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Research Article

Differences in Thirty Day Healthcare Encounters Following Hospitalization in an Insured and Uninsured Population: A Retrospective Study

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Abstract

Objective: To describe the incidence of 30 day healthcare encounters following an index hospitalization in an uninsured and insured population.

Methods: This was a retrospective cohort study conducted at an urban, tertiary care hospital. Patients admitted between 7/1/2010 - 6/30/2011 that were between the ages of 18-64 were included if they had a financial code for no insurance or commercial insurance provider. The primary outcome assessed between groups was incidence of 30 day healthcare encounter following hospital disharge to either the emergency department or hospital.

Results: 5,489 patients were admitted over the study period 2,093 uninsured and 3,396 insured. The number of 30 day healthcare encounters for the uninsured and insured groups were 348 (16.6%) and 566 (16.7%), respectively (p = 0.99). The uninsured population was more likely to be have a 30 day healthcare encounter in the emergency department 237 (11.3%) vs 246 (7.2%), p <0.001. The uninsured group with a 30 day healthcare encounter were younger and more likely reside in a urban zip code. Conditions most frequently cited in 30 day healthcare encounter in the uninsured were abdominal pain, infections, diabetes, chronic pain and angina.

Conclusion: This analysis demonstrated no difference in incidence of 30 day healthcare encounters between an insured and uninsured population. However, the uninsured population was more likely to be seen in the emergency department at 30 days.

Keywords: Patient Readmission; Health Insurance; Medically Uninsured; Urban Hospitals

1. Introduction

Disease states frequently cited as a cause of 30 day hospital readmission in a Medicare population are heart failure, pneumonia, and chronic obstructive pulmonary disease (COPD) [1]. Poor follow up after hospital discharge, race of the patient and demographics a hospital serves have been linked to an increase rate of patient readmission [2,3]. Strategies to prevent readmission in the aforementioned medical conditions after discharge have been inconsistent in their effectiveness [4]. Strategies effective at preventing readmission are specific to the individual patient and involve early follow up, medication reconciliation and patient education of warning signs of the respective disease states that signifies worsening condition [5,6].

In 2011, it was noted that approximately, 49 million non-elderly patients in the United States are uninsured and comprise 22.0% of the total population aged 19-64 [7]. It is well described that this population has chronic conditions that do not receive adequate follow up care or proper preventive measures [8,9]. This has been subsequently linked to an increase morbidity and mortality for the same chronic conditions when compared to an insured population [10,11].

The readmission rate in the uninsured is poorly described in the medical literature with respect to frequency and reasoning for hospital readmission. Extrapolating interventions targeted at specific co-morbidities cited as a frequent cause of 30 day readmission in a Medicare population may not meet the needs of this population. The goal of this study is to identify the demographic characteristics, 30 day healthcare encounter rate and reason for 30 day healthcare encounter in the uninsured and insured populations at a large, urban, teaching institution.

2. Methods

This was a retrospective cohort study conducted at a tertiary care, urban, teaching institution in Detroit, MI. All patients hospitalized between the ages of 18 to 64 with an insurance billing code status of commercial insurance or uninsured between 7/1/10 to 6/30/11 were included. The commercially insured population will be referred to as the insured population for the remaining portion of the article. This study was approved by the institutional review board.

Patients admitted to hospital were identified by their insurance status as either uninsured or insured. Patients were identified using Corporate Data Stores, an electronic patient medical database that is utilized by the respective health organization. Baseline characteristics that were collected included age, sex, race and zip code. Zip code was stratified by urban or suburban zip code. The primary outcome was the incidence of 30 day healthcare encounter. This was collected by identifying all hospital admissions, emergency department visits and hospital discharge dates. Index hospitalization was defined as a hospital admission that was followed by a separate hospitalization or emergency department visit within 30 days of the initial hospitalization discharge date. An emergency department visit was defined as an acceptance of a patient to the emergency department that was then discharged directly from the emergency department to the community rather than being admitted to the hospital. A 30 day healthcare encounter was defined as either a hospitalization or emergency department visit that was preceded within 30 days of

