Factors Related to Hospital Readmission of Elderly Cardiac Patients

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Elderly patients with cardiac disease are at high risk for physical deterioration during posthospital recovery and suffer frequent early readmission. This study found that mental status and posthospital stress were significantly related to early readmission.

STUDIES HAVE shown that a high percentage of admissions of elderly patients to acute care hospitals are actually readmissions for the same or related problems. Depending on the type of hospital, the readmission rate can be at least a quarter of all admissions.[1] The patients most frequently readmitted are those with diseases that require the greatest changes in lifestyle, such as dietary changes, taking multiple medications, restrictions in mobility, and necessary changes in the home environment.[2] Such changes require compliance with medical recommendations and adaptations in lifestyle that have been found to be key factors in the success or failure of medical treatment and posthospital recovery.[3]

It is estimated that elderly patients account for 38 percent of all days in short-stay hospitals. Those elderly with cardiac problems account for 18 percent of all short-stay hospital days and 45 percent of all deaths.[4] Elderly patients with cardiac disease are at especially high risk for physical deterioration during posthospital recovery and have been identified as being at high risk for frequent readmission because of the severity of the illness, their age, and the impact of psychological and social stresses on the course of the disease.[5] These patients frequently incur major life changes due to chronic functional disability.

For the elderly person, a hospital admission for cardiac disease exacerbates his or her worst fears: loss of independent physical functioning, heightened dependence on family members, and concomitant loss of self-esteem.[6] Multiple readmissions intensify the complex interplay between medical, psychological, and social factors affecting the patient, family, and caregivers. Hospitalization, discharge, and readmission are not only emotionally difficult to handle but increase the risk of the patient becoming confused, disoriented, and less able to manage the posthospital adjustments necessitated by the disease or condition.[7]

In addition, readmissions are expensive. It has been found that when compared to a patient's first hospitalization, the readmission costs ranged from 24 to 55 percent higher.[8] Thus, in both humane and economic terms, the cost of premature readmission poses grave concerns.

It has been estimated that 50 percent of social work clients among inpatients in acute care hospitals are elderly and that 20 percent of these elders are patients with cardiac diseases.[9] These patients face greater severity of illness than younger hospitalized patients and are more likely to have incapacitating chronic illnesses. Most services given by social workers to elderly inpatients focus on issues that arise in the context of discharge planning.[10]

The prevention of premature or avoidable readmissions of elderly cardiac patients to the hospital should be a major concern of discharge planning. Therefore, early identification is essential of those who will experience psychological and social problems in following medical recommendations and in adjusting to necessary life changes in the critical posthospital recovery period. If such problems are unattended, these high-risk patients may regress physically, which can result in premature rehospitalization, long-term care institutionalization, or death. If these high-risk patients can be identified early, during the course of hospitalization, health professionals can target their efforts to work with them both in the hospital and following discharge, thus minimizing the chance of, and possibly avoiding, early recurrent readmissions.

Currently, discharge decisions relative to planning for posthospital care of elderly patients are made by social workers after interviews with the patient, family members, and other professionals. These decisions are based on professional knowledge and experience but are subjective, personalized interpretations of risk. To implement a truly preventive treatment approach, discharge screening is needed, but a reliable and valid screening approach to identify elderly cardiac patients at risk for premature readmission is not available.

At present, two methods for screening patients at high risk for discharge needs are frequently used by social workers: The Berkman-Rehr high social risk screening method and the CAAST Index.[11] In the Berkman-Rehr screening mechanism, "high risk" is defined by diagnosis and prognosis rather than by emotional or physical dysfunction that can adversely affect the course of recovery. Thus, rather than specifically targeting cardiac patients who are at high risk for noncompliance with posthospital medical treatment and necessary lifestyle changes, this instrument screens in *all* elderly cardiac patients, resulting in too many false positives (cases do not needing intervention).

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The CAAST Index is an attempt to predetermine levels of social disposition in order to expedite the process of discharge planning and limit the number of in-hospital days that are not medically necessary. The CAAST Index focuses on physical and psychological aspects of the individual (continence, ambulation, age, social background, and thought processes). The authors of this index have suggested that future study should be directed at identifying more predictive variables.

Neither the Berkman-Rehr method nor the CAAST Index specifically addresses either the psychological and social variables that may be causes of noncompliance with treatment or the lifestyle changes that can, in turn, result in early recurrent readmissions. These screening mechanisms therefore do not predict patients at high risk for premature readmission. What is now needed is a decision approach, with predetermined criteria, using a reliable and valid screening mechanism, which can lead to treatment plans that are based on a systematic, objective, and comprehensive approach to assessment rather than on subjective impressions.

