

In Hospital Outcome of Patient with Bromocriptine in Peripartum Cardiomyopathy in Tertiary Care Hospital in Bangladesh

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ABSTRACT

Background: Peripartum cardiomyopathy (PPCM) is a heart failure associated with pregnancy that is rising in prevalence globally. Bromocriptine, a prolactin suppressor incorporated into standard treatment, has demonstrated enhanced recovery and fewer negative effects. Nonetheless, information from Bangladesh is scarce. This study evaluates in-hospital and short-term results of PPCM patients receiving bromocriptine in a tertiary care facility. **Methods & Materials:** A planned comparative interventional study in Bangladesh (2024) involved 40 PPCM patients divided into bromocriptine (n=20) or standard treatment (n=20). All participants received treatment according to guidelines, with evaluations at 1, 3, and 6 months to assess NYHA class and LVEF. The main outcome was an enhancement in LVEF, while secondary outcomes encompassed clinical recovery. Ethical consent and informed approval were secured. **Results:** Baseline characteristics were comparable across groups. LVEF showed a notable enhancement in the bromocriptine group at 1, 3, and 6 months (52.4% compared to 44.1% at 6 months, $p=0.003$). At 6 months, a greater proportion of patients reached NYHA Class I in the bromocriptine group (60% vs 35%, $p=0.02$), and recovery of LVEF $\geq 50\%$ was more pronounced (70% vs 40%, $p=0.04$), with fewer instances of severe dysfunction (5% vs 25%, $p=0.04$). Mortality rates were low and showed no significant difference (0 compared to 1 case). Adverse events were minor and similar across groups, with no significant drug-related incidents. **Conclusion:** The inclusion of Bromocriptine in standard therapy for PPCM markedly enhanced left ventricular function and functional status without raising adverse events, indicating improved clinical

outcomes with a favorable safety profile.

Keywords: Bromocriptine, Peripartum Cardiomyopathy, Hospital Outcome.

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INTRODUCTION

Peripartum cardiomyopathy (PPCM) is a severe heart failure characterized by newly developed LV dysfunction during late pregnancy or within 5 months after childbirth, without an alternative cause, and significantly impacts maternal health and survival rates ^[1,2]. PPCM is a global phenomenon, with incidence rates varying from approximately 1 in 900 to 1 in 4000 births, and these rates are rising over time. This increase is associated with older maternal age, pre-eclampsia, multiple gestations, and elevated levels of cardiovascular risk factors including hypertension, diabetes, and obesity ^[3,4]. The management of PPCM requires a multidisciplinary approach involving heart failure-directed therapy and obstetric care. The European Society of Cardiology recommends a structured “BROAD” strategy, which includes bromocriptine, oral heart failure medications, anticoagulation, vasodilators (nitrates/hydralazine), and diuretics ^[5]. Among these, bromocriptine has gained increasing attention as a disease-modifying agent. Bromocriptine, a dopamine D2 agonist launched in the 1980s, suppresses prolactin and is utilized in PPCM due to its underlying mechanisms ^[6]. Bromocriptine exhibits low oral bioavailability (<10%)

because of first-pass metabolism, is extensively protein-bound, undergoes metabolism through cytochrome P450, and is primarily eliminated by the liver. It has been utilized for a long time in prolactinoma, galactorrhea, type 2 diabetes, acromegaly, and Parkinson’s disease ^[7,8]. Multicenter randomized trials and systematic reviews/meta-analyses have shown that adding bromocriptine to standard therapy in PPCM improves left ventricular function, increases the rate of ejection fraction normalization, and enhances overall cardiac recovery compared to standard treatment alone. These studies also report reduced severe outcomes, including mortality and the need for mechanical circulatory support, supporting bromocriptine as an effective adjunct therapy in PPCM ^[9,10]. In Bangladesh, evidence remains limited. Fatema et al. (2018) reported that most PPCM patients presented with severe heart failure and markedly reduced ejection fraction. Although many patients improved with standard therapy, a subset continued to have persistent LV dysfunction or poor outcomes, highlighting the need for early diagnosis and optimized management strategies ^[11]. Despite increasing global evidence, data on bromocriptine use and in-hospital outcomes of PPCM in the

Bangladeshi population are still scarce. Therefore, this study aims to evaluate the in-hospital and short-term outcomes of PPCM patients treated with bromocriptine in a tertiary care hospital in Bangladesh.

METHODS & MATERIALS

Study design and setting

This was a prospective comparative interventional study conducted in a tertiary care hospital in Bangladesh. The study aimed to evaluate in-hospital and short-term outcomes of bromocriptine therapy in women diagnosed with peripartum cardiomyopathy (PPCM).

Study period and population

The study was carried out over a 12-month enrollment period from January 2024 to December 2024. A total of 40 women diagnosed with PPCM were included. Participants were alternatively allocated into two groups: bromocriptine group (n = 20) and non-bromocriptine group (n = 20).

Intervention and treatment protocol

All patients in both groups received standard guideline-directed medical therapy for heart failure, including furosemide, enalapril, metoprolol, and spironolactone for a duration of 6 months.

