This observation underscores the especially heavy burden of mental illness on EDs. Mental illness and substance abuse have been separately implicated in frequent ED use, but to our knowledge, this is the first study to report that patients with psychiatric complaints accompanied by alcohol abuse, so-called "dual diagnosis" patients, are especially frequent users of the ED, with an average of six visits per patient, compared to approximately two visits per patient with a psychiatric complaint or alcohol use alone. Taken together, these findings underscore the anecdotal reports of ED physicians that individuals who struggle with both mental illness and drug addiction often use the 911 and ED systems as their primary mode of health care and thus place a substantial burden on precious emergency resources (23). Furthermore, although a previous study has recommended that screening for depressive symptoms may capture patients at risk for high ED utilization, the current results imply that a limited focus on

Table 2. Demographics and Frequencies (Percentages) of ED Patients with Hepatitis, HIV, Psychiatric Complaint, and Alcohol Abuse in Non-frequent and Frequent Visitors

Variable	ED Patients with <4 Visits (n = 37,029)	Patients with At Least 4 Visits (n = 2221)	Group Difference Statistic	Difference Score (Confidence Interval)
Age, years	Mean = 42.4 (SD = 20.7)	Mean = 48.9 (SD = 17.0)	t (39,246) = 14.5, $p < 0.001$	6.5 years (5.6–7.4)
Gender	18,502 male (50.0%)	1151 male (51.8%)	$\chi^2 = 2.9$, $p = 0.05$	1.8% (−0.03–4.0)
HCV	664 (1.8%)	118 (5.3%)	$\chi^2 = 182.2$, $p < 0.001$	3.5% (2.6–4.5)
HIV	744 (2.0%)	90 (4.1%)	$\chi^2 = 45.5$, $p < 0.001$	2.1% (1.2–3.0)
HBV	82 (0.2%)	15 (0.7%)	$\chi^2 = 28.9$, $p < 0.001$	0.5% (0.2–0.9)
Psychiatric complaint	808 (2.2%)	165 (7.4%)	$\chi^2 = 238.6$, $p < 0.001$	5.2% (4.2–6.4)
Alcohol abuse	617 (1.7%)	128 (5.8%)	$\chi^2 = 188.9$, $p < 0.001$	4.1% (3.2–5.2)
Psychiatric complaint and alcohol abuse (dual diagnosis)	8 (0.02%)	13 (0.6%)	$\chi^2 = 124.5$, $p < 0.001$	0.6% (0.3–1.0)
HCV and alcohol abuse (HCV + ETOH)	17 (0.05%)	12 (0.5%)	$\chi^2 = 61.7$, $p < 0.001$	0.5% (0.3–0.9)

ED = Emergency Department; X^2 = Chi-Square; HIV = human immunodeficiency virus; HCV = hepatitis C virus; HBV = hepatitis B virus; ETOH = ethyl alcohol.

depression is likely to miss a larger spectrum of frequent ED utilizers (1). Rather, a brief screen for all major psychiatric symptoms (psychosis, anxiety, mania) as well as substance abuse history should be considered.

Patients with comorbid psychiatric illnesses and substance use can be challenging to effectively treat, and traditional interventions have shown limited success (24–26). Frequent ED use in this population may be reduced with the implementation of alternative psychiatric resources, such as psychiatric urgent care centers in urban communities, as well as availability of more community housing options for those with psychiatric illness. Full medical ED resources may not be necessary for these patients, but treatment plans tailored for the unique needs of substance-using psychiatric patients, for example, an approach that integrates mental health treatment with substance abuse interventions, could have significant efficacy. Individualized treatment plan and case management programs have shown some success at reducing frequent ED visits in chronically ill patients, though not consistently (27–29). Another strategy is for EDs to employ social workers and case managers who are specifically trained to screen for the spectrum of psychiatric symptoms and symptoms of substance abuse and who have knowledge of mental health and substance abuse treatment resources in the immediate community. These professionals may be able to identify ED patients who are at high risk for frequent use, which, as above, would not be limited to depressive symptoms, and help direct these patients to appropriate community health resources.