The exploratory study reported in this article focused on elderly patients with myocardial infarctions. The specific aim was to identify social and psychological factors that might differentiate patients with early recurrent readmissions (that is, readmissions within six months of the previous discharge) from patients whose first admissions are not followed by a second admission in this short period of time. Analyses focused on the question of which among the studied factors varied significantly between those who do and those who do not have short-term readmission. This exploration was considered a necessary first step in the development of an effective screening mechanism.

METHOD

Sample

The project involved an in-depth study of 30 patients, aged 65 or older, experiencing their first myocardial infarction, who were admitted to the Coronary Care Unit of Massachusetts General Hospital during the period from October 1982 to May 1983. The patients were not randomly selected but were chosen concurrently from the total myocardial infarction admissions to Massachusetts General Hospital. To be included in the study, patients had to have been discharged alive from the hospital to their home, to that of a relative, or to that of a friend. They also had to be residents of the Boston metropolitan area. The sample was limited to 30 patients due to restrictions in time and resources for follow-up.

Design

A descriptive research design was used. The retrospective data were collected six months postdischarge utilizing two sources: hospital records and telephone interviews. Hospitalization data were obtained from computerized printouts derived from the hospital's utilization review records. These data included demographic, medical, discharge, and length-of-stay information and information about readmission to Massachusetts General Hospital. Information from the individual printouts was interpreted, categorized, and coded. Because the data were technical in nature, an experienced gerontologist (a physician) interpreted the data in order to enhance its reliability and validity. Reliability of the data was also assessed through random checking of the coding.

Telephone interviews were conducted six months after the patients' discharge to obtain in-depth data related to the patients' adjustment and functioning during the posthospital recovery period. These interviews were conducted by a clinical researcher who had more than 20 years experience in hospital social work and who specialized in physical disability in the elderly. The questionnaire was structured with fixed alternative responses. These responses were organized categorically according to standardized definitions of terms provided by the Milbank Project Research Study, an ongoing study of cardiac patients at Massachusetts General Hospital.[12] This standardization method helped to objectify the terminology used to describe patients' daily functioning, provided greater consistency in interpretation of responses, and allowed for ease in coding and analyzing data.[13] The disadvantages of this approach lie in the potentially limited nature of responses and the difficulty of constructing categories inclusive of all relevant data. However, the face and content validity of the research instrument were assessed by a group of ten social work practitioners, and the instrument was believed to be well representative of the data and categories needed to assess psychosocial functioning postdischarge.

The respondents were primarily patients (20 or 67 percent), with family members (10 or 33 percent) serving as secondary sources of information. The interview data included the following categories: demographics, posthospital medical information, quality-of-life assessments, social-environment information, and readmission history. Demographics included age, gender, marital status, education, and employment. Posthospital medical information included type of medical follow-up utilized by the patients and physical activity levels. Data on quality of life included mental status and history of posthospital stress. Social-environmental variables included social living arrangements and type of community support services used. Readmission information included number of readmissions (to any institution) and diagnosis.

Limitations that may affect the validity of the interviewing data are as follows: small sample size from one hospital, which limits the generalizability; data based on retrospective perceptions and memories of patients and family members; and the use of one interviewer, which prevents the assessment of interjudge reliability. In addition, the limited sample size restricted statistical analysis to the relationship of individual variables to readmission rather than a multivariate analyses. However, it is believed that this exploration is useful as a first step in the development of a more refined screening instrument.

FINDINGS

The 30 patients in the study included 16 men (53 percent) and 14 women (47 percent). Their ages ranged from 65 to 87 years with a mean age of 73.5 years and a median of 73. Sixteen of these patients (53 percent) were married, seven (23 percent) were widowed, five (17 percent) were single, and one (3 percent) was divorced. No information was available on the marital status of one patient.

Eleven patients (36 percent) had completed at least 12 years of education; six (20 percent) had some high school education; and 12 (40 percent) had not progressed beyond eighth grade. No information was available on the education of one patient. The occupations of these patients ranged from blue to white collar. Their current financial resources varied. Seven patients (22 percent) derived their current income from a combination of earnings, savings, and social security benefits; 14 patients (47 percent) lived on social security benefits only; and six (20 percent) lived on social security with an additional pension. Three patients (9 percent) had unidentified sources of income.

The length of hospitalization that these patients experienced ranged from seven to 27 days, with an average stay of 14.4 days. After discharge, 11 patients (36 percent) were followed medically in the hospital clinic; seven patients (23 percent) were followed in both the hospital clinic and a

satellite clinic; and five patients (17 percent) were followed by a combination of the hospital clinic and a personal physician. Four patients (13 percent) used only a personal physician for follow-up care. The medical follow-up of three patients (10 percent) was unknown.

