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Major depression and recent physical or sexual abuse increase readmissions among high-utilising primary care patients

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ABSTRACT

Objective To investigate whether current major depression and past physical/sexual victimisation is associated with recurrent general hospital admissions.

Method Ninety-six inner-city primary care patients with a history of high medical service utilisation completed the PRIME-MD and the Abuse Assessment Screen; medical records were reviewed to assess reasons for re-hospitalisations. We compared hospitalisation rates over the preceding 12 months between those subjects with and without major depression and those with and without histories of abuse.

Results Compared to non-abused subjects, patients with past-year abuse showed significantly

increased past-year hospitalisations (3.2 versus 1.8, $P = 0.007$). Re-admissions were related to chronic disease management and were not because of acute physical effects of trauma. Analysis of variance revealed that major depressive disorder and past-year abuse history interacted to increase an association with re-admissions.

Conclusions Past-year abuse was independently associated with increased hospital admissions. Psychological effects of recent abuse combined with depression may particularly increase rates of medical/surgical hospitalisations.

Keywords: depression, healthcare costs, healthcare utilisation, physical abuse, sexual abuse

Introduction

A small proportion of patients account for the majority of healthcare utilisation, with 5–15% of patients responsible for 45–70% of costs.¹ These so-called ‘high-utilisers’ frequently suffer from co-morbid medical and psychiatric illnesses, but they are not well characterised in terms of risk factors, treatment or long-term outcomes.² Nor do we typically understand what drives their utilisation. Disease severity alone appears to be a poor predictor of future hospitalisation.³

Previous studies have found increased levels of depression among primary care patients with high levels of outpatient utilisation. Furthermore, depressed patients show increased levels of medical utilisation compared to non-depressed individuals with comparable levels of physical illness.^{2,4}

Recently, there has also been interest in the effects of physical or sexual violence on health status and healthcare utilisation. Victimization, whether as a child or as an adult, appears to have important health and mental health consequences.^{5–7} Among medical patients, the experience of interpersonal violence is associated with specific syndromes (irritable bowel syndrome, chronic pelvic pain, refractory headache) as well as with poly-symptomatic complaints.^{8,9} Histories of abuse, and the presence of post-traumatic stress disorder, like depression, appear to be associated with increased healthcare costs.¹⁰ The amount, type and timing of abuse may all affect healthcare costs.^{11–13}

The current report, carried out in the context of a randomised trial of case management to reduce hospitalisation rates among a group of patients with a history of high medical costs and hospitalisation rates,¹⁴ focuses on the possible association of current depression and past physical or sexual abuse with healthcare utilisation, specifically on hospital readmission rates.

Methods

The parent study results and methods can be viewed in detail in a previous publication; what follows is a brief summary.¹⁴

Study site

The site was an inner-city academic primary care centre that treats approximately 5000 individual patients making 15 000 visits per year, and is part of a 900-bed academic tertiary care medical centre.

Subject selection

We identified patients with at least two prior medical or surgical hospitalisations during the two years prior to the study. Eligible patients were aged 18 years or older, had no major cognitive impairment, were English speaking and non-institutionalised, and had made at least two prior visits to the primary care centre. Costs included inpatient, outpatient and ancillary costs. In order to address care of patients with chronic illness rather than those at the end of life, patients with extreme history of utilisation (>2 standard deviations from the group mean) or a terminal clinical condition (Charlson Co-morbidity Index >5) were not included.^{14,15} The study was approved by the relevant human investigations committee.

Research evaluations

Eligible patients were invited to complete a variety of psychosocial questionnaires that included PRIME-MD,¹⁶ a brief diagnostic mental health instrument for primary care, and physical/sexual violence questions adapted from the Abuse Assessment Screen.¹⁷

- 1 have you ever been physically, sexually or emotionally abused?
- 2 within the past year, have you been hit, kicked, slapped or forced to have sex?
- 3 was the perpetrator your partner?

Functioning and quality of life were assessed with the SF-36.¹⁸ Alcohol abuse was assessed via the AUDIT,¹⁹ and drug abuse via the Addiction Severity Index.²⁰

Health resource use measurement

Hospital resource use for one year prior to study entry for each subject was collected using the hospital administrative database. Utilisation was measured by calculated direct costs and by numbers of hospitalisations and hospital days. No medical resource utilisation that occurred outside the medical centre was collected.

