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One-Year Outcomes of Patients Diagnosed with Peripartum dialted Cardiomyopathy: A 5-Year Multicenter Retrospective Cohort Study in Addis Ababa, Ethiopia

Thomas Atanfu

thomasasfaw26@gmail.com

Addis Ababa University

Kindalem Fentie

Mayo Clinic in Florida

Fraol Chinkey

Ambo University

Weys Neda

Uppsala University

Abigiya Berassa

Addis Ababa University

Desalew Mekonnen

Addis Ababa University

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Abstract

Background: Peripartum cardiomyopathy (PPCM) is an important cause of maternal heart failure associated with variable recovery and significant morbidity and mortality. Outcomes significantly differ from region to region with lower in high-income settings and very high in Africa and Asia. However, data from Ethiopia remain limited, particularly regarding one-year clinical and echocardiographic outcomes. Objective: To assess the one-year clinical and echocardiographic outcomes of patients diagnosed with peripartum cardiomyopathy and to identify factors associated with poor outcomes. Methods: A multicenter retrospective cohort study was conducted across selected tertiary and private hospitals in Addis Ababa, Ethiopia. All women diagnosed with PPCM between January 2020 and December 2024 were included using a census sampling approach. Data were extracted from electronic medical records and supplemented by phone follow-up when necessary. The primary outcomes were one-year mortality, heart failure–related hospital admission, and one-year ejection fraction recovery. A composite poor outcome was defined as death, hospital admission, or non-recovery of left ventricular function. Results: A total of 61 patients were included in the analysis. Five patients (8.2%) died within one year of diagnosis. Among patients with available one-year echocardiographic data, 50.8% achieved recovery of left ventricular systolic function. The remaining patients demonstrated either partial recovery or persistent systolic dysfunction. Higher baseline New York Heart Association (NYHA) functional class (III–IV) was associated with poorer outcomes, including lower rates of ejection fraction recovery and increased likelihood of adverse clinical outcomes. Conclusion: PPCM in this Ethiopia's associated with measurable mortality, significant morbidity and heterogeneous recovery of left ventricular function at one year. Only about half of patients achieved full recovery, with worse outcomes observed among those presenting with advanced heart failure and severely reduced ejection fraction. Outcomes appear more favorable than those reported in some African settings but remain inferior to those observed in high-income countries.

INTRODUCTION

Peripartum cardiomyopathy (PPCM) is a rare but potentially life-threatening form of heart failure that occurs toward the end of pregnancy or within the first months postpartum in previously healthy women. It is characterized by left ventricular systolic dysfunction, typically defined as a left ventricular ejection fraction (LVEF) below 45% in the absence of another identifiable cause of cardiomyopathy (9). Despite advances in heart failure management, PPCM remains an important contributor to maternal morbidity and mortality worldwide.

The burden of PPCM varies significantly across regions, with disproportionately higher incidence reported in Africa compared to Europe and North America (2,10). In some African settings, incidence rates as high as 1 in 100 to 1 in 1,000 live births have been reported (2). The etiology of PPCM is multifactorial, with proposed mechanisms including inflammatory processes, autoimmune responses, oxidative stress, abnormal angiogenic signaling, and hormonal factors such as the cardiotoxic prolactin fragment (9).

Clinical presentation typically includes symptoms of heart failure such as dyspnea, orthopnea, and peripheral edema, and in severe cases may progress to cardiogenic shock. Echocardiography remains the cornerstone for diagnosis and follow-up, providing essential information on ventricular function, chamber size, and complications such as intracardiac thrombus (9).

There is a substantial global shortage of high-quality evidence regarding the outcomes of peripartum dilated cardiomyopathy. In particular, prospective cohort studies and randomized controlled trials remain limited, with most available evidence derived from small observational studies conducted in diverse geographic and healthcare settings (10). Reported outcomes vary considerably across these studies, reflecting differences in patient populations, healthcare infrastructure, diagnostic practices, and treatment availability. Consequently, the generalizability of existing findings to other populations, including the Ethiopian context, remains uncertain. This highlights the need for locally generated evidence to better characterize disease outcomes and inform context-specific clinical management and policy decisions.

A global systematic review and meta-analysis reported that approximately 58.7% of patients recover left ventricular function within one year, although recovery rates vary widely between regions (10). Patients in high-income countries, particularly in Europe and North America, tend to have better outcomes, with higher recovery rates and lower mortality, largely due to early diagnosis, structured follow-up, and access to guideline-directed medical therapy (4,10). In contrast, studies from sub-Saharan Africa have reported significantly higher mortality and lower recovery rates, often attributed to delayed presentation, limited access to care, and inconsistent follow-up (2,7).

African data on PPCM outcomes further highlight these disparities. Studies from Nigeria and other regions have demonstrated high mortality rates and persistent left ventricular dysfunction in a substantial proportion of patients (7). Similarly, a North African observational study reported ongoing systolic dysfunction and frequent hospitalizations at one year (3). In contrast, studies from Asia, such as Nepal, have shown intermediate outcomes, with moderate mortality and recovery rates (8).

In Ethiopia, available evidence on PPCM remains limited. Previous studies have primarily focused on the overall spectrum of cardiovascular disease or the prevalence and risk factors of dilated cardiomyopathy, without providing detailed longitudinal outcome data for PPCM patients (1,5,6). Consequently, there is a lack of locally generated evidence regarding one-year mortality, recovery of left ventricular function, rehospitalization rates, and predictors of adverse outcomes.