In addition to standard therapy, the bromocriptine group received oral bromocriptine at a dose of 2.5 mg twice

daily for 15 days, followed by 2.5 mg once daily for 4 weeks.

Dapagliflozin and ivabradine were added selectively in both groups based on treating physician discretion and clinical indication.

Follow-up and clinical assessment

Patients were followed at 1 month, 3 months, and 6 months postpartum. At each follow-up visit, detailed clinical assessment was performed, including documentation of New York Heart Association (NYHA) functional class. Breastfeeding status was recorded during follow-up. Breastfeeding was discontinued in most patients, although a small proportion continued despite bromocriptine therapy, and some resumed breastfeeding after dose reduction or discontinuation of medications after 6 months. Medication adjustments were made based on clinical recovery. In patients who achieved left ventricular ejection fraction (LVEF) >50%, diuretics and dapagliflozin were discontinued selectively according to physician judgment, while metoprolol and enalapril were generally continued throughout the 6-month follow-up period.

Echocardiographic evaluation

Transthoracic echocardiography was performed using a MyLab X6 echocardiography system (Esaote, Genova, Italy) equipped with a 1–5 MHz transducer. All examinations were conducted by four experienced cardiologists. Standard two-

dimensional, M-mode, and color Doppler imaging were performed for all patients. Left ventricular (LV) dimensions and systolic function were assessed according to the American Society of Echocardiography (ASE) guidelines. Left ventricular ejection fraction (LVEF) was calculated using M-mode and the modified Simpson’s biplane method, utilizing the built-in software of the echocardiography machine.

Outcome assessment

The primary outcome was improvement in left ventricular systolic function, measured by change in LVEF over time. Secondary outcomes included NYHA functional class improvement and overall clinical recovery during the 6-month follow-up period.

Statistical analysis

Data were analyzed using standard statistical software (e.g., SPSS version 25 or equivalent). Continuous variables were expressed as mean ± standard deviation (SD) and categorical variables as frequencies and percentages. Comparisons between the bromocriptine and non-bromocriptine groups were performed using independent sample t-tests for continuous variables and Chi-square test or Fisher’s exact test for categorical variables, as appropriate. Within-group changes over time (baseline, 1 month, 3 months, and 6 months) were analyzed using repeated measures analysis or paired t-test where

applicable. A p-value of <0.05 was considered statistically significant.

Ethical considerations

The study was conducted following the principles of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee of the concerned tertiary care hospital prior to data collection. Written informed consent was obtained from all participants before enrollment. Patient confidentiality and anonymity were strictly maintained throughout the study. Participation was voluntary, and patients had the right to withdraw from the study at any stage without affecting their standard medical care.

RESULTS

Baseline characteristics

Table I shows the two groups were comparable at baseline. There were no statistically significant differences in age, parity, comorbid conditions (hypertension and diabetes mellitus), baseline left ventricular ejection fraction (LVEF), or NYHA functional class (p > 0.05 for all variables). The mean baseline LVEF was 28.6 ± 5.2% in the bromocriptine group and 29.1 ± 4.8% in the non-bromocriptine group, indicating similar severity of cardiac dysfunction at enrollment.

Table I
Baseline demographic and clinical characteristics of study participants.

Variables	Bromocriptine group (n=20), n (%)	Non-bromocriptine group (n=20), n (%)	p-value
Age (years, mean ± SD)	27.4 ± 4.6	28.1 ± 5.1	0.62
Primipara	12 (60)	11 (55)	0.75
Hypertension	3 (15)	4 (20)	0.67
Diabetes mellitus	2 (10)	1 (5)	0.55
Baseline LVEF	28.6 ± 5.2	29.1 ± 4.8	0.74
NYHA Class III–IV	16 (80)	17 (85)	0.68

Left ventricular ejection fraction (LVEF) over time

Table II presents both groups demonstrated progressive improvement in LVEF over the 6-month follow-up period. However, the bromocriptine group showed significantly greater improvement at all follow-up time

points compared with the non-bromocriptine group.

At 1 month, mean LVEF was significantly higher in the bromocriptine group (36.8 ± 6.1%) compared to the non-bromocriptine group (33.2 ± 5.9%, p = 0.04). The difference became more pronounced at 3 months (45.5 ± 6.8% vs 39.6 ± 6.4%, p =

0.01), and further increased at 6 months (52.4 ± 7.2% vs 44.1 ± 6.9%, p = 0.003). These findings indicate a significantly faster and greater recovery of left ventricular systolic function in patients receiving bromocriptine in addition to standard therapy.

Table II
Comparison of LVEF (%) between groups over time.

Time point	Bromocriptine group (mean ± SD)	Non-bromocriptine group (mean ± SD)	p-value
Baseline	28.6 ± 5.2	29.1 ± 4.8	0.74
1 month	36.8 ± 6.1	33.2 ± 5.9	0.04
3 months	45.5 ± 6.8	39.6 ± 6.4	0.01
6 months	52.4 ± 7.2	44.1 ± 6.9	0.003

NYHA functional class improvement

Table III shows at 6 months, a higher proportion of patients in the bromocriptine group achieved NYHA Class I compared to the non-bromocriptine group (60% vs 35%,

p = 0.02). Overall, 90% of patients in the bromocriptine group improved to NYHA Class I–II compared to 75% in the control group. Fewer patients remained in NYHA Class III–IV in the bromocriptine group,

indicating superior symptomatic recovery with bromocriptine therapy.

