Quality of Life in Patients with Ischemic Dilated Cardiomyopathy: A Cross-Sectional Study

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Abstract

Background: Ischemic dilated cardiomyopathy (IDCM) is a chronic progressive cardiac disorder characterized by left ventricular dilatation and systolic dysfunction secondary to coronary artery disease. It is associated with significant morbidity, recurrent hospitalization, reduced functional capacity, and impaired quality of life (QoL). Evaluating QoL and its determinants is essential for improving patient-centered management strategies in individuals with IDCM.

Aim: To evaluate the quality of life and its associated socio-demographic and clinical determinants among patients with ischemic dilated cardiomyopathy.

Methods: This cross-sectional observational study was conducted at International Medical College & Hospital (IMCH), from January 2025 to December 2025, among 247 patients diagnosed with ischemic dilated cardiomyopathy. Data were collected using a structured questionnaire through face-to-face interviews and review of medical records. Socio-demographic variables, clinical characteristics, and QoL domains were assessed. Statistical analyses included descriptive statistics, independent sample t-test, one-way ANOVA, Pearson correlation analysis, and multiple linear regression. A p-value of <0.05 was considered statistically significant.

Results: The mean overall QoL score was 53.8 ± 11.2, indicating a moderate level of quality of life. The physical domain demonstrated the lowest mean score (48.7 ± 12.5), reflecting substantial physical impairment. Significant reductions in QoL were observed among smokers, diabetic patients, hypertensive patients, and individuals with advanced NYHA functional class. Age ($r = -0.318$), BMI ($r = -0.194$), and duration of disease ($r = -0.286$) showed significant negative correlations with QoL, whereas ejection fraction demonstrated a significant positive correlation ($r = 0.472$; $p<0.001$). Multiple linear regression analysis identified age, ejection fraction, NYHA functional class, diabetes mellitus, and smoking status as independent predictors of QoL.

Conclusion: Quality of life among patients with ischemic dilated cardiomyopathy is significantly influenced by functional status, cardiac performance, and modifiable cardiovascular risk factors. Comprehensive management focusing on optimization of cardiac function, control of comorbidities, and lifestyle modification may improve overall patient well-being.

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Introduction

Ischemic dilated cardiomyopathy (IDCM) is a chronic and progressive myocardial disorder characterized by left ventricular dilatation and impaired systolic function secondary to significant coronary artery disease and recurrent ischemic myocardial injury. It represents a major cause of heart failure worldwide and is associated with substantial morbidity, mortality, recurrent hospitalization, and healthcare burden. Despite remarkable advances in pharmacological therapy, revascularization strategies, and device-based interventions, many patients with IDCM continue to experience persistent symptoms, reduced functional capacity, and poor quality of life (QoL).[1] Heart failure due to ischemic cardiomyopathy is increasingly recognized as a multidimensional clinical condition that affects not only cardiovascular function but also physical, psychological, and social well-being. Symptoms such as dyspnea, fatigue, exercise intolerance, orthopnea, paroxysmal nocturnal dyspnea (PND), and peripheral edema significantly impair daily activities and limit patient independence.[2] Consequently, assessment of QoL has become an essential component of contemporary heart failure management, as survival alone does not adequately reflect the overall burden of disease.[3] The World Health Organization defines QoL as an individual's perception of their position in life within the context of culture, value systems, goals, expectations, and concerns.[3] In patients with IDCM, QoL is influenced by multiple factors including disease severity, left ventricular systolic dysfunction, functional status, comorbid conditions, psychological health, and socioeconomic determinants. Previous studies have demonstrated that patients with ischemic heart failure report significantly lower QoL compared with both the general population and patients with non-ischemic cardiomyopathy.[4] Cardiac remodeling and progressive ventricular dysfunction further contribute to worsening symptoms and clinical deterioration in these patients.[5] Functional classification systems such as the New York Heart Association (NYHA) classification remain widely used for assessing symptom severity and correlating clinical status with QoL outcomes. Patients in advanced NYHA functional classes often exhibit marked physical limitation, emotional distress, and social dependency.[6] However, NYHA classification alone may not fully capture the multidimensional nature of QoL, emphasizing the importance of validated assessment tools such as the Minnesota Living with Heart Failure Questionnaire (MLHFQ) and the SF-36 health survey.[7] Psychological comorbidities, particularly depression and anxiety, are highly prevalent among patients with IDCM and are independently associated with poor medication adherence, frequent hospital readmission, and increased mortality.[8] In addition, socioeconomic factors including low income, limited education, inadequate social support, and restricted access to specialized cardiac care substantially influence health-related QoL, especially in low- and middle-income countries. Ejection fraction (EF), an important indicator of left ventricular systolic function, has been shown to correlate with symptom burden, exercise intolerance, and hospitalization rates in patients with IDCM.[9,10] Nevertheless, echocardiographic findings do not always correspond with patient-reported outcomes, highlighting the importance of integrating subjective QoL assessment into routine clinical evaluation. Contemporary heart failure therapies, including angiotensin-converting enzyme inhibitors (ACEi), angiotensin receptor blockers (ARB), angiotensin receptor-neprilysin inhibitors (ARNI), beta-blockers, mineralocorticoid receptor antagonists, sodium-glucose cotransporter-2 (SGLT2) inhibitors, cardiac resynchronization therapy