This gap in knowledge limits accurate prognostication, hinders the development of context-specific management strategies, and forces clinicians to rely on data from other regions that may not reflect the Ethiopian healthcare context. Therefore, this study aims to evaluate the one-year clinical and echocardiographic outcomes of patients with PPCM in a multicenter Ethiopian setting and to identify factors associated with poor outcomes.

METHODS

Study Design and Setting

A multicenter retrospective cohort study was conducted to evaluate the one-year clinical and echocardiographic outcomes of women diagnosed with peripartum cardiomyopathy (PPCM). The study was conducted in Addis Ababa, Ethiopia, across four healthcare institutions with established cardiology and echocardiography services: Tikur Anbessa Specialized Hospital, St. Paul's Hospital Millennium Medical College, St. Peter's Specialized Hospital, and Lancet General Hospital. These centers were selected because of their high patient volume and availability of specialized diagnostic facilities.

Study Population and Eligibility Criteria

The study included all women diagnosed with PPCM at the participating hospitals between January 1, 2020, and December 31, 2024.

Patients were included if they fulfilled the diagnostic criteria for PPCM: (1) development of heart failure during the last month of pregnancy or within five months postpartum, (2) absence of another identifiable cause of heart failure, and (3) left ventricular systolic dysfunction with left ventricular ejection fraction (LVEF) <45% on echocardiography (9). Additional inclusion criteria included age ≥18 years, availability of baseline echocardiographic data, and either documented one-year follow-up data or successful follow-up through telephone contact.

Patients were excluded if they had pre-existing cardiomyopathy, ischemic heart disease, significant valvular or congenital heart disease, incomplete baseline clinical data, or could not be reached after three telephone contact attempts.

Sample Size and Sampling Technique

Due to the rarity of PPCM, a total population (census) sampling approach was used, including all eligible cases identified during the study period. Previous Addis Ababa data identified approximately 69 PPCM cases among reproductive-aged women with dilated cardiomyopathy (5), and a larger sample size was anticipated through inclusion of multiple centers.

However, incomplete medical records, missing key variables, unavailable follow-up echocardiographic assessments, and unsuccessful telephone follow-up reduced the final sample size. A total of 61 patients met the eligibility criteria and were included in the analysis (Figure 1).

Data Collection and Sources

Data were collected from electronic medical records (EMR) and structured telephone follow-up. Extracted variables included demographic characteristics, clinical presentation, obstetric history,

diagnostic findings, echocardiographic parameters, treatment details, follow-up visits, and hospital readmissions.

For patients with incomplete follow-up documentation, telephone interviews were conducted with the patient or a first-degree relative to determine survival status, date and cause of death when applicable, heart failure-related hospitalizations outside participating centers, and follow-up echocardiographic findings.

Data collectors were trained before data extraction, and completed forms were reviewed by the principal investigator to ensure accuracy and completeness.

Variables and Operational Definitions

Dependent Variables

The primary outcomes were one-year mortality, heart failure-related hospitalization, and change in left ventricular ejection fraction. One-year mortality was defined as death from any cause occurring within 12 months of PPCM diagnosis, confirmed through EMR review or follow-up contact with family members. Heart failure hospitalization was defined as any unplanned admission due to worsening heart failure symptoms within one year of diagnosis. One-year LVEF was determined from follow-up echocardiography performed approximately 12 months after diagnosis.

Independent Variables

Collected independent variables included demographic, obstetric, clinical, echocardiographic, and treatment-related factors.

Demographic variables included age, parity, and residence status (urban or rural). Obstetric variables included timing of diagnosis (antepartum or postpartum), mode of delivery, and hypertensive disorders of pregnancy, including preeclampsia and eclampsia.

Clinical variables included New York Heart Association (NYHA) functional class at presentation and comorbidities such as hypertension and anemia.

Baseline echocardiographic variables included LVEF, left ventricular thrombus, right ventricular dysfunction, and pulmonary hypertension. Treatment-related variables included use of beta-blockers, angiotensin-converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), sodium-glucose cotransporter-2 (SGLT-2) inhibitors, mineralocorticoid receptor antagonists, diuretics, and other supportive therapies.

Operational Definitions

Baseline left ventricular systolic dysfunction was classified according to initial LVEF: mild dysfunction was defined as EF 40–45%, moderate dysfunction as EF 30–39%, and severe dysfunction as EF <30%.[12]

Recovery of left ventricular function at one year was categorized based on follow-up echocardiography. Recovered EF was defined as LVEF >50%. Partially recovered EF was defined as an improvement of ≥10 percentage points from baseline with a final EF >40% but ≤50%. Non-recovered EF was defined as improvement of <10 percentage points from baseline and/or a final EF <40%.[10]

A significant change in EF was defined as an absolute change of ≥10 percentage points from baseline, either improvement or decline.[11,12]

Statistical Analysis

Data were entered into Google Sheets and analyzed using SPSS version 27 or Stata version 17. Descriptive statistics were used to summarize baseline characteristics. Continuous variables were presented as means or medians, while categorical variables were summarized using frequencies and percentages.

One-year outcomes, including mortality, hospitalization, and changes in LVEF, were reported with corresponding 95% confidence intervals. Associations between clinical variables and outcomes were assessed using bivariate analysis. Chi-square or Fisher's exact tests were used for categorical variables, while independent t-tests or Mann–Whitney U tests were used for continuous variables. A p-value <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Boards of the Addis Ababa University Department of Internal Medicine before study initiation. As this was a retrospective study involving existing medical records, a waiver of written informed consent was granted for chart review.