Limitations

This study has a number of important limitations, including its restriction to one calendar year. Use of a "patient-based" timeline, as described by Doupe and colleagues, allows for the use of the patient's own first visit as a reference point, and as the authors argue, may result in more accurate thresholds for frequent use (e.g., in their study, six or more additional visits within 365 days of the first visit) (9). Relatedly, although the definition of frequent visitors used here, four or more visits in 1 year, is commonly accepted, Pines et al. discuss characteristics of frequent use that few studies have captured; for example, whether frequent visits are clustered over a short period of time vs. spaced more evenly throughout the year, or how often frequent visitors are hospitalized (8). Such questions are critical to the understanding of frequent ED use and its burden on the health care system. A further limitation is the lack of direct comparison to other chronic medical conditions that may also result in frequent ED use, and whether comorbid psychiatric illness or substance abuse mediate the frequency of ED visits in these populations. Finally, given the retrospective nature of the study and its reliance on archival medical records, presenting complaints and medical history were not originally recorded in a standard fashion and were not subject to rigorous controls such as inter-rater reliability tests, leading to the possibility that illnesses, complaints, and conditions may have been underreported.

CONCLUSIONS

Chronic hepatitis and psychiatric complaints both result in an increased number of visits to the ED. Patients with psychiatric complaints, however, present to the ED more often than patients with either liver disease or HIV. Individuals with both a psychiatric condition and alcohol abuse are frequent users of the ED system and its valuable but limited resources. These patients should be a target population for directed case management services.

Acknowledgments—The authors thank Edward M. Castillo, PHD, MPH, and Clark Bach, BA, for their contributions to this work.

