

ARTICLE

# GERIATRIC CONSULTATION OF FRAIL PATIENTS IN INTERNAL MEDICINE SERVICE AND ITS ASSOCIATION WITH HOSPITAL MORTALITY, HOSPITAL STAY AND INTENSIVE CARE UNIT ADMISSION. AN OBSERVATIONAL STUDY.

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## ABSTRACT

**Objective:** The main objective is to describe the association between monodisciplinary management led by the attending physician without geriatric intervention and the involvement of geriatrics as consultants for frail patients over 65 years old admitted to the internal medicine service. This assessment is based on patient outcomes, inpatient length of stay, percentage of admissions to intensive care unit, and in-hospital mortality.

**Methods and Analysis:** A prospective observational study was conducted in which all fragile patients over 65 years old admitted to internal medicine ward from March to November 2022 in two hospitals in northern Mexico were included. The outcomes were compared between the group of patients who received routine monodisciplinary management by their attending physician during hospitalization without the participation of a geriatrician, and those who had collaborative management with geriatrics as consultant. No interventions or suggestions were made to any of the groups assessed. Frailty stratification was performed on patients with the FRAIL scale.

**Results:** A total of 111 patients were included with a mean age of  $80.6 \pm 7.9$  years. Out of the total patients, 60 (54.1%) received management from their treating physician along with a geriatrician as a consultant, and the remaining 51 only received monodisciplinary management from their treating physician. There was an association between monodisciplinary management and longer in-hospital stay, compared to the patients who received medical management along with Geriatrics (13.4 vs 5.8 days,  $P < 0.0001$ ). 29% had a prolonged in-hospital stay, defined as longer than 9 days, and 84.8% of them had monodisciplinary management without Geriatrics consultation (84.8% vs 15.2%,  $P < 0.005$ ). Of the patients under study, 17.1% died during hospitalization. The mortality in patients consulted by geriatrics was lower, however this association was not statistically significant (47.4% vs 52.6%,  $P = 0.521$ ).

**Conclusion:** The support of the geriatric physician in the in-hospital medical management of the frail elderly patient is significantly associated with a reduction in the length of in-hospital stay and rate of critical care unit admissions. It was not significantly associated with lower mortality; however this could be explained by the inherent nature of frailty as an unfavorable prognostic factor.

KEY WORDS: frailty, geriatrics, elderly, hospitalization.

## INTRODUCTION

Since 1950, one of the most important global sociodemographic changes is aging (1), (2). Life expectancy has increased, and with this, older adults' population with all the social, economic and health implications. Nowadays, thirty percent of hospital admissions for any cause belong to people 65 years and older. This takes relevancy since older patients have more prevalence of frailty, comorbidity, polypharmacy, and other geriatrics syndromes that worsen functional and mortality prognosis, have longer hospital length stays and increased admissions to the intensive care unit (3). According to Steinmeier and collaborators, intrahospital mortality can reach 17.1%, meanwhile this percentage increases to 33.7% in the intensive care unit (4). Here is where Geriatrics gains value not only for the elderly patient, but for their families, caregivers, and different medical specialists. (5) Transversal geriatrics is described as geriatric medical care to vulnerable and frail older people in the acute care hospital setting. According to this new hospital care system, the geriatric physician provides individualized recommendations based on a comprehensive geriatric assessment to the medical team that impact prognosis and quality of life (6) (7). While ward-based comprehensive geriatric assessment has been established as effective in improving functional status and diminished average hospital length of stay and in-hospital mortality, there is few, heterogeneous and low quality evidence so further research is needed to establish the effectiveness of the model (8) (9).

## METHODS

The aim of this study was to describe the association of multidisciplinary management including a geriatric physician, and the duration of in-hospital stay, rate of intensive care unit admissions and in-hospital mortality in frailty-stratified patients older than 65 years of age, admitted to internal medicine hospitalization area in two hospitals in northern Mexico. These associations were compared with patients who received routine monodisciplinary management during their hospitalization by their attending physician, without the involvement of a geriatric physician. All frail patients over 65 years of age who consented to participate in the observational study and were admitted to the internal medicine ward in the months of March to November 2022 were included. No interventions or management suggestions were made to any of the assessed groups. Frailty stratification of patients was performed using the FRAIL scale (10).

A descriptive analysis of the categorical variables was conducted using frequencies and percentages, and for the continuous variables mean and standard deviation or median were used, following an assessment of variable

distribution by Kolmogorov-Smirnov test. For the comparison of categorical variables, tetrachoric tables were made, and the Chi-square test and Fisher's exact test were used. For the comparison of continuous variables, the Mann-Whitney test was used. A P-value < 0.05 and a 95% confidence interval were considered statistically significant.