For telephone follow-up, verbal informed consent was obtained from participants. When patients were unavailable, information was obtained from a first-degree relative after explanation of the study purpose. Patient confidentiality was maintained throughout the study, with all data anonymized using unique identification codes. Access to study data was restricted to the research team.

Result

A total of 61 women diagnosed with peripartum cardiomyopathy (PPCM) were included in the study. Tikur Anbessa Specialized Hospital contributed the largest proportion of cases (24, 39.3%), followed by St. Paul's Hospital Millennium Medical College (22, 36.1%), St. Peter Hospital (9, 14.8%), and Lancet General Hospital (6, 9.8%).

The mean age of participants was 34.05 ± 5.90 years. More than half of the participants were aged 30–40 years (35, 57.4%), followed by those aged 18–29 years (17, 27.9%), while 9 (14.8%) were older than 40 years. Regarding residence, 33 (54.1%) participants were from rural areas and 28 (45.9%) were from urban settings. Detailed sociodemographic characteristics are presented in Table 1.

Among the 61 women, postpartum onset of PPCM was observed in 53 (89.8%) patients, while antepartum onset occurred in 6 (10.2%). Parity information was available for 30 participants; among these, 10 (33.3%) were primiparous, 17 (56.7%) were multiparous, and 3 (10.0%) were grand multiparous. Preeclampsia was documented in 9 of 58 patients with available data (15.5%), while no cases of eclampsia were reported.

At diagnosis, most patients presented with advanced heart failure symptoms. Among the 51 patients with available NYHA functional class data, 35 (68.6%) were classified as NYHA class IV, 11 (21.6%) as class III, 4 (7.8%) as class II, and 1 (2.0%) as class I.

The mean baseline left ventricular ejection fraction (LVEF) was 30.5% (range 15–45%). Severe left ventricular systolic dysfunction (LVEF <30%) was present in 26 (42.6%) patients, moderate dysfunction (LVEF 30–40%) in 19 (31.1%), and mild dysfunction (LVEF >40%) in 16 (26.2%). Left ventricular thrombus was identified in only one patient (1.6%) (Table 1).

Regarding comorbidities, 38 (62.3%) patients had no documented comorbidity. Among the 23 patients with comorbidities, anemia and atrial fibrillation were each present in 3 patients (13.0%), while other comorbid conditions accounted for 17 patients (73.9%).

Characteristic	Category	Frequency (n)	Percent (%)
Age (N=61)	18-29 Years	17	27.9
	30-40 Years	35	57.4
	>40 Years	9	14.8
	Total	61	100.0
Hospital (n=61)	TASH	24	39.3
	SPHMMC	22	36.1
	St Peter	9	14.8
	Lancet General Hospital	6	9.8
	Total	61	100.0
Residence (n=61)	Urban	28	45.9
	Rural	33	54.1
	Total	61	100
Onset (n=59)	Antepartum	6	10.2
	Postpartum	53	89.8
	Total	59	100
Parity (n=30)	Primiparous (1 delivery)	10	33.3
	Multiparous (2–4 deliveries)	17	56.7
	Grand Multiparous (≥5 deliveries)	3	10
	Total	30	100
Preeclampsia (n=58)	No	49	84.5
	Yes	9	15.5
	Total	58	100
Eclampsia	No	61	100
Mean Ejection fraction during diagnosis (n=61)	**30.5% (±8.59%) Range (15–45%)**	61	
NYHA Class at Diagnosis (n=51)	I	1	2
	II	4	7.8

	III	11	21.6
	IV	35	68.6
	Total	51	100
Grade of LVSD (LVEF %) (N=61)	Mild (>40%)	16	26.2
	Moderate (30–40%)	19	31.1
	Severe (<30%)	26	42.6
	Total	61	100
Left Ventricular Thrombus	No	60	98.4
	Yes	1	1.6
	Total	61	100
Comorbidities	None	38	62.3
	Present	23	37.7
	Total	61	100
Type of Comorbidities (n=23)	Anemia	3	13.04%
	Atrial Fibrillation (alone)	3	13.04%
	Other comorbidities	17	73.91%
	Total	23	100.00%

Table 1 The baseline demographic, Obstetric and Clinical Characteristics of Women with Peripartum Cardiomyopathy

Most patients received standard heart failure therapy. ACE inhibitors and beta-blockers were prescribed in 56 patients (91.8%) each, while diuretics were used in 50 patients (82.0%). Mineralocorticoid receptor antagonists were prescribed in 41 patients (67.2%), whereas SGLT2 inhibitors were used in only 9 patients (14.8%). Digoxin was used in 5 patients (8.2%), and bromocriptine was prescribed in only 1 patient (1.6%). Medication history is summarized in Table 2.

		Frequency	Percent
ACE inhibitor	No	5	8.2
	Yes	56	91.8
	Total	61	100.0
Betablocker	No	5	8.2
	Yes	56	91.8
	Total	61	100.0
Diuretics	No	11	18.0
	Yes	50	82.0
	Total	61	100.0
SGLT2-inhibitors	No	52	85.2
	Yes	9	14.8
	Total	61	100.0
MRA	No	20	32.8
	Yes	41	67.2
	Total	61	100.0
Digoxin	No	56	91.8
	Yes	5	8.2
	Total	61	100.0
Bromocriptine	No	60	98.4
	Yes	1	1.6
	Total	61	100.0

Table2: Medication history of Women with Peripartum Cardiomyopathy (n = 61) in Major Hospitals in Addis Ababa, Ethiopia

At one-year follow-up, repeat echocardiography was available for 52 patients. The median LVEF was 53.75% (IQR 40–60), with values ranging from 20% to 65%. The mean improvement in LVEF from baseline was 17.88 ± 10.36%, with a median improvement of 20% (IQR 10–25) (Figure 2).

