

International Academic Research Competition 3 - Ajoy Khetan.pdf

by Sanaul Haque

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International Academic Research Competition(IARCO)

Research Title

Prevalence of sarcopenia and its association with clinical outcomes in heart failure among old aged people with preserved and reduced Ejection fraction

Scholar Name

AJOY KHETAN

Scholar's Affiliation

SIR SALIMULLAH MEDICAL COLLEGE,DHAKA

Scholar's Category

SENIOR

Country

BANGLADESH

Scholar's Email Address

khetanajoy@gmail.com

Submission Date

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Abstract: Heart failure (HF) is a common disease and represents the end stages of several types of heart disease. The modifiable changes in the locomotor system following the occurrence of HF play an important role in the development of many symptoms related to HF syndrome. Adopting a cross sectional observational study, that will assess the Prevalence of sarcopenia and its association with clinical outcomes in heart failure. Data will be collected using a SARC-F questionnaire and the data management analysis strategy called for using Stata version 17 analysis. Results are expected to provide a comprehensive evaluation of the prevalence of sarcopenia and its association with clinical outcomes in heart failure among old aged people with preserved and reduced Ejection fraction.

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Introduction:

Heart failure (HF) is a group of syndromes that may persist for a long time and which is characterized by Increased heart rate and fatigue. Sarcopenia is the age related involuntary loss of muscle mass and its commonness and advancement are significantly linked with coinciding precipitating factors[1]. Changes in muscle activity and it's structure are considered decisive factor in the progression of HF. In fact, a reciprocation may subsist between the pathogenic cascades involved in HF, age-related changes in body structure, and sarcopenia[2]. To be noted, in the older population, HF with preserved ejection fraction (HFpEF) is ubiquitous and the myocardial energy substrate and responses to interventions of patients with HFpEF differ from those of patients with HF with reduced ejection fraction (HFrEF). Although the effect of sarcopenia on prognosis may differ between HFrEF and HFpEF, no study has brought about a comprehensive evaluation of skeletal muscle in older patients with reduced preserved left ventricular ejection fraction (LVEF). So, in the particular study, I will observe if sarcopenia differently contributes to clinical outcomes in older patients with HFpEF and in those with HFrEF[4]

Literature Review:

In HFrEF, Sarcopenia is characterized by a hypercatabolic state that is associated with neurohormonal activation, chronic systemic inflammation, and reduced cardiac output leading to cachexia. On the contrary, in HFpEF, Older patients experience comorbidities like obesity and diabetes mellitus that develop through aging process and physical inactivity.

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The occurrence of sarcopenia is high in HF patients, and patients with HF, particularly those with reduced ejection fraction, are at high risk of unfavorable consequences from sarcopenia[1]. Population settings have a great impact on the prevalence of sarcopenia in patients with HF. Prevalence of sarcopenia in hospitalized patients is significantly higher than that of outpatients. The result can be elaborated by two main points: first, HF cases from the ambulatory population are more often in an early stage of the disease or even asymptomatic, and second, according to the mean age, those hospitalized participants were older than the mean age range of the outpatient-based studies[2] patients with HFrEF are more likely to have low skeletal muscle mass, but higher muscle strength and physical performance than patients with HFpEF, resulting in a similar

prevalence of sarcopenia between the two groups and sarcopenia similarly contributes to increased mortality in patients with HFpEF and in those with HFrEF[4]. Sarcopenia with obesity further increases the risk of diastolic dysfunction because HFpEF patients have exercise intolerance. The decrease of LVEF might result in low blood flow change of skeletal muscle and low-grade inflammation of HFrEF, increasing sarcopenia prevalence[5].

Hypothesis:

Sarcopenia has a high prevalence in patients with heart failure and is closely related to adverse clinical outcomes.

Research Question and Study Objective:

Zero Research Question: Is there any association between Heart Failure and Sarcopenia?

Final Research Question: How does Sarcopenia affects the outcome of Heart Failure with HFpEF and HFrEF among old aged people?

Salient Traits:

Clarity: Clearly defines Heart Failure and Sarcopenia as variables

Specificity: Focuses on old aged people

Relevance: Understanding the mechanisms and developing targeted interventions may improve patient outcomes and reduce the burden on health care system.

Feasibility: Data collection from old aged people and convenient forum.

Interest: Notifying an enthralling issue for educators and the society.

Study Objective:

To estimate the prevalence of sarcopenia among old patients with heart failure and compare commonness between:

HFrEF(LVEF<=40%) and

HFpEF(LVEF=>50%)

Proposed Methodology

20 Study Design: This study adopts a cross sectional observational study that will assess the Prevalence of sarcopenia and its association with clinical outcomes in heart failure among old aged people with preserved and reduced Ejection fraction.

Participants: 200 old aged(>65 years) people, with varying occupations and educational backgrounds.

④

Inclusion Criteria: (i) all studies will be cross-sectional design; (ii) research subjects: ≥65 years old, patients with HF diagnosed according to the clinical gold standard; (iii) assessment of sarcopenia will be implemented according to the sarcopenia consensus criteria (comprehensive: muscle mass and muscle strength or physical performance are combined; non-comprehensive: the aforementioned three aspects are only partially combined or applied separately); (iv) measurement of lean mass or muscle mass will be assessed by at least one of four main methods: bioelectrical impedance analysis, dual-energy X-ray absorptiometry, magnetic resonance imaging, or computed tomography; and (v) the prevalence of sarcopenia (primary outcome) in patients with HF will be reported.