(CRT), implantable cardioverter-defibrillators (ICDs), and revascularization procedures, have significantly improved survival and functional outcomes in selected patients.[11,12,13] However, many individuals continue to experience considerable limitations in daily living despite optimal medical and interventional management. The economic burden of heart failure, including repeated hospitalization and long-term treatment costs, also substantially affects patient well-being and healthcare systems.[14,15] Although several studies have evaluated QoL in heart failure populations, data specifically focusing on patients with ischemic dilated cardiomyopathy remain limited, particularly in South Asian and resource-constrained settings such as Bangladesh. Cultural perceptions, healthcare-seeking behavior, family support systems, and economic constraints may substantially influence patient-reported outcomes in this population. Therefore, the present study aims to evaluate the quality of life among patients with ischemic dilated cardiomyopathy and to identify the clinical, psychological, and socioeconomic factors associated with impaired QoL. A better understanding of these determinants may contribute to more comprehensive and patient-centered management strategies aimed at improving both survival and overall well-being.

Methods

This study was a cross-sectional observational study conducted at International Medical College & Hospital (IMCH) from January 2025 to December 2025. The study aimed to assess socio-demographic and clinical characteristics, quality of life (QoL), and their associations among patients with ischemic dilated cardiomyopathy (IDCM).

Study Population and Sample Size

A total of 247 patients diagnosed with ischemic dilated cardiomyopathy were included in the study. All participants were selected based on predefined inclusion and exclusion criteria.

Inclusion Criteria

Patients were included in the study if they met the following criteria:

- Confirmed diagnosis of ischemic dilated cardiomyopathy based on clinical evaluation and echocardiographic findings
- Age ≥ 30 years
- Both male and female patients
- Clinically stable patients attending outpatient or inpatient services during the study period
- Willingness to participate and provide informed consent

Exclusion Criteria

Patients were excluded from the study if they met any of the following criteria:

- Acute myocardial infarction or acute decompensated heart failure at the time of assessment
- Presence of severe comorbid conditions such as advanced renal failure, chronic liver disease, or malignancy
- History of major psychiatric illness affecting reliable response to questionnaires

Data Collection Procedure

Data were collected using a structured questionnaire through face-to-face interviews and review of medical records. The questionnaire included socio-demographic variables (age, gender, residence, education, smoking status) and clinical variables (hypertension, diabetes mellitus, NYHA functional class, BMI, ejection fraction, and duration of disease). Quality of life was assessed across physical, psychological, social, and environmental domains, and an overall QoL score was calculated.

Variables of the Study

The dependent variable was the overall quality of life score. Independent variables included age, gender, smoking status,

hypertension, diabetes mellitus, NYHA functional class, BMI, ejection fraction, and duration of disease.

Statistical Analysis

Data were analyzed using statistical software (e.g., SPSS). Descriptive statistics were used to summarize participant characteristics. Independent sample t-test and one-way ANOVA were used for group comparisons. Pearson correlation analysis was performed for continuous variables, and multiple linear regression analysis was conducted to identify independent predictors of overall QoL. A p-value of <0.05 was considered statistically significant.

Result

This study was a cross-sectional observational study conducted at International Medical College & Hospital (IMCH) from January 2025 to December 2025. A total of 247 patients diagnosed with ischemic dilated cardiomyopathy were included in the study.