Overall, 29 (50.8%) patients achieved recovery of left ventricular systolic function, defined as LVEF ≥50%, while 28 (49.2%) did not achieve complete recovery. Among those without recovery, 11 (19.2%) demonstrated partial recovery, defined as an improvement of ≥10 percentage points with a final LVEF

>40% but ≤50%. No patient experienced worsening of EF (decline ≥10%). A measurable improvement in EF of ≥10 percentage points was observed in 42 (73.6%) patients, whereas 12 (21.1%) had no significant recovery (Figure 3).

Among the 57 patients included in the subgroup analysis, recovery of left ventricular systolic function varied according to the severity of LV systolic dysfunction at diagnosis. Among patients with mild LV dysfunction, 12 (75.0%) achieved complete recovery, 0 (0.0%) had partial recovery, 3 (18.75%) remained non-recovered, and 1 (6.25%) died. Among patients with moderate LV dysfunction, 11 (57.9%) achieved complete recovery, 4 (21.1%) had partial recovery, 2 (10.5%) remained non-recovered, and 1 (5.25%) died. Among patients with severe LV dysfunction, 7 (26.9%) achieved complete recovery, 6 (23.0%) had partial recovery, 7 (26.9%) remained non-recovered, and 3 (11.5%) died. Complete recovery was therefore less frequent among patients with more severe LV systolic dysfunction at baseline.(figure 4)

During the one-year follow-up period, 5 (8.2%) patients died, while 56 (91.8%) remained alive. Heart failure-related hospitalization was common, with 27 of 55 patients with available hospitalization data (49.1%) experiencing at least one admission. Among hospitalized patients, 21 (77.8%) had one admission, 5 (18.5%) had two admissions, and 1 (3.7%) had three admissions (Table 3).

Outcome Variable	Category	Frequency (n)	Percent (%)
Ejection Fraction at 1 Year (n=52)	Median (IQR)	53.75% (40–60)	–
	Range	20–65%	–
Change in EF (n=52)	Mean ± SD	17.88 ± 10.36%	–
	Median (IQR)	20.0% (10–25)	–
	Range	0–40%	–
Recovery (EF ≥50%) (n=57)	Yes	29	50.8
	No	28	49.2
	Total	57	100
Improved: Partially recovered (EF increase ≥10% and 40–50%) (n=57)	Yes	11	19.2
	No	46	80.8
	Total	57	100
Worsened (EF decline ≥10% but not dead) (n=52)	Yes	0	0
	No	57	100
No significant recovery (change <10% and/or EF <40%) (n=57; excluding deaths)	Yes	12	21.1
	No	45	78.8
	Total	57	100
Mortality (n=61)	Dead	5	8.2
	Alive	56	91.8
	Total	61	100
Unplanned Hospital Admission (n=55)	Yes	27	49.1
	No	28	50.9
	Total	55	100
Number of unplanned admission (n=27)	One time	21	77.8
	Two times	5	18.5
	Three times	1	3.7

Total	27	100

Table 3 One-Year Clinical and Echocardiographic Outcomes of Women with Peripartum Cardiomyopathy in Major Hospitals in Addis Ababa, Ethiopia

The overall proportion of patients experiencing a poor outcome, defined as death, hospitalization, or failure to recover LVEF, was 35 (57.4%; 95% CI: 44.1–70.0).

Fisher's exact tests were performed to evaluate associations between clinical variables and overall outcome (good outcome versus poor outcome).

NYHA functional class at diagnosis was the only variable significantly associated with outcome (p=0.001). Patients presenting with higher NYHA class had a significantly greater proportion of poor outcomes.

No significant associations were identified between outcome and age category (p=0.814), comorbidities (p=0.286), atrial fibrillation (p=1.0), severity of LV systolic dysfunction (p=0.468), left ventricular thrombus (p=1.0), ACE inhibitor/ARB use (p=1.0), beta-blocker use (p=1.0), diuretic use (p=0.745), SGLT2 inhibitor use (p=0.725), mineralocorticoid receptor antagonist use (p=0.260), digoxin use (p=1.0), or bromocriptine use (p=0.407). A summary of factors associated with outcomes is presented in Table 4.

Factors	Category	Good Outcome (n=24)	Poor Outcome (n=35)	p-value*
Age	18-29 Years	8 (47.1%)	9 (52.9%)	0.814
	30-40 Years	13 (39.4%)	20 (60.6%)	
	>40 Years	3 (33.3%)	6 (66.7%)	
NYHA Class (n=49)	I	1 (100.0%)	0 (0.0%)	**0.001**
	II	4 (100.0%)	0 (0.0%)	
	III	7 (70.0%)	3 (30.0%)	
	IV	8 (23.5%)	26 (76.5%)	
Comorbidities	Absent	13 (35.1%)	24 (64.9%)	0.286
	Present	11 (50.0%)	11 (50.0%)	
Atrial Fibrillation	No	22 (40.0%)	33 (60.0%)	1
	Yes	2 (50.0%)	2 (50.0%)	
Grade of LVSD	Mild	7 (43.8%)	9 (56.3%)	0.468
	Moderate	9 (50.0%)	9 (50.0%)	
	Severe	8 (32.0%)	17 (68.0%)	

Table 4: Factors Affecting One-Year Outcome Among Women with Peripartum Cardiomyopathy (n=61)

Discussion

This multicenter retrospective cohort study provides one of the first comprehensive evaluations of one-year clinical and echocardiographic outcomes among women with peripartum cardiomyopathy (PPCM) in Ethiopia. In this cohort, PPCM was associated with substantial morbidity despite a relatively moderate mortality rate. Among 61 women, one-year mortality was 8.2%, nearly half experienced at least one heart failure–related hospitalization (49.1%), and 50.8% achieved recovery of left ventricular systolic function. Overall, more than half of patients (57.4%) experienced a composite poor outcome, highlighting that the burden of PPCM extends beyond mortality alone.