Of the 30 patients studied, 11 (37 percent) were readmitted to a hospital (Massachusetts General or other) within six months. Eight (73 percent) of these patients were readmitted with a condition related to the primary diagnosis of myocardial infarction. No significant relationship was found between early readmission and any one of the following demographic variables: age, sex, marital status, financial status, or educational background.

Physical Condition

In exploring medical data in relationship to early recurrent readmission, it was found that the longer the hospitalization (an indicator of complexity of illness), the greater the chance of readmission: 67 percent of those who stayed 14 days or longer, compared to 18 percent of those whose stay was less than 14 days, were readmitted ($\chi^2=6.11$, $df=1$, $p < .05$).

Another aspect of the patients' physical condition explored as a key predictive variable was perceived changes in physical activity level from preadmission to postdischarge. Physical activity was delineated at six levels: maximum exertion, moderate exertion, mild exertion, sedentary, bed-to-chair patient, or bedridden. Information on changes in physical activity was available for 29 patients. At the time of the postdischarge interview, 13 patients (45 percent) reported experiencing a deterioration in their preadmission physical activity level, 15 patients (52 percent) had remained the same, and one (3 percent) patient had improved. Although not achieving statistical significance, differences of interest were noted. Of those patients who believed they had deteriorated in their physical activity level, seven (54 percent) were readmitted to the hospital. This compared to four (25 percent) readmissions of those patients who believed they had remained the same physically or had improved ($\chi^2=2.54$, $df=1$, $p \leq .05$).

Social and Psychological Factors Related

Several social and psychological factors were explored in relationship to readmission: changes in mental status, posthospital stress level, and availability of social and community supports. Mental status was assessed as improved, as worsened, or as staying the same. The mental capacity of four patients had worsened since their illness, and three (75 percent) of these patients were readmitted. Twenty-six patients' mental capacity was the same or improved. Of these patients, seven (27 percent) were readmitted ($\chi^2=3.61$, $df=1$, $p \leq .05$).

Stress in the posthospital period was another factor explored as related to readmission. Stress data were categorized as: depression, grieving related to a family member's death, increased fears about their own or their spouse's health, and fear about having to relocate. Eighteen respondents (60 percent) reported significant stress and nine of those patients (50 percent) were readmitted. Twelve patients did not experience significant stress. Of these, only two (17 percent) were readmitted ($\chi^2=3.45$, $df=1$, $p \leq .05$).

Twenty-eight of the 30 patients (93 percent) had some type of nonprofessional social support. Eighteen of the 28 patients received nonprofessional support services from individuals living in the same house. Six (33 percent) of these patients were readmitted. Eight of the 28 patients received neighborhood supports only, three of these (38 percent) were readmitted ($\chi^2=.042$, $df=1$, $p \leq$ N.S.). Details on support were not available for two of the 28 patients.

Another area explored, because of its potential relationship to readmission, was that of professional supports. Professional services explored included the following: visiting nurses, homemakers, home health aides, and social workers. Of the 30 patients, 16 (53 percent) received professional services whereas 14 (47 percent) did not. Seven (46 percent) of those receiving professional services were readmitted. Of the 14 patients who did not receive professional services, three (21 percent) were readmitted ($\chi^2=1.67$, $df=1$, $p \leq$ N.S.). Eleven of the 16 patients with professional support services received these services from the Visiting Nurse Association. A total of seven (65 percent) of these patients were readmitted. Of the remaining five patients receiving professional supports other than the Visiting Nurse Association, none was readmitted ($\chi^2=5.66$, $df=1$, $p \leq .01$).

IMPLICATIONS

This exploratory study focused on a group of 30 elderly patients hospitalized with myocardial infarction. This patient population was chosen because it represents a cohort whose admitting diagnoses carry the prospect of impending chronicity, resulting in high use of health care resources and traumatic impact on both patients' and families' coping abilities. As previously mentioned, these patients are particularly vulnerable to readmission due to the severity of the illness, the age of population, and the impact of psychosocial stressor on the course of the disease. Approximately one-third of the myocardial infarction patients were readmitted within six months of discharge. This is significantly greater than the reported data on readmissions of elderly patients with other chronic illnesses.[14] The question raised was whether, in addition to severity of illness, we can identify factors of a psychosocial nature that differentiate the readmitted patient from the nonreadmitted. A more comprehensive understanding of those factors that may impede or strengthen the recovery process could lead to improved discharge planning and reduced early recurrent readmission. Two psychological factors were identified as significantly related to early recurrent readmission: mental status and postdischarge stressful events.