Figure 1 The column chart illustrates the age distribution of the study participants. The highest proportion of participants belonged to the 51–60 years' age group (35.6%), followed by those aged 41–50 years (27.9%). Participants aged more than 60 years constituted 21.1%, whereas the 30–40 years' age group represented the lowest proportion (15.4%). These findings indicate that the study population was predominantly composed of middle-aged and older adults.

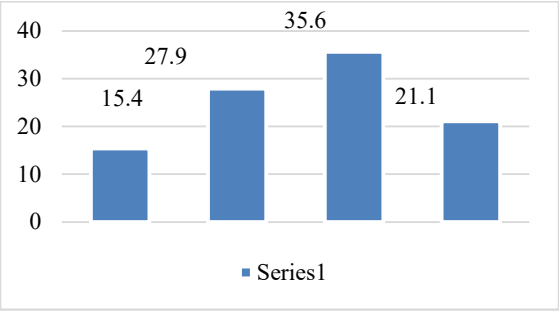

Figure 1. Age Distribution of the Participants

Figure 2: The pie chart demonstrates the gender distribution of the participants. A substantial majority of the respondents were male (70.4%), while female participants accounted for 29.6% of the study population. The results reveal a marked predominance of male participants in the study.

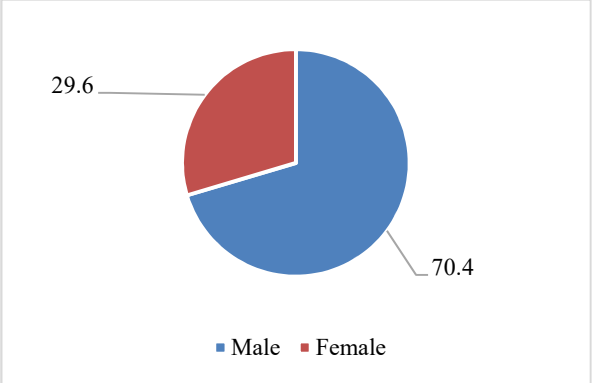

Figure 2. Gender Distribution of the Participants

Figure 3 The horizontal bar chart presents the residential status of the study participants. More than half of the respondents were from urban areas (57.1%), whereas 42.9% resided in rural areas. This finding suggests that urban residents were comparatively more represented in the study sample.

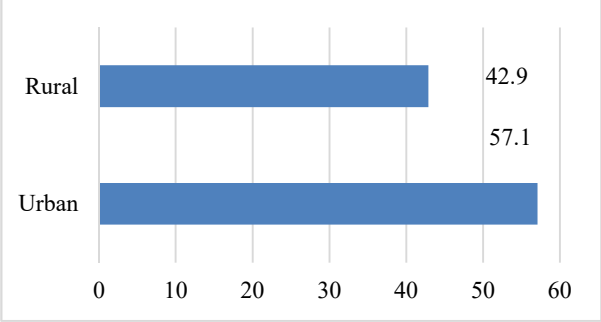

Figure 3. Residential Distribution of the Participants

Figure 4: The column chart depicts the educational attainment of the participants. The majority of the respondents had completed secondary-level education (44.1%), followed by those with primary-

level education (34.0%). Participants with higher education constituted 21.9% of the study population. The findings indicate that most participants possessed at least a secondary level of educational qualification.

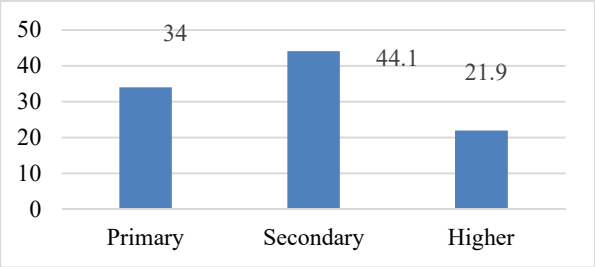

Figure 4. Educational Status of the Participants

Figure 5: The pie chart illustrates the smoking status of the respondents. Slightly more than half of the participants were non-smokers (51.8%), while 48.2% were identified as smokers. The distribution demonstrates a relatively balanced proportion between smokers and non-smokers within the study population.