The observed mortality rate of 8.2% is comparable to reported global estimates, where one-year mortality among PPCM patients is generally around 5–10%, but remains substantially lower than that reported in several African cohorts. Systematic reviews and meta-analyses of PPCM outcomes in Africa have reported one-year mortality rates ranging from 9.8% to 21.4%. These findings are consistent with broader evidence demonstrating higher mortality rates in low-resource settings compared with high-income regions, likely reflecting disparities in healthcare infrastructure, early diagnosis, and access to guideline-directed medical therapy. (7,10). In contrast, mortality rates from Asian settings, such as Nepal,

have been reported between 10–15%, whereas high-income countries have reported rates as low as 4.1% (4,8). These regional differences likely reflect variations in healthcare infrastructure, access to echocardiography, timing of diagnosis, and availability of guideline-directed medical therapy (10).

The relatively lower mortality observed in this study may be related to improved access to tertiary cardiovascular care in Addis Ababa, earlier recognition of disease, and increased availability of standard heart failure therapies. However, this finding should be interpreted cautiously, as retrospective studies may underestimate mortality due to incomplete documentation and loss to follow-up. Furthermore, PPCM remains a unique form of heart failure because it affects young women during the peripartum period and carries important long-term cardiovascular and reproductive consequences despite relatively favorable short-term survival.

Recovery of left ventricular function is a major determinant of prognosis in PPCM. In this study, 50.8% of patients achieved recovery of systolic function at one year, which is consistent with findings from a large systematic review and meta-analysis reporting recovery rates of approximately 44% at six months and 58.7% at twelve months (10). Previous studies have demonstrated substantial regional variation, with higher recovery rates reported in Europe and North America compared with low- and middle-income regions, likely due to differences in early diagnosis, follow-up systems, and access to guideline-directed therapy (10).

The recovery rate observed in this Ethiopian cohort is therefore notable, given the historically poorer outcomes reported from many African settings. However, nearly half of patients failed to achieve complete recovery, emphasizing the persistent burden of ventricular dysfunction. Severe left ventricular systolic dysfunction at presentation was associated with lower recovery rates, consistent with previous studies demonstrating that reduced baseline ejection fraction predicts delayed or incomplete recovery and increased long-term risk (13,14). These findings highlight the importance of early identification of high-risk patients and timely optimization of heart failure therapy. Bromocriptine, which inhibits prolactin secretion and reduces production of the cardiotoxic 16-kDa prolactin fragment implicated in PPCM pathogenesis, has demonstrated potential benefits in improving ventricular recovery when added to standard therapy (10,13,18). However, its use remains limited in many African settings because of its effect on lactation.

The high rate of heart failure hospitalization observed in this study (49.1%) further demonstrates that mortality alone does not capture the full burden of PPCM. Similar patterns of recurrent heart failure and rehospitalization have been reported in other African cohorts (3). The composite poor outcome observed in 57.4% of patients reflects the chronic nature of PPCM and emphasizes the importance of considering functional recovery and morbidity when evaluating disease impact.

Among clinical predictors evaluated, advanced NYHA functional class at presentation was significantly associated with poor outcomes. This finding aligns with previous studies identifying severity of heart failure at diagnosis as an important prognostic marker in PPCM (9). Advanced NYHA class likely reflects delayed presentation and more severe myocardial injury. Other variables, including age, baseline ejection

fraction, and treatment characteristics, were not significantly associated with outcomes, likely due to limited sample size and the relatively small number of outcome events.

Most patients received conventional heart failure therapy, including ACE inhibitors, beta-blockers, and diuretics; however, bromocriptine use was uncommon. This reflects ongoing challenges in access to specialized PPCM therapies in low-resource settings (2). Strengthening access to evidence-based therapies and improving coordination between obstetric and cardiology services may contribute to earlier diagnosis and improved outcomes. Since PPCM symptoms may overlap with normal pregnancy-related changes, integrated referral pathways and increased awareness among healthcare providers are essential for timely recognition.

This study has several strengths, including its multicenter design, assessment of both clinical and echocardiographic outcomes, and use of telephone follow-up to improve outcome ascertainment. Importantly, it addresses a significant gap in Ethiopian literature, where previous studies have primarily focused on clinical characteristics and risk factors rather than longitudinal outcomes (1,5,6). It also contributes to the global data regarding PPCM where there is a significant scarcity.

Several limitations should also be considered. The retrospective design resulted in incomplete documentation of some variables, including obstetric characteristics, comorbidities, and follow-up echocardiographic parameters. The small sample size and limited number of mortality events reduced statistical power for identifying independent predictors. Additionally, outcome assessment relied mainly on left ventricular ejection fraction, while other echocardiographic markers such as ventricular remodeling, right ventricular function, and mitral regurgitation may also provide important prognostic information (19). Finally, as the study was conducted in tertiary referral centers, findings may not be fully generalizable to rural or primary healthcare settings.

