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A RETROSPECTIVE AND PROSPECTIVE SINGLE CENTRE OBSERVATIONAL STUDY ON DILATED CARDIOMYOPATHY IN CHILDREN

Paediatric Medicine

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ABSTRACT

Background: Dilated cardiomyopathy (DCM) in children is a rare but severe condition with high mortality. This study aims to evaluate the survival rate, factors influencing survival, and echocardiographic changes during follow-up in pediatric DCM. **Methods:** An ambispective observational study was conducted over 6 years at Aster MIMS, Kozhikode, Kerala. Data were collected retrospectively for 5 years and prospectively for 1 year. Children under 14 years diagnosed with DCM based on echocardiographic findings were included. Survival rates at 6 months, 3 years, and 5 years were analyzed, and echocardiographic parameters such as ejection fraction (EF) and fractional shortening (FS) were assessed. **Results:** Out of 30 children, 60% were female, and 76.7% were below 1 year of age. The survival rates at 6 months, 3 years, and 5 years were 70%, 66.7%, and 63.3%, respectively. Most deaths occurred within 48 hours of presentation. High initial EF and FS were associated with better survival. Echocardiographic improvements were observed within the first 6 months, with normalization in long-term follow-up. **Conclusion:** Early diagnosis and intervention are crucial in pediatric DCM, particularly within the first 48 hours. Echocardiographic parameters