The patients in this study who were most frequently readmitted reported a postdischarge decline in mental functioning. This finding is consistent with prior research in which mental status has been repeatedly linked with ability to recover from medical illness.[15]

This study also found that the occurrence of stressful life events in the posthospitalization period was significantly related to patients' early, recurrent readmissions. Prior research has found preonset stressful life events to be negatively correlated with the ability of heart attack victims to recover from an attack.[16] This study further supports the significance of stressful life events and recovery. Should myocardial infarction patients suffer a further loss or trauma once they have returned home, their chances of being readmitted to the hospital increase. Clearly, mental capabilities and coping with stress must affect the patient's ability and willingness to follow necessary, but frequently complex, posthospital treatment regimens.

Other studies of factors affecting posthospital recovery have identified social supports—family, friends, and community resources—to be positively related to a person's recovery and ability to remain in the community.[17] The importance of family involvement with the elderly is underscored by the fact that 60 percent of the elders in our sample lived with relatives who were responsible for their posthospital care. One third of those living with a family member after discharge and almost one half of those having professional sup-

port (in particular a high percentage of patients receiving services from the Visiting Nurse Association) were rehospitalized.

There are a number of ways to look at the connection between family support and recidivism. It could simply be an indication of the severity of the patient's illness. However, one might look at this finding in light of the stress brought to family members when they have a sick elderly relative living with them.[18] Family members feel a responsibility to provide care for their elderly relatives but are not always equipped to deal with the various physical and emotional stresses placed on them in this process. The early readmission of the elderly patient may result from the caregiver's inability to adapt or cope with these stresses. In other cases, it may be the family member's lack of knowledge about how to provide care that leads to the patient's physical breakdown. Families often do not understand the importance of certain aspects of the recovery period. They may mistakenly assume that they should encourage the patient to stay in bed when what the patient really needs is to keep as active as possible. Maintaining an appropriate level of activity is important in preventing constipation and insomnia, and this type of encouragement may be difficult for families to provide.

Another explanation for these data on social support and readmission might involve the patient's inability to adjust to a loss of independent functioning. If the patient is being forced to adopt a dependent role during the recovery process, he or she may experience depression, confusion, and loss of self-esteem. These factors might relate to a worsening of his or her physical condition and precipitate an early readmission.

The connection between professional support services and readmission may also be an indication of the severity of the illness (that is, that the illness was so severe and debilitating that professional support services were required). It could also be that the professional was more alert to danger signals, such as the patients' declining health status, and thus facilitated rehospitalization.

Planning for supports is clearly an important part of effective discharge planning. This is a frail aged population. They, and family members involved with them, need support in finding ways of adapting to the specific illness and to the long-term implications of increased disability. The first few weeks at home following an initial hospitalization appear to be of critical importance. Factors having to do with professional supports need to be isolated and examined in greater detail in controlled studies.

FUTURE RESEARCH

It is clear from these exploratory findings that there is an interplay of social, psychological, and physiological factors that relate to patients' early recurrent readmissions. Limitations of this study did not permit detailed inquiry into the quantity or quality of communication between patient, family, and other caregivers that takes place in the crucial postdischarge period. Were medication regimens understood? Were they followed? Were patient and/or family unduly anxious or uninformed and therefore unable to anticipate markers of a normal or abnormal postdischarge course? Were they comfortable enough in their relationship with professional caregivers to call for advice or reassurance? Did they know whom to call? Were the expectations of patient or caregiver less or more than reasonable? Further studies focusing specifically on family and social supports, role changes, and compliance issues are critical.

The frail elderly are the population most at risk for recurrent hospitalization. As hosptials attempt to reduce length of stay to meet the mandate of tighter reimbursement formulas, they will need to focus attention on the specific posthospital needs of this type of chronically ill population. Preventing early recurrent admissions that result from posthospital social and psychological impediments to recovery can reduce the negative impact of premature readmissions on the elderly patient and his or her family. In addition, it is estimated that if one could effect a 20 percent decrease in the readmission rate, approximately 11 billion health care dollars per year could be saved.[19]

Health professionals are looking for ways to validly identify patients in need of posthospital services. Such services, provided immediately after discharge, might enable the elderly person to remain in his or her own home and prevent a premature rehospitalization, which is often a prelude to long-term institutionalization. As the population of elderly citizens continues to grow, we can expect more need for services by more patients who are at high risk for posthospitalization complications and who suffer early recurrent readmission. Posthospital services targeted at high-risk individuals may have a strong impact on improving social health care delivery. Identification of high-risk factors is a necessary first step toward the development of a screening mechanism to identify high-risk patients.

Although hospital social work departments have traditionally been considered the service equipped to assess patient's posthospital needs, all social workers must be better prepared to do so now in the service of the frail elderly. Cardiac patients may first come to the attention of social workers during an acute hospitalization. However, many times these patients are discharged, frequently without follow-up services, back to the community. Nonhospital-based social workers, regardless of setting, will encounter many frail elderly with cardiac diseases such as myocardial infarctions. They must be alert to those problems that could influence rehospitalization.

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