In conclusion, PPCM in this Ethiopian multicenter cohort was associated with moderate mortality but substantial morbidity, with nearly half of patients experiencing hospitalization or persistent ventricular dysfunction. Outcomes appear more favorable than those reported in some African settings but remain inferior to those observed in high-income countries. Early diagnosis, improved postpartum cardiovascular follow-up, and coordinated multidisciplinary management are essential strategies to reduce the long-term burden of PPCM in Ethiopia.

List of Acronyms

ACEI Angiotensin-Converting Enzyme Inhibitor
ARB Angiotensin Receptor Blocker
CI Confidence Interval
DCMP / DCM Dilated Cardiomyopathy
EF / LVEF Ejection Fraction / Left Ventricular Ejection Fraction
ESC European Society of Cardiology
EMR Electronic Medical Record

HF Heart Failure
ICD International Classification of Diseases
IRB Institutional Review Board
LV Left Ventricle
LVEDD Left Ventricular End Diastolic Diameter
NYHA New York Heart Association (Functional Classification)
PPCM Peripartum Cardiomyopathy
RV Right Ventricle
SPHMMC St. Paul's Hospital Millennium Medical College
SPSS Statistical Package for the Social Sciences
TASH Tikur Anbessa Specialized Hospital
WHO World Health Organization

Declarations

Author Contributions

T.A contributed to conceptualization, methodology, software, formal analysis, data curation, project administration, and writing—original draft. K.F contributed to methodology, formal analysis, and writing—review and editing. F.C contributed to investigation, data curation, and writing—review and editing. W.N contributed to software, formal analysis, and data curation. A.B contributed to investigation, data curation, and visualization. D.M contributed to conceptualization, methodology, resources, and supervision. All authors reviewed and approved the final manuscript.

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Conflicts of Interest

The authors declare no conflicts of interest.

Patient and Public Involvement

Patients and members of the public were not involved in the design, conduct, reporting, or dissemination plans of this research. The study was a retrospective review of routinely collected clinical data, supplemented by telephone follow-up to ascertain study outcomes, and no patients or public representatives contributed to the development of the research question, study design, outcome measures, or interpretation of the findings.

Ethics Approval

The study was approved by the Institutional Review Board of the College of Health Sciences, Addis Ababa University. All study procedures were conducted in accordance with the Declaration of Helsinki and applicable institutional guidelines.

Clinical trial number: not applicable.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Figures

