学 位 論 文 の 要 旨

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学　位　論　文　名　The Effect of Management of Older Patients With Heart Failure by General Physicians on Mortality and Hospitalization Rates: a Retrospective Cohort Study

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論 文 内 容 の 要 旨

INTRODUCTION

The incidence of heart failure is increasing as the global population ages. Patients with heart failure commonly have many comorbidities. Thus, not only internists, such as cardiologists, but also general physicians need to manage such patients during primary care.

General physicians are adept at the management of older patients with multiple comorbidities and who need comprehensive care. Previous studies have reported that patients treated by general physicians are older and have more comorbidities than those treated by cardiologists, which may also apply to patients with heart failure. Thus, the management of heart failure by general physicians may reduce mortality and rehospitalization. The results of each previous study regarding rehospitalization and mortality rates for patients with heart failure managed by general physicians and cardiologists are different. To the best of our knowledge, whether the outcomes of general physicians' management of heart failure differs from those of internal physicians, including cardiologists, in Japan is unclear.

The purpose of this study was to determine whether the outcomes of management of heart failure by general physicians differs from that by internal medicine physicians, including cardiologists. This study highlighted the role and value of general physicians during the heart failure pandemic.

MATERIALS AND METHODS

A retrospective cohort study was conducted to investigate the hospitalization and mortality rates of patients with heart failure attending a community hospital. We obtained patient information from their medical records.

This study was conducted on patients attending Unnan City Hospital, a regional hospital in Shimane Prefecture, Japan. This hospital has 281 beds and 15 departments. General physicians are constantly present in the hospital, and each physician handles outpatients on weekdays.

Cardiologists are non-regular doctors who are dispatched from a university hospital in the same prefecture to treat outpatients. In this study, 9 years of data were collected (September 2015 to August 2023).

We used International Classification of Diseases (ICD) codes to extract the data of patients with heart failure from their medical records. We selected outpatients assigned these codes in the general medicine and internal medicine departments, including the cardiology department. Hospitalized patients were excluded from the study.

In this study, the primary outcome was death, and the time from diagnosis to death was measured. The secondary outcome was hospitalization. The independent variable was the department (general medicine or other internal medicine). The covariates were age, sex (male or female), body mass index, use of healthcare insurance, and the presence of chronic kidney failure, diabetes, chronic obstructive pulmonary disease, asthma, stroke, malignancy, or dementia.

For categorical variables, Fisher's exact test was used to compare general physicians and internal medicine physicians. For continuous variables, parametric data were analyzed using Welch'' t-test, and nonparametric data were analyzed using the Mann–Whitney U-test to compare the two groups. Multiple logistic regression analysis was used to determine the variables associated with hospitalization and death. Statistical significance was defined as a p-value < 0.05. All statistical analyses were performed using Easy R software.

This study ensured the anonymity and confidentiality of participants' information. All participants were informed about the research purpose, and informed consent was obtained either during hospital admission or the initial outpatient visit. Consent included the publication of study results. The research complied with the Declaration of Helsinki and its amendments, and the protocol was approved by the Unnan City Hospital Clinical Ethics Committee (approval ID: 20230035).

RESULTS AND DISCUSSION

Electronic medical records of 1032 patients with heart failure were evaluated. The mean age of all patients was 82.4 years. A total of 447 patients were treated by general physicians and 585 by internal medicine physicians; in 336 cases (57.4%), the internal medicine physicians were cardiologists. The proportion of admitted patients was slightly higher in the general medicine group, but the difference was not statistically significant. The proportion of patients who died was slightly lower in the general medicine group, but that difference was also not statistically significant. The time from diagnosis to death was longer in the internal medicine group ($p < 0.001$). Patients treated by general physicians were older ($p < 0.001$); and patients treated by general physicians were more likely to be covered by healthcare insurance ($p < 0.001$) and to have dementia ($p < 0.001$).

Multiple logistic regression analysis showed that being managed by a general physician (odds ratio [OR], 0.62) was negatively associated with death. Age (OR, 1.04), chronic kidney disease (OR, 2.50), and hospitalization (OR, 1.71) were significantly positively associated with mortality. Treatment by general physicians (OR, 0.73) was significantly negatively associated

with hospitalization. Age (OR, 1.04), use of healthcare insurance (OR, 1.85), asthma (OR, 2.82), and dementia (OR, 1.67) were significantly positively associated with hospitalization.

Comprehensive and continuous care by general physicians in managing heart failure may reduce hospitalization and mortality rates in community hospitals, as in previous studies. Furthermore, general physicians value continuity of care and believe in comprehensive patient-centered care that accounts for patients' backgrounds and aims to improve their quality of life, with a good relationship established over time, which may explain the results of the present study.

For effective collaboration between general physicians and specialists, they must share the role of continuity of care for multimorbidity in community hospitals. Further studies are needed to demonstrate the differences in the backgrounds and management of patients with heart failure to determine the optimal mode of collaboration in the management of patients with heart failure in a community hospital.

This study is valuable in demonstrating the importance of general medicine in the management of patients with heart failure with multimorbidity in the broader context of specialization in Japan. Previous studies have also shown that increasing the number of appropriately educated general physicians may reduce medical expenses related to the increasing rate of heart failure. With the aging of society and increasing specialization of physicians in different organ systems, general departments may become more critical in the future.

This study had several limitations. First, it was performed at a rural community hospital. Thus, its external validity may not extend to university hospitals and other settings. However, as the Japanese population is aging nationally, these results may become more applicable to many settings in the future. Second, we only used data from medical records, and detailed information was unavailable. Further research is needed to obtain detailed information on individual patients to determine the factors that lead to lower mortality and hospitalization rates among patients with heart failure managed by general physicians. Third, the difference in the average age of patients treated by internists and general physicians might have influenced the results of this study. Patients with heart failure treated by internists were younger than those treated by general physicians, which may explain the longer time between diagnosis and death of the former. Lastly, this was a retrospective cohort study; thus, causal relationships still need to be clarified.

CONCLUSION

This study suggests that the management of heart failure in older patients with multimorbidity by a general physician may reduce hospitalization and mortality rates. In Japan, where specialization is progressing, general physicians can provide comprehensive care to patients with heart failure who are older, require nursing care, and have comorbidities such as dementia, thereby potentially reducing hospitalizations and mortality. We believe that appropriate education of general physicians and an increase in their numbers are essential for the successful management of heart failure among the oldest individuals of the aging society.