Analyses

Statistical tests were performed using SAS. Significance level was set at 0.05. All utilisation and cost data that did not meet the requirements of normal distribution were analysed with both raw values and logarithmic transformations.

Results

Demographics and medical co-morbidities

Two-hundred and thirty-eight eligible patients were identified from hospital information systems and contacted for this study. One-hundred and forty-two subjects were excluded (66 refused to participate; 57 had Charlson Index score >5; 13 did not appear for the initial interview; and six had participated in a similar pilot programme), leaving 96 enrolled patients who had psychosocial assessments performed.¹⁴ Subjects were predominantly female (67%), non-elderly (mean age 51 years), from ethnic minorities (50% African-American, 13% Hispanic), and poor (64% with annual family income less than \$10 000).

Mental health characteristics

Psychiatric diagnoses were common, but reported substance abuse was not. At least one psychiatric diagnosis derived from the PRIME-MD was present in nearly half (48%). The most common diagnosis was major depressive disorder (MDD), present in one-third (32/96) of subjects. Depression of any type (including MDD, dysthymia, partial remission of MDD, or bipolar depression) was present in 39%. Anxiety disorders were slightly less common (26%). Alcohol and other substance abuse/use were not prominent, with non-diagnostic mean score on AUDIT (2.6 ± 4.6) and no current acknowledged use of cocaine or heroin.

Patients with MDD

Compared to patients without MDD, the 32 patients with MDD were younger (mean age 46 ± 14 versus 54 ± 17 years, $P = 0.02$) and poorer, with a larger proportion of family incomes reported below \$10 000 per year (81% versus 55%, $P = 0.03$). Patients with MDD had lower Charlson Index scores than those without MDD (1.3 ± 1.4 versus 2.0 ± 1.6 , $P = 0.03$), compatible with fewer co-morbid illnesses.

Patients with MDD showed evidence on SF-36 scales of more disability in areas of mental health, role and social functioning and bodily pain, but depressed patients did not differ from non-depressed patients in terms of physical functioning.

Physical/sexual abuse

Substantial rates of physical or sexual abuse were reported by our group of primary care patients: 42 of 96 patients (44%) reported having been 'abused by someone important' over their lifetime, and 16/96

(17%) indicated that they had been 'hit, kicked, slapped, or forced to have sex over the past year'. All but two of the past-year abused subjects reported that the victimisation was perpetrated by a domestic partner. Compared to subjects with no history of prior abuse, the 42 subjects who reported abuse sometime in the past were younger (42 ± 12 versus 58 ± 16 years, $P = 0.001$) and more likely to be women (79% versus 57%, $P = 0.03$).

Association of MDD and history of abuse with healthcare utilisation

Abuse and depression overlapped. Subjects with MDD were twice as likely to report having been abused at some point in their lives compared to those without MDD (66% versus 33%, $P = 0.002$) and were also far more likely to report physical or sexual violence over the preceding one year (34% versus 8%, $P = 0.001$). Likewise, subjects with any history of abuse were more likely to have MDD (62% versus 20%, $P = 0.001$). In contrast to the shared psychiatric co-morbidity, neither the depressed nor the abused patient groups showed evidence for increased medical co-morbidity (on Charlson) or for diminished physical functioning (on SF-36).

Despite this lack of evidence for worsened physical health among depressed or abused patients, there were important differences in healthcare utilisation. While there was a non-significant trend for patients with MDD to have been hospitalised more frequently in the 12 months prior to study entry (2.4 ± 2.6 versus 1.7 ± 1.5 times, $P = 0.10$), utilisation was notably increased among subjects reporting abuse over the past year ($n = 16$). These individuals had been hospitalised 3.2 ± 3.0 times, compared to 1.6 ± 1.6 times in the never-abused subjects ($P = 0.007$). However, the Charlson Index score among these patients was significantly *lower* than among never-abused subjects (meaning they had *fewer* illnesses: 1.1 versus 1.6, $P = 0.05$), and they had comparable SF-36 physical functioning scores (mean 19.7 versus 19.4). In order to examine the possibility that patients with recent abuse were hospitalised for injuries relating to abuse, charts were reviewed. In every case, patients had been re-admitted for exacerbation of chronic illness. In no case was a patient readmitted for physical trauma. Because of large variations, there were no demonstrable differences in total hospital days or costs for either depression or abuse.