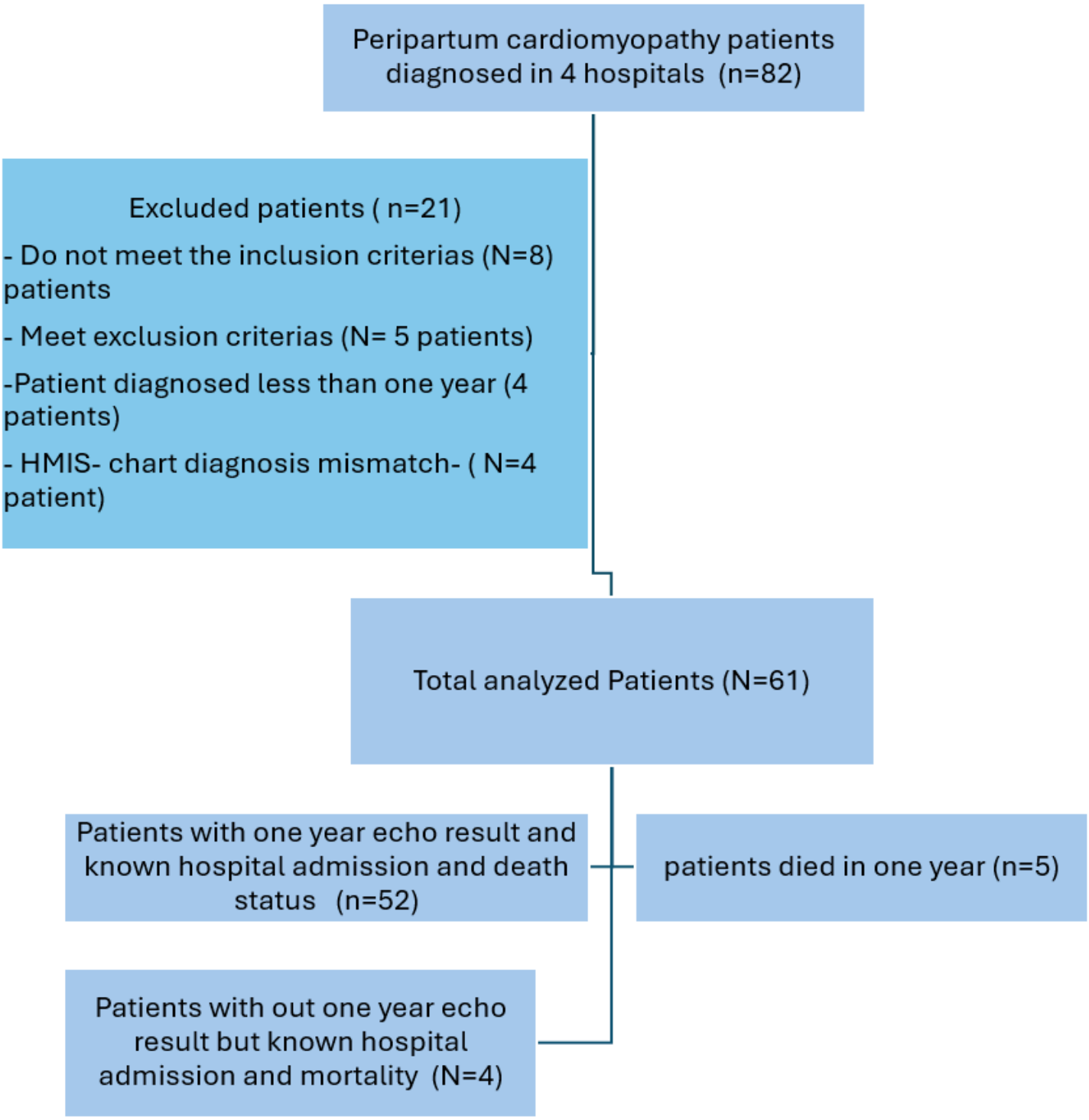


Figure 1

patient eligibility flow diagram Figure 1: patient eligibility flow diagram

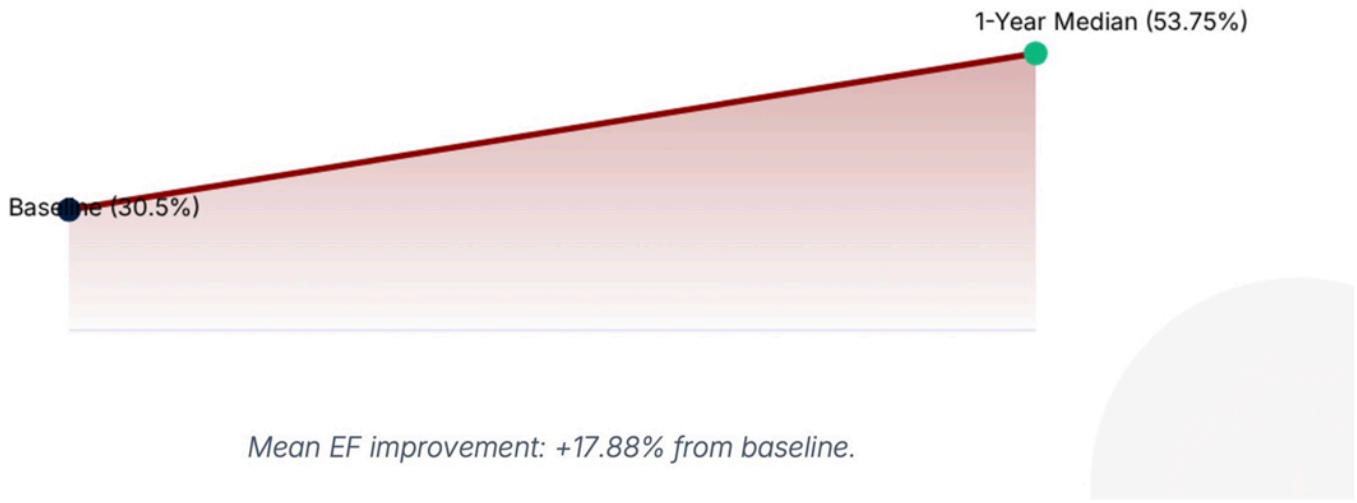


Figure 2

Ejection fraction Trend: Baseline to 1-Year

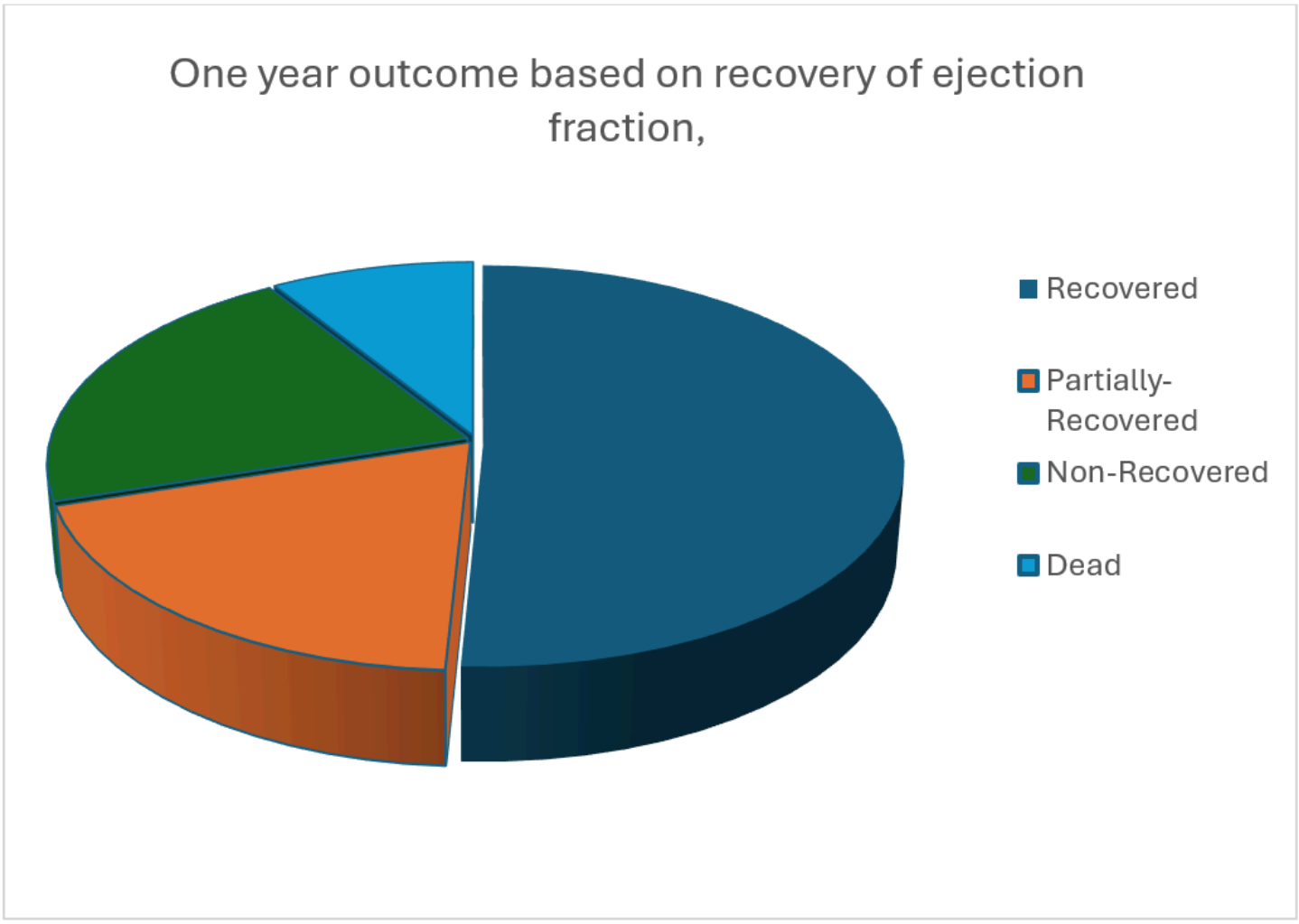