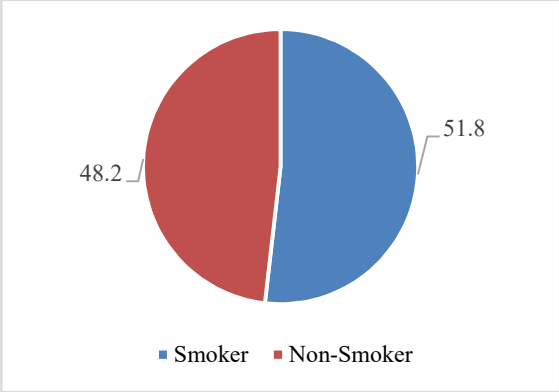

Figure 5. Smoking Status of the Participants

Table I**:** Clinical Characteristics of Patients with Ischemic Dilated Cardiomyopathy (N=247)

Variables	Frequency (n)	Percentage (%)
Hypertension		
Yes	169	68.4
No	78	31.6
Diabetes Mellitus		
Yes	121	49.0
No	126	51.0
NYHA Functional Class		
Class II	92	37.2
Class III	117	47.4
Class IV	38	15.4
Previous Hospitalization		
Yes	143	
No	104	42.1
Mean BMI (kg/m²)	25.6 ± 3.7	
Mean Ejection Fraction (%)	32.4 ± 6.8	
Duration of Disease (Years)	5.1 ± 2.9	

Table I shows the clinical profile of the participants. A considerable proportion of patients had hypertension (68.4%), while 49.0% had diabetes mellitus. Most patients were in NYHA Functional Class III (47.4%), followed by Class II (37.2%) and Class IV (15.4%), indicating that the majority were in moderate to severe functional limitation. More than half of the participants had a history of previous hospitalization (57.9%). The mean BMI was 25.6 ± 3.7 kg/m², suggesting an overweight tendency in the cohort. The mean left ventricular ejection fraction was 32.4 ± 6.8%, reflecting significantly reduced systolic function. The average duration of disease was 5.1 ± 2.9 years.

Table II: Quality of Life Scores among Patients with Ischemic Dilated Cardiomyopathy (N=247)

Domains of Quality of Life	Mean ± SD	Minimum	Maximum
Physical Domain	48.7 ± 12.5	20	82
Psychological Domain	52.9 ± 11.8	24	85
Social Domain	55.4 ± 13.1	22	88
Environmental Domain	58.1 ± 10.9	30	86
Overall Quality of Life	53.8 ± 11.2	25	84

Table II presents the quality of life (QoL) scores across different domains. The highest mean score was observed in the environmental domain (58.1 ± 10.9), followed by the social domain (55.4 ± 13.1) and psychological domain (52.9 ± 11.8). The physical domain showed comparatively lower scores (48.7 ± 12.5), indicating greater impairment in physical functioning. The overall quality of life score was 53.8 ± 11.2, suggesting a moderate level of QoL among patients with ischemic dilated cardiomyopathy.

Table III: Association between Socio-Clinical Variables and Overall Quality of Life (N=247)

Variables	Mean QOL Score ± SD	t/F value	p-value
Gender		2.18	0.030
Male	55.1 ± 10.8		
Female	50.7 ± 11.6		
Smoking Status		3.04	0.003
Smoker	50.9 ± 11.3		
Non-Smoker	56.8 ± 10.2		
Hypertension		2.56	0.011
Yes	51.9 ± 11.1		
No	57.8 ± 9.8		
Diabetes Mellitus		2.89	0.004
Yes	50.8 ± 10.7		
No	56.7 ± 10.9		
NYHA Functional Class		8.76	<0.001
Class II	61.5 ± 9.4		
Class III	52.1 ± 8.7		
Class IV	42.6 ± 7.9		

*Statistically significant at p<0.05

Independent sample t-test was applied for dichotomous variables and one-way ANOVA was applied for NYHA functional class.

Table III demonstrates significant associations between socio-clinical variables and overall QoL scores. Male patients had significantly higher QoL scores compared to females (55.1 ± 10.8 vs 50.7 ± 11.6; p=0.030). Smokers had significantly lower QoL compared to non-smokers (50.9 ± 11.3 vs 56.8 ± 10.2; p=0.003). Similarly, patients with hypertension and diabetes mellitus showed significantly reduced QoL scores (p=0.011 and p=0.004, respectively). A highly significant difference was observed across NYHA functional classes (p<0.001), where QoL progressively decreased with worsening functional status, with Class II patients having the highest scores and Class IV the lowest.