an index hospitalization discharge date. Only the first 30 day healthcare encounter was included in this analysis per patient. The mean number of 30 day healthcare encounters per patient was calculated by dividing the total number of patients with one 30 day healthcare encounters by the total number of patients in each respective cohort. Secondary outcomes included mean number of healthcare visits (emergency department or hospital admissions), hospital admissions, and emergency department visits per patient. These outcomes were calculated for each cohort by taking the total number of healthcare visits, hospital admissions, and emergency department visits divided by the total number of patients identified in each cohort to calculate the mean value for each outcome per patient in the respective cohort group. A sub-group analysis of 100 randomly identified uninsured patients with a 30 day healthcare encounter were identified using a random list in Microsoft Excel (2007) to assess admission diagnosis for index and 30 day healthcare encounter to assess for the most frequent conditions involved in hospitalization. Cause of index hospitalization and 30 day healthcare encounter was determined by reviewing the hospital discharge summary and emergency department visit note for causality of healthcare visit.

Continuous variables were reported as mean ± SD. Categorical data was expressed as frequency and assessed utilizing chi squared test. Students-t test was used to analyze continuous variables. All tests were two-tailed, and a *p*-value <.05 was determined to represent statistical significance.

3. Results

During the one year study time period, 5,489 patients were admitted; 2,093 uninsured and 3,396 insured. Average age of the uninsured and insured populations was 42.6 ± 11.6 and 48.9 ± 12.2 years ($p < 0.001$), respectively. Male gender was more predominant in the uninsured population when compared to the insured (55.1 vs 41.3%, $p < 0.001$). The uninsured population were more likely to reside in an urban Zip-code when compared to the insured population (91.2 vs 39.9%, $p < 0.001$). Additional demographic characteristics can be seen in Table 1.

Overall, there was no difference in the incidence of 30 day healthcare encounter between the uninsured and insured groups (348 (16.6%) vs 566 (16.7%), $p = 0.99$) (Table 2). However, when the location of 30 day healthcare encounter was assessed as either emergency department of hospitalization, the uninsured population was more likely to be seen in the emergency department (237 (11.3%) vs 246 (7.2%), $p <0.001$). The uninsured population averaged more healthcare visits per patient when compared to the insured population (2.13 ± 2.1 vs 1.98 ± 1.9, $p = 0.01$).

Total visits were primarily driven by average number of emergency department visits per patient in the uninsured compared to the insured group (0.93 ± 1.9 vs 0.67 ± 1.4, $p < 0.001$). The uninsured population with a 30 day healthcare encounter were younger compared to the insured group (42.6 ± 11.6 vs 50.1 ± 12.2 years, $p < 0.001$). The uninsured population with a 30 day healthcare encounter were more likely to reside in an urban zip code when compared to the insured group (308 (88.5%) vs 264 (46.6%), $p = 0.013$).

	Uninsured (N=2093)	Insured (N=3396)	P-Value
Average Age, Yr ± SD	42.6 ± 11.6	48.9 ± 12.2	< 0.001
Median Age, Yr	44	52	
Sex, n (%)			
Male	1153 (55.1)	1404 (41.3)	< 0.001
Female	940 (44.9)	1992 (58.7)	< 0.001
Race, n (%)			
African American	1399 (66.8)	1600 (47.5)	< 0.001
Caucasian	374 (17.9)	1470 (43.7)	< 0.001
Other	320 (15.3)	327 (9.6)	< 0.001
Zip Code, n (%)			
Urban Zip Code	1909 (91.2)	1354 (39.9)	< 0.001
Suburban Zip Code	184 (8.8)	2042 (60.1)	< 0.001

Table 1: Baseline Demographic Characteristics

	Uninsured (N=2093)	Insured (N=3396)	P-Value
30 Day Healthcare Encounter, n (%)	348 (16.6)	566 (16.7)	0.99
Hospital	111 (5.3)	320 (9.4)	< 0.001
Emergency Room	237 (11.3)	246 (7.2)	< 0.001
Average Visits per Year, n ± SD			
Total Visits	2.13 ± 2.1	1.98 ±1.9	0.01
Hospital Visits	1.20 ± 0.6	1.32 ± 0.9	< 0.001
Emergency Room Visits	0.93 ± 1.9	0.67 ± 1.4	< 0.001
30 Day Visit Mean Age, Yr ± SD	42.6 ± 11.6	50.1 ± 12.2	< 0.001
30 Day Visit Median Age, Yr	45	52	-
Sex, n (%)			
Female	155 (44.5)	306 (54.1)	0.434
Male	193 (55.5)	260 (45.9)	0.241
Race, n (%)			
African American	233 (67.0)	299 (52.8)	0.146
Caucasian	71 (20.4)	227 (40.1)	0.097
Other	44 (12.6)	40 (7.1)	0.576
Zip Code, n (%)			