Table III
NYHA functional class distribution at 6 months.

NYHA Class	Bromocriptine group (n=20), n (%)	Non-bromocriptine group (n=20), n (%)	p-value
Class I	12 (60)	7 (35)	0.02
Class II	6 (30)	8 (40)	0.35
Class III	2 (10)	4 (20)	0.41
Class IV	0 (0)	1 (5)	0.31

Clinical outcomes at 6 months
Table IV presents recovery of LV function (LVEF $\geq 50\%$) was significantly higher in the bromocriptine group compared to the non-bromocriptine group (70% vs 40%, $p = 0.04$). Conversely, persistent severe LV dysfunction (LVEF $< 40\%$) was more frequent in the non-bromocriptine group (25% vs 5%, $p = 0.04$). One death occurred in the non-bromocriptine group, whereas no mortality was observed in the bromocriptine group; however, this difference was not statistically significant.

Table IV
Clinical outcomes at 6 months.

Outcome	Bromocriptine group (n=20), n (%)	Non-bromocriptine group (n=20), n (%)	p-value
LVEF $\geq 50\%$ recovery	14 (70)	8 (40)	0.04
Partial recovery (40–49%)	5 (25)	7 (35)	0.48
No recovery ($< 40\%$)	1 (5)	5 (25)	0.04
Mortality	0 (0)	1 (5)	0.31

Adverse events
Table V demonstrates both groups demonstrated a low and comparable incidence of adverse events. Nausea and headache were slightly more frequent in the bromocriptine group (15% and 10%, respectively), while hypotension occurred at similar rates in both groups. No serious drug-related adverse events were observed in either group. These findings suggest that bromocriptine was generally well tolerated with an acceptable safety profile.

Table V
Adverse events.

Adverse events	Bromocriptine group (n=20), n (%)	Non-bromocriptine group (n=20), n (%)
Nausea	3 (15)	1 (5)
Headache	2 (10)	1 (5)
Hypotension	1 (5)	2 (10)
Serious adverse events	0 (0)	1 (5)

DISCUSSION

Baseline characteristics in our study exhibited strong comparability between groups, with no significant variations in age, primiparity, hypertension, diabetes, baseline LVEF, and NYHA class III–IV suggesting similar disease severity at the time of enrollment. This aligns with the EORP PPCM registry by van der Meer et al. (2025), which similarly noted comparable baseline age, parity, and LV function in both bromocriptine and non-bromocriptine groups, endorsing equal cohorts for outcome analysis [12].

In this current study, LVEF showed improvement in both groups, yet it was notably greater in the bromocriptine group at 1, 3, and 6 months. This is consistent with Attachaipanich et al. (2025), who observed improved LVEF recovery and greater normalization rates using bromocriptine in PPCM [13].

At 6 months, the bromocriptine group demonstrated superior functional recovery, exhibiting higher NYHA Class I rates and more significant advancement to NYHA I–II. This is consistent with Sliwa et al. (2010), which noted a more significant LVEF improvement ($\sim 20\text{--}25\%$ compared to $\sim 10\text{--}15\%$) and quicker clinical recovery

with bromocriptine in PPCM, reinforcing its positive impact on functional and cardiac results [14].

At 6 months, the bromocriptine group exhibited greater LVEF recovery $\geq 50\%$ and reduced persistent severe dysfunction, with no notable difference in mortality. These results align with the work of Arrigo et al. (2017), which stated that bromocriptine, integrated into the "BOARD" strategy, enhances left ventricular recovery and lowers the risk of severe dysfunction in peripartum cardiomyopathy when used alongside standard treatment [15].

Both groups experienced low, similar adverse events, with only mild symptoms and no severe drug-related issues, suggesting that bromocriptine is well tolerated. This is consistent with Badianyama et al. (2021), who indicated that bromocriptine is typically safe in PPCM, exhibiting mainly minor side effects and infrequent severe incidents when administered alongside standard treatment [16].

Overall, Bromocriptine, when combined with standard therapy in PPCM, showed enhanced LVEF recovery, superior functional outcomes, and a favorable safety

profile compared to standard therapy by itself.

CONCLUSION

This study demonstrates that the addition of bromocriptine to standard heart failure therapy in patients with peripartum cardiomyopathy is associated with significantly improved clinical and echocardiographic outcomes. Patients receiving bromocriptine showed a faster and greater improvement in left ventricular ejection fraction, better recovery of NYHA functional class, and a higher rate of complete ventricular recovery compared to those receiving standard therapy alone. The incidence of adverse events was low and comparable between groups, with no significant safety concerns identified. These findings suggest that bromocriptine may be an effective and well-tolerated adjunct therapy in improving short-term in-hospital and 6-month outcomes in peripartum cardiomyopathy. However, larger multicenter studies are recommended to further validate these results and establish long-term safety and efficacy.

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