Table IV: Pearson Correlation Between Clinical Parameters and Overall Quality of Life Score (N=247)

Variables	Correlation Coefficient (r)	p-value
Age	-0.318	<0.001
BMI	-0.194	0.002
Ejection Fraction	0.472	<0.001
Duration of Disease	-0.286	<0.001

*Pearson correlation test applied

Table IV shows significant correlations between clinical variables and QoL scores. Age demonstrated a moderate negative correlation with QoL ($r = -0.318$, $p<0.001$), indicating that QoL decreases with increasing age. BMI also showed a weak negative correlation ($r = -0.194$, $p=0.002$). In contrast, ejection fraction showed a strong positive correlation with QoL ($r = 0.472$, $p<0.001$), indicating that better cardiac function is associated with improved QoL. Duration of disease had a negative correlation with QoL ($r = -0.286$, $p<0.001$), suggesting that longer disease duration is associated with poorer quality of life.

Table V: Multiple Linear Regression Analysis Predicting Overall Quality of Life (N=247)

Variables	B	Standard Error	Beta	p-value
Age	-0.221	0.067	-0.214	0.001
Ejection Fraction	0.584	0.092	0.401	<0.001
NYHA Functional Class	-4.813	1.106	-0.298	<0.001
Diabetes Mellitus	-3.125	1.224	-0.167	0.011
Smoking Status	-2.876	1.139	-0.153	0.013

$R^2 = 0.42$
Adjusted $R^2 = 0.40$
*Statistically significant at $p<0.05$

Table V presents the predictors of overall QoL using multiple linear regression analysis. The model explained 42% of the variance in QoL ($R^2 = 0.42$; Adjusted $R^2 = 0.40$), indicating a moderate explanatory power. Age was a significant negative predictor of QoL ($B = -0.221$, $p=0.001$), while ejection fraction was a strong positive predictor ($B = 0.584$, $p<0.001$). NYHA functional class showed a significant negative association with QoL ($B = -4.813$, $p<0.001$), indicating that worsening functional status reduces QoL substantially. Additionally, diabetes mellitus ($B = -3.125$, $p=0.011$) and smoking status ($B = -2.876$, $p=0.013$) were also significant negative predictors of QoL.

Discussion

The present study evaluated the socio-demographic, clinical characteristics, and quality of life (QoL) profile of patients with ischemic dilated cardiomyopathy, demonstrating a predominantly middle-aged to older adult, male-dominated cohort with significant comorbid burden and reduced functional status. Overall QoL was moderate (53.8 ± 11.2), with marked impairment in physical functioning, reflecting the chronic and progressive nature of the disease and its impact on daily activities.[16] The age distribution in this study showed a higher concentration of patients in the 51–60 years group with a mean age of 54.8 years, indicating that ischemic cardiomyopathy predominantly affects the economically active age group. Similar age patterns have been reported in previous cardiovascular studies, where advancing age was consistently associated with worsening cardiac function and reduced QoL due to cumulative atherosclerotic burden and reduced physiological reserve.[17] The observed