Urban Zip Code	308 (88.5)	264 (46.6)	0.013
Suburban Zip Code	40 (11.5)	302 (53.4)	0.012

Table 2: Thirty Day Healthcare Encounter

Index Hospitalization (n=100)		30 Day Encounter (n=100)		Same for Index and 30 Day (n=39)	
Condition	(n)	Condition	(n)	Condition	(n)
Abdominal Pain	24	Abdominal Pain	28	Abdominal Pain	14
Infection	18	Infection	13	Infection	6
Diabetes	5	Chronic Pain	9	Diabetes	3
Angina	5	Diabetes	5	Alcohol Related	3
Stroke	5	Angina	3	Others	1

Table 3: Most Common Causes of Healthcare Encounter By Visit Type

Two-hundred healthcare visits were analyzed from 100 randomly identified uninsured patients with a 30 day healthcare encounter (Table 3). The most frequent cause of index hospitalization were abdominal pain, infection related, diabetes, angina and stroke related admit (n = 24, 18, 5, 5, 5 respectively). The most frequent cause of 30 day healthcare encounter was abdominal pain, infection related, chronic pain, diabetes and angina (n = 28, 13, 9, 5, 3 respectively).

4. Discussion

Compared to the insured, the uninsured population were younger, more likely to be male and resided in an urban Zip code. When looking at the insured and uninsured population that had a 30 day healthcare encounter, the uninsured population was significantly younger and more likely to reside in an urban Zip code. There were no differences in the incidence of 30 day healthcare encounter between the insured and uninsured populations. The uninsured population were more likely to be seen in the emergency department for 30 day healthcare encounter. The rate of 30 day healthcare encounters in the both groups was similar to what has reported in previous literature with readmission rates ranging from 11.9 – 24.8% [1-6]. This was an interesting finding given the younger population that was analyzed in this study compared to previous literature with average age ranging from 75 – 81 years [1-6]. A possible explanation for this finding is the definition used for 30 day healthcare encounter included hospital readmissions and emergency department visits. This definition likely caused an increase in 30 day healthcare encounters for both groups, particularly the uninsured group which had 237 of its 348 (68.1%) 30 day healthcare encounters to the emergency department.

Patients in the uninsured group utilized emergency room resources more frequently than the insured group. This was an interesting finding and previous media reports suggest frequent use of emergency department by uninsured patients as a source of primary care [12,15]. Emergency department care has identified as being significantly more costly to manage conditions that could have been managed or prevented by seeing a primary care physician [13,14,16]. Findings in this study suggest high use of emergency department resources in the uninsured group this population would benefit from interventions previously described that focus on improving transitioning of care [5,6]. These interventions would need to be tailored to the demographic group and comorbidities seen in the present study to be successful [4].

Medical conditions that were most frequently involved healthcare visits were abdominal pain, infection related complications, diabetes, chronic pain and chest pain. This was different than what has previously been reported in literature in Medicare populations [1]. A possible explanation for these differences in 30 day healthcare encounter in this analysis is the population was younger and not typically affected by conditions such as heart failure and COPD. However, long term chronic conditions such as unstable angina and diabetes were a common source of a 30 day healthcare encounter.

Potential limitations of this study are the definition used to define 30 day healthcare encounter. For purposes of this study, emergency visits were combined with re-hospitalization for a 30 day visit after an index hospitalization. This may have falsely elevated the true 30 day healthcare encounter. Cause of index hospitalization, emergency department visits and rehospitalization were not identified by ICD-9 or diagnosis related group (DRG) codes like previous readmission literature. Cause of hospital visit was identified by independently reviewing each patients discharge summary for individual hospital visits. This may have more accurately described indication to hospitalization but is not likely to be reproduced due to the time that would be required in larger studies. Utilizing billing codes to identify the reason for hospital visit is subject to limitations as well. Lastly the results of this study may not be applicable to other medical centers because of differences in patient demographic characteristics.