Exclusion Criteria:

- (i)Acute HF
- (ii)Limb Amputation
- (iii)Contraindications to DXA/CT if used.

Study Area: The study will be conducted in the cardiology outpatient units of Tertiary level hospitals of Dhaka, Bangladesh.

Data Collection Method: Data will be collected using a SARC-F questionnaire, that will be utilized to ensure accuracy and consistency. Standardized and approved instruments will be utilized in this instance.

Data Analysis and management plan: The data management analysis strategy called for using Stata version 17 analysis (descriptive analysis). Data will be expressed as mean ± standard deviation (SD) for normally distributed variables and chi-square or Fisher exact tests for categorical variables.

Timeline:

- Week 1: Literature Review Finalization
- Week 2: Instrument design and pilot testing
- Week 3-7: Data Collection
- Week 8-9: Data Analysis
- Week 10: Drafting Findings
- Week 11: Final proposal submission

Expected Outcome:

Results are expected to provide a comprehensive evaluation of the prevalence³ of sarcopenia and its association with clinical outcomes in heart failure among old aged people with preserved and reduced Ejection fraction.

Potential Limitations:

This study is limited to old aged people, so the finding can not be generalized to younger HF patients

[5] Conclusion:

Sarcopenia is highly prevalent among those with heart failure.⁴ There is an urgent need to incorporate screening and diagnosing sarcopenia as a regular practice and on a larger scale in these patients, which will help in guiding management.

Post-program plan:

After further collaboration with researchers for guidance and clarification, the results will be published as a journal paper.

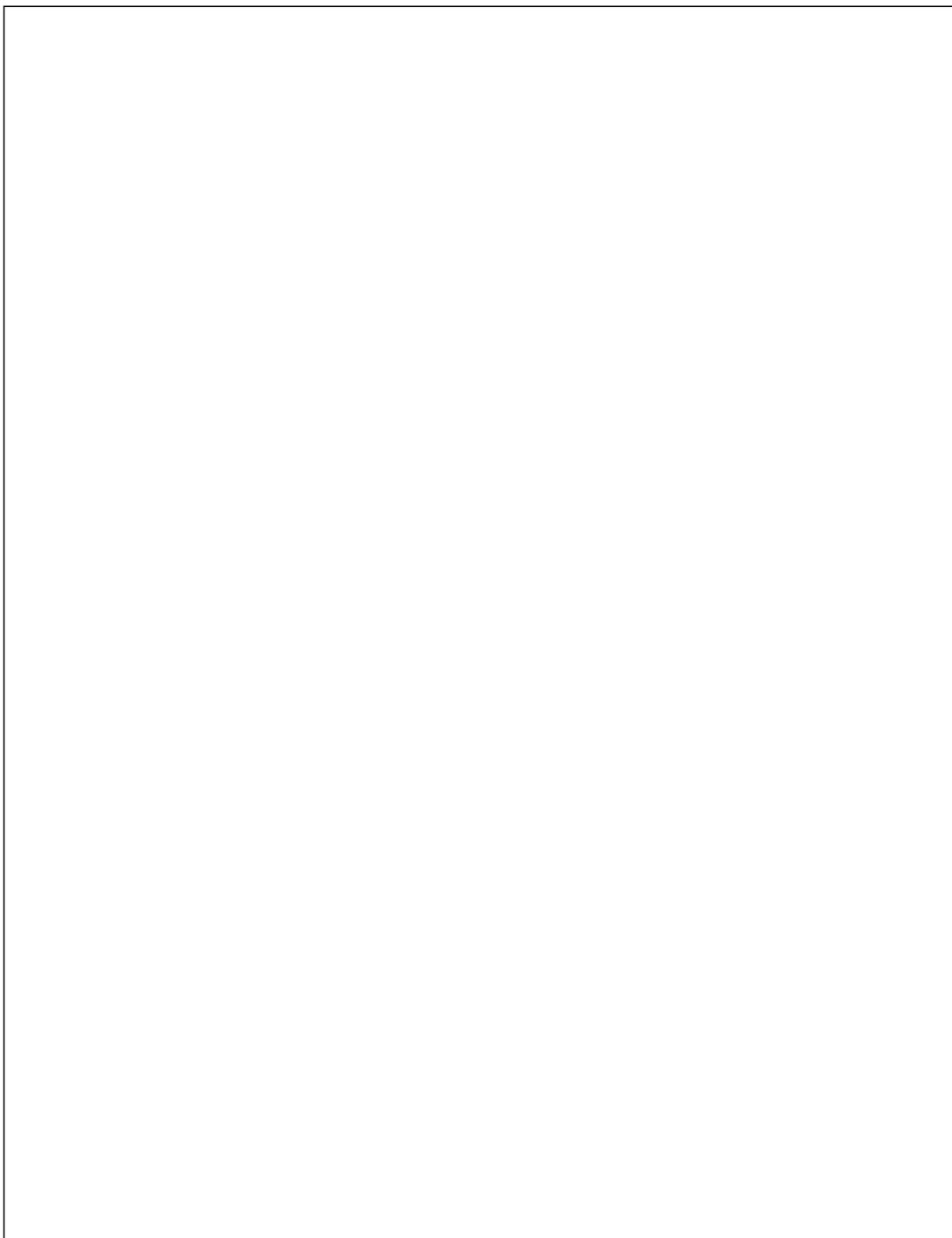
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