negative association between age and QoL in the present study further strengthens this relationship, suggesting that older patients experience greater functional limitation and psychological stress.[18] Gender distribution revealed a significantly higher proportion of male patients (70.4%), which is consistent with established epidemiological trends of ischemic heart disease being more prevalent in males. Prior research has indicated that hormonal, behavioral, and lifestyle differences contribute to this disparity, with men being more exposed to risk factors such as smoking and occupational stress.[19] In the current study, females exhibited lower QoL scores compared to males, which may reflect delayed diagnosis, higher symptom burden at presentation, and reduced access to healthcare services in certain settings.[20] A notable finding of this study was the high prevalence of smoking (51.8%), which was significantly associated with reduced QoL. Smoking is a well-established modifiable risk factor that accelerates atherosclerosis and worsens myocardial function. Similar findings have been reported where smokers with cardiomyopathy exhibited poorer functional capacity and increased symptom severity compared to non-smokers.[21] The negative impact of smoking on QoL observed in this study highlights the importance of aggressive smoking cessation interventions in this patient population.[22] The high prevalence of hypertension (68.4%) and diabetes mellitus (49.0%) reflects the clustering of cardiovascular risk factors in ischemic cardiomyopathy patients. These comorbidities significantly contribute to myocardial remodeling and disease progression. Previous studies have consistently demonstrated that patients with multiple comorbid conditions experience significantly lower QoL due to compounded physical limitations and increased treatment burden.[23] In the present study, both hypertension and diabetes were significantly associated with reduced QoL scores, supporting this evidence. Functional status assessed by the NYHA classification showed a strong gradient effect on QoL, where patients in Class IV had the lowest scores. This finding is in agreement with earlier studies demonstrating that NYHA class is one of the strongest predictors of QoL in heart failure patients.[24] The progressive decline in QoL with worsening functional class reflects increasing dyspnea, fatigue, and reduced exercise tolerance, which severely restrict daily living activities. Ejection fraction was found to be a strong positive predictor of QoL, indicating that better left ventricular systolic function is associated with improved patient-reported outcomes. This aligns with previous research where reduced ejection fraction was linked to higher symptom burden and hospitalization rates.[25] The strong correlation between cardiac function and QoL in this study emphasizes the importance of early detection and optimization of ventricular function. The mean BMI in the present study indicated an overweight tendency, and BMI showed a weak but significant negative correlation with QoL. Similar findings have been reported in prior studies, where higher BMI was associated with reduced physical capacity and increased cardiovascular risk.[26] However, the relationship between BMI and QoL is often complex, as some studies have suggested an "obesity paradox" in heart failure populations, which may explain the weak correlation observed.[27] Disease duration was also negatively correlated with QoL, suggesting that prolonged illness leads to cumulative physical and psychological burden. Chronic exposure to symptoms, repeated hospitalizations, and medication side effects likely contribute to declining QoL over time. Similar longitudinal analyses have shown that longer disease duration is associated with increased depression, anxiety, and functional decline.[28] The multiple linear regression analysis in this study identified age, ejection

fraction, NYHA class, diabetes mellitus, and smoking status as significant predictors of QoL, explaining 42% of the variance. This indicates a moderate explanatory power and suggests that QoL in ischemic cardiomyopathy is multifactorial. Previous predictive models in heart failure populations have also demonstrated that both clinical and behavioral factors jointly influence patient outcomes.[29] The strong negative impact of NYHA class and diabetes mellitus highlights the importance of comprehensive disease management strategies. Overall, the findings of this study are consistent with existing literature indicating that QoL in ischemic dilated cardiomyopathy is significantly impaired and influenced by a combination of demographic factors, comorbidities, and cardiac functional status. The integration of clinical optimization, risk factor modification, and patient-centered care is essential to improve outcomes in this population.[30]

Conclusion

This study demonstrated that patients with ischemic dilated cardiomyopathy experience a moderate impairment in quality of life, with the physical domain being the most affected. Advancing age, smoking, diabetes mellitus, hypertension, longer disease duration, and worsening NYHA functional class were significantly associated with poorer quality of life, whereas higher left ventricular ejection fraction was associated with better outcomes. Among all predictors, NYHA functional class and left ventricular ejection fraction exerted the strongest influence on overall quality of life. These findings suggest that both clinical severity and modifiable cardiovascular risk factors play crucial roles in determining patient well-being. Therefore, comprehensive management strategies focusing on optimization of cardiac function, control of comorbidities, smoking cessation, and regular follow-up may substantially improve the quality of life of patients with ischemic dilated cardiomyopathy.

Limitations

Several limitations should be considered while interpreting the findings of this study. First, the cross-sectional design limits the ability to establish causal relationships between socio-clinical variables and quality of life outcomes. Second, the study was conducted at a single tertiary care center with a relatively small sample size, which may limit the generalizability of the findings to the broader population. Third, the assessment of quality of life was based on self-reported responses, which may be influenced by recall bias and subjective perception. Furthermore, certain potentially influential factors, such as medication adherence, socioeconomic status, depression, and detailed echocardiographic parameters, were not comprehensively evaluated. Despite these limitations, the study provides valuable insight into the determinants of quality of life among patients with ischemic dilated cardiomyopathy and may serve as a foundation for future multicenter longitudinal studies.

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