## RESULTS

### Patient characteristics

A total of 111 patients were included with a mean age of  $80.6 \pm 7.9$  years, of whom 62 (55.9%) were women and 49 (44.1%) men. The average in-hospital period was  $9 \pm 9.6$ , and the mean number of comorbidities that the patients had was 4.

Out of the total number of patients, 60 (54.1%) received management from their attending physician along with a geriatrician, while the remaining 51 received only monodisciplinary management from their attending physician. The main admission diagnoses were pneumonia (18.9%), urinary tract infection (17.1%) and COVID-19 infection (10.8%).

The most frequent comorbidities were arterial hypertension (59.5%), cardiovascular disease (52.3%), diabetes mellitus (30.6%), endocrine disease (29.7%) and chronic kidney disease (20.7%). Polypharmacy was prevalent in 77.5% of admitted patients. Cognitive impairment was recorded in 18% of patients, the most common geriatric syndrome in patients consulted with Geriatrics (80% vs 20%,  $P = 0.013$ ). The rest of the comorbidities did not represent a significant statistical difference. A higher rate of admission to the intensive care unit was observed in those patients with monodisciplinary management compared to those who received management with Geriatrics (62.5% vs. 37.5%,  $P = 0.009$ ).

There was an association between monodisciplinary management and a longer in-hospital stay, compared to patients who had collaborative management with Geriatrics (13.4 vs 5.8 days,  $P = < 0.0001$ ). Twenty-nine percent of the participants had a prolonged in-hospital stay, defined as exceeding 9 days, and of these, 84.8% had monodisciplinary management without referral to the Geriatrics service (84.8% vs. 15.2%,  $P = < 0.005$ ). Of the patients under study, 17.1% died during hospitalization. Mortality in patients consulted to Geriatrics was lower; however, this association was not statistically significant (47.4% vs 52.6%,  $P = 0.521$ ).

## DISCUSSION

The effects of in-hospital geriatric intervention in terms of cost-effectiveness, mortality, patient functionality and admissions to critical care units are described heteroge-

neously in various studies conducted in countries where geriatric practice is standardized and accepted. Few studies have been conducted in developing countries, including Latin America. In-hospital geriatric intervention is based on comprehensive geriatric assessment with implementation of individualized therapeutic goals, management of geriatric syndromes, coordination of interdisciplinary teams, early discharge planning and reduction of functional deterioration during hospitalization.

Zelada and collaborators carried out a 9-month prospective controlled study in patients over 65 years of age with acute medical conditions. Of the total, 68 patients were admitted to a geriatric care unit and 75 to the standard care unit. In the geriatric unit the incidence of functional impairment was 19.1%, while in the standard unit it was 40%, as well as a shorter hospital stay in the geriatric unit (11).

Saltvedt and collaborators reported in their study that the treatment of elderly, frail and seriously ill individuals in a geriatric evaluation and management unit substantially reduced mortality. Mortality in the groups who were treated in a management unit and geriatric evaluation was respectively 12% compared to a mortality rate of 27% in patients with usual general ward management (12).

In our study, favorable associations were found in the reduction of in-hospital days of stay and the reduction of admissions to critical care units of hospitalized frail elderly patients when multidisciplinary management includes a geriatrician, compared to usual management. There were no significant differences in the incidence of mortality between the two types of management, although this could be explained by the high in-hospital mortality rate in frail patients.

The limitations of this study lie in its observational nature; however, it serves as an initial exploratory study that can encourage the development of multidisciplinary care protocols assessing the effects of interventions discussed in this work, as well as in the evaluation of functionality of the elderly patient after hospital discharge and quality of life. Additionally, this study encourages the promotion of intrahospital geriatrics in the management of frail older patients with acute illness, especially in countries where this model of care is unknown or not standardized, such as low- and middle-income countries, including Latin America.

## Declarations

### DISCLOSURE STATEMENTS

#### Ethics Approval

This study protocol was checked and approved by the Ethics Committee in Investigation of the Monterrey Institute of Technology and Higher Education. Participants signed an informed consent to participate.

#### Consent for publication

Authors grant BMC Geriatrics journal consent for publication.

#### Availability of data

All data generated or analyzed during this study are included in this published article as a supplementary information file.

#### Competing Interests

The authors have no competing interests as defined by BMC, or other interests that might be perceived to influence the results and/or discussion reported in this paper.

#### Author Contributions

M.C, O.T and L.R wrote the main manuscript text. R.C and M.C review the article. L.R translate it.

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## Additional Declarations

No competing interests reported.