Figure 3

One-year ejection fraction outcome of 57 patients with one-year follow-up echocardiography

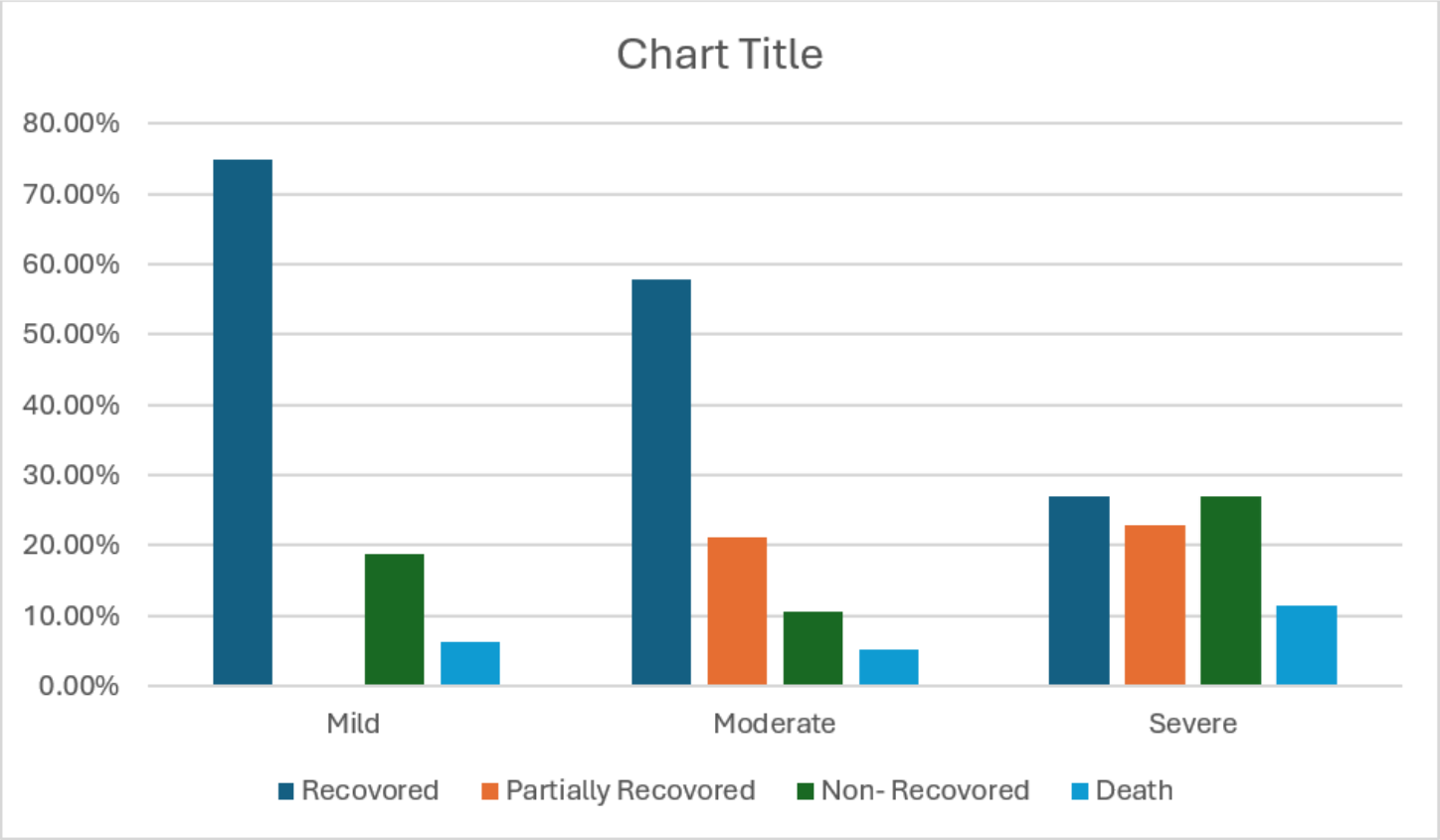


Figure 4

Subgroup analysis of one-year ejection fraction outcome based on the grade of left ventricular systolic dysfunction