This study presents information on a population in which not much is known in regards to demographics and conditions causing healthcare encounters. It is interesting to see that the overall rate of 30 day healthcare encounter is 16.6% (n=348) and was primarily driven by emergency department visits. These findings suggests that this population would benefit from improved transitioning of care to set patients up for early outpatient clinic visits; an intervention that has been shown to decreased rehospitalization in a Medicare population [2]. With the high volume of emergency department visits utilized per patient in the uninsured population compared to in the insured group, it is likely that this population would benefit from an increase access to primary care physicians to improve patient's care and prevent costly emergency department visits. Conditions that were seen in this population that were associated with 30 day healthcare encounter are different than what is seen in a Medicare population. Focusing on acute and chronic disease states such as; skin and soft tissue infections, urinary tract infections, pneumonia, diabetes, chest pain and proper management of pain, that may affect a younger uninsured population will likely help reduce

30 day healthcare encounters similar to what has been seen when utilizing systematic education prior to patient discharge for other disease states [5,6].

The uninsured population had a similar rate of 30 day healthcare encounters compared to the insured group and utilized emergency department more frequently. The population was younger and more likely to reside in an urban Zip code. Future studies should focus on developing a systematic process for caring for hospitalized uninsured patients, focusing on the disease states encountered in this population. These patients should be provided with early follow up care to a primary care doctor, systematic education about their disease state and what should be done if their condition worsens to prevent unnecessary emergency department and hospital visits.

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Conflicts of Interest

The authors report no financial support utilized for production of this manuscript and no conflicts of interest in the presentation of data.

References

1. Jencks SF, et al. Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med 360 (2009): 1418-1428.
2. Hernandez AF, et al. Relationship between early physician follow-up and 30-day readmission among Medicare beneficiaries hospitalized for heart failure. JAMA 303 (2010): 1716-1722.
3. Joynt EK, et al. Thirty-Day Readmission Rates for Medicare Beneficiaries by Race and Site of Care. JAMA 305 (2011): 675-681.
4. Shepperd S, McClaran J, Phillips CO, et al. Discharge planning from hospital to home. Cochrane Database Syst Rev 20 (2010).
5. Coleman EA, Parry C, Chalmers S, et al. The care transitions intervention: results of a randomized controlled trial. Arch Intern Med 166 (2006): 1822-1828.
6. Voss R, Gardner R, Baier R, et al. The care transitions intervention: translating from efficacy to effectiveness. Arch Intern Med 171 (2011): 1232-1237.
7. Kaiser Family Foundation. The uninsured a primer. Published: 10/13/2011. Accessed: 5/22/12 at http://www.kff.org/uninsured/7451.cfm
8. Hadley J. Insurance coverage, medical care use, and short-term health changes following an unintentional injury or the onset of a chronic condition. JAMA 297 (2007): 1073-1084.
9. Ayanian JZ, Weissman JS, Schneider EC, et al. Unmet Health Needs of Uninsured Adults in the United States. *JAMA* 284 (2000): 2061-2069.
10. Stan Dorn. Uninsured and dying because of it: updating the institute of medicine analysis on the impact of uninsurance on mortality. Jan 1, 2008. Accessed: 5/20/2012. http://www.urban.org/url.cfm?ID=411588

11. Davidoff AJ, Kenney G, et al. Uninsured Americans with Chronic Health Conditions: Key Findings from the National Health Interview Survey, Urban Institute, May 2005, available at http://www.urban.org/publications/411161.html
12. Loeb P. Study: more uninsured people using emergencies rooms for basic care. 2/20/12. Accessed: 6/24/12 at http://philadelphia.cbslocal.com/2012/02/20/a-study-by-the-delaware-valley-healthcare-council-shows-more-uninsured-people-using-emergency-rooms-for-basic-care/
13. Bamezai A, Melnick G, Nawathe A. The cost of an emergency department visit and its relationship to emergency department volume. Ann Emerg Med 45 (2005): 483-490.
14. Bamezai A, Melnick G. Marginal cost of emergency department outpatient visits: an update using California data. Med Care 44 (2006): 835-841.
15. Gindi RM, Cohen RA, Kirzinger WK. Emergency room use among adults aged 18–64: Early release of estimates from the National Health Interview Survey, January–June 2011. National Center for Health Statistics. May 2012. Available from: http://www.cdc.gov/nchs/nhis/releases.htm. Accessed 6/27/12.
16. Blue Cross and Blue Shield Association. Doctor's Office Versus E.R. Visits. 2009 Available at: http://www.bcbstx.com/employer/hccc/topic6.htm. Accessed 6/27/12.