REFERENCES

1. Sandoval E, Smith S, Walter J, et al. A comparison of frequent and infrequent visitors to an urban emergency department. J Emerg Med 2010;38:115–21.
2. Byrne M, Murphy AW, Plunkett PK, McGee HM, Murray A, Bury G. Frequent attenders to an emergency department: a study of primary health care use, medical profile, and psychosocial characteristics. Ann Emerg Med 2003;41:309–18.
3. Hansagi H, Olsson M, Sjoberg S, Tomson Y, Goransson S. Frequent use of the hospital emergency department is indicative of high use of other health care services. Ann Emerg Med 2001;37:561–7.
4. Hunt KA, Weber EJ, Showstack JA, Colby DC, Callaham ML. Characteristics of frequent users of emergency departments. Ann Emerg Med 2006;48:1–8.
5. Kne T, Young R, Spillane L. Frequent ED users: patterns of use over time. Am J Emerg Med 1998;16:648–52.
6. LaCalle E, Rabin E. Frequent users of emergency departments: the myths, the data, and the policy implications. Ann Emerg Med 2010; 56:42–8.
7. Mandelberg JH, Kuhn RE, Kohn MA. Epidemiologic analysis of an urban, public emergency department's frequent users. Acad Emerg Med 2000;7:637–46.
8. Pines JM, Asplin BR, Kaji AH, et al. Frequent users of emergency department services: gaps in knowledge and a proposed research agenda. Acad Emerg Med 2011;18:e64–9.
9. Doupe MB, Palatnick W, Day S, et al. Frequent users of emergency departments: developing standard definitions and defining prominent risk factors. Ann Emerg Med 2012;60:24–32.
10. Chaput YJ, Lebel MJ. Demographic and clinical profiles of patients who make multiple visits to psychiatric emergency services. Psychiatr Serv 2007;58:335–41.
11. Dunford JV, Castillo EM, Chan TC, Vilke GM, Jenson P, Lindsay SP. Impact of the San Diego Serial Inebriate Program on use of emergency medical resources. Ann Emerg Med 2006;47:328–36.
12. Bernstein SL. Frequent emergency department visitors: the end of inappropriateness. Ann Emerg Med 2006;48:18–20.
13. Hanass-Hancock J, Nixon SA. The fields of HIV and disability: past, present and future. J Int AIDS Soc 2009;2:3.
14. Wong JB, McQuillan GM, McHutchison JG, Poynard T. Estimating future hepatitis C morbidity, mortality, and costs in the United States. Am J Public Health 2000;90:1562–9.
15. Khalsa JH, Vocci F. Clinical management of drug addicts infected with human immunodeficiency virus and hepatitis C virus. J Addict Dis 2008;27:1–10.
16. Basseri B, Yamini D, Chee G, Enayati PD, Tran T, Poordad F. Comorbidities associated with the increasing burden of hepatitis C infection. Liver Int 2010;30:1012–8.
17. Springer SA, Dushaj A, Azar MM. The impact of DSM-IV mental disorders on adherence to combination antiretroviral therapy among adult persons living with HIV/AIDS: a systematic review. AIDS Behav 2012;16:2119–43.
18. Foster GR. Hepatitis C virus infection: quality of life and side effects of treatment. J Hepatol 1999;31(Suppl 1):250–4.
19. Rowan PJ, Al-Jurdi R, Tavakoli-Tabasi S, Kunik ME, Satrom SL, El-Serag HB. Physical and psychosocial contributors to quality of life in veterans with hepatitis C not on antiviral therapy. J Clin Gastroenterol 2005;39:731–6.
20. Wilson MP, Castillo EM, Batey AM, Sapyta J, Aronson S. Hepatitis C and depressive symptoms: psychological and social factors matter more than liver injury. Int J Psychiatry Med 2010;40: 199–215.
21. Centers for Disease Control and Prevention (CDC). Hepatitis B information for health professionals. Atlanta, GA: Centers for Disease Control and Prevention; 2012.
22. Centers for Disease Control and Prevention (CDC). HIV in the United States: at a glance. Atlanta, GA: Centers for Disease Control and Prevention; 2012.
23. Gonzales J. "Frequent fliers" strain emergency medical system. San Diego: Union-Tribune; March 31, 2012.
24. Drake RE, Mueser KT. Psychosocial approaches to dual diagnosis. Schizophr Bull 2000;26:105–18.
25. Drake RE, O'Neal EL, Wallach MA. A systematic review of psychosocial research on psychosocial interventions for people with co-occurring severe mental and substance use disorders. J Subst Abuse Treat 2008;34:123–38.
26. Schulte SJ, Meier PS, Stirling J. Dual diagnosis clients' treatment satisfaction – a systematic review. BMC Psychiatry 2011; 11:64.
27. Sadowski LS, Kee RA, VanderWeele TJ, Buchanan D. Effect of a housing and case management program on emergency department visits and hospitalizations among chronically ill homeless adults: a randomized trial. JAMA 2009;301:1771–8.
28. Lee KH, Davenport L. Can case management interventions reduce the number of emergency department visits by frequent users? Health Care Manag (Frederick) 2006;25:155–9.
29. Spillane LL, Lumb EW, Cobaugh DJ, Wilcox SR, Clark JS, Schneider SM. Frequent users of the emergency department: can we intervene? Acad Emerg Med 1997;4:574–80.

ARTICLE SUMMARY

1. Why is this topic important?

Frequent users of the Emergency Department (ED) constitute a serious public health program due to the substantial drain on limited and expensive resources. A better understanding of the illness features of frequent users may inform alternative treatment strategies and provide some relief to over-taxed community emergency systems.

2. What does this study attempt to show?

This study examined whether individuals with chronic viral illness such as hepatitis C (HCV) and human immunodeficiency virus (HIV), as well as psychiatric complaints and alcohol abuse, are frequent users of a large urban/suburban ED.

3. What are the key findings?

HCV, HIV, and alcohol abuse were more prevalent in frequent users than non-frequent users, whereas individuals with a chronic viral illness with putatively less disability, hepatitis B, comprised a small proportion of ED users. Frequent visitors with psychiatric complaints were more prevalent than those with viral illness or alcohol abuse. The co-occurrence of alcohol abuse with either a psychiatric history or HCV was more prevalent in frequent versus non-frequent visitors.

4. How is patient care impacted?

The implementation of easily accessible community or "drop-in" treatment programs that target both mental illness and substance abuse may relieve EDs of frequent users whose conditions are not optimally treated in the ED setting. Additionally, use of case management and social work personnel in the ED who have specific training on screening for psychiatric and substance abuse and who are aware of community resources may aid in the early identification of individuals at high risk of becoming frequent users.