Interaction of MDD and abuse history

In order to further explore the effects of current MDD and abuse histories on hospitalisation rates, we performed a two-way analysis of variance (ANOVA):

depression (major depression present or absent, two levels) and abuse history (three levels – none, remote only, recent) comprised the grouping variables for a 2×3 analysis (see Table 1). Together these two variables (MDD and abuse history) accounted for 15% of variance in hospitalisations among the 96 patients. Only the group with both current MDD and reported past-year abuse ($n = 11$), however, showed a statistically significant increase in number of hospitalisations (3.7 per year, $P = 0.003$) in relation to the other groups.

Discussion

The findings of this study suggest that depression and physical/sexual abuse histories are common among primary care patients with patterns of high utilisation of hospital resources. The rates of physical or sexual abuse found here were comparable to

those described in previous studies of urban women, although one-third of our sample – and one-fifth of those with abuse histories – was male.^{8,21,22} Recent abuse was particularly associated with increased hospital admissions during the year prior to the measure, and these admissions were unrelated to direct physical effects of abuse. In addition, depression interacted with past-year abuse to enhance the association with increased hospital admission frequency.

While this study presents the findings of 96 patients who had received careful psychosocial assessments, there are several weaknesses that will need to be addressed in future research. The number of patients was too small to thoroughly evaluate the economic consequences of the findings. The enormous variation of cost data among subjects required a larger number in order to properly evaluate the effect sizes of the association of abuse and depression on costs. Measures that afford more in-depth assessments of both depression and abuse would have been useful. Furthermore, our efforts to focus

Table 1 Analysis of variance: number of past year hospitalisations in relation to depression (2 levels) and abuse history (3 levels)

	MDD ^a (+), $n = 32$	MDD ^a (-), $n = 64$
Never abused, $n = 54$; number of hospitalisations (SD)	$n = 11$; 1.0 (1.2)	$n = 43$; 1.74 (1.7)
Remotely abused ^b , $n = 26$; number of hospitalisations (SD)	$n = 10$; 2.5 (2.1)	$n = 16$; 1.38 (1.0)
Past-year abused, $n = 16$; number of hospitalisations (SD)	$n = 11$; 3.73 (3.5)	$n = 5$; 2.0 (0.7)

SD: standard deviation

^aMDD = major depressive disorder as determined by PRIME-MD

^bRemotely abused = lifetime history of abuse not within the past year

ANOVA

Model 1	Sum of squares	Degrees of freedom	Mean square	F test	Probability level
Regression	54.077	5	10.815	3.186	0.011
Residual	305.548	90	3.395		
Total	359.625	95			

Model summary

Model 1	Regression coefficient (R)	R^2	Adjusted R^2	Standard error of the estimate
	0.388	0.150	0.103	1.843

the parent study on a specific population may have skewed the results of the apparent associations noted here.¹⁴ This population, drawn from an inner-city academic clinic, may not be representative of other, less-challenged populations, but patients such as those described are at particular risk for both depression and abuse.^{23,24}

This study raises further questions about the role of depression and abuse in patterns of high utilisation of hospital services. For instance, there is the suggestion that each may enhance the likelihood that a patient with a chronic illness of a particular level of severity will be more costly than a patient with a similar level of physical illness but without the depression or abuse. This idea will be pursued in further research.

Repetitive general hospital admissions have not been well explained. Patients with such utilisation patterns cannot be distinguished on the basis of illness severity alone.³ Untreated depression and abuse history may prove to be important clinical variables in primary care patients with patterns of repetitive hospitalisations. It remains to be investigated whether treatment of these conditions could prevent unnecessary utilisation. Given the skewed nature of healthcare utilisation and costs, with a relatively small number of chronically ill patients requiring repetitive hospitalisations and accounting for a significant portion of the nation's healthcare expenditures, attention to the possible interactive effects of depression and abuse on utilisation could have important economic, as well as clinical, effects.

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CONFLICTS OF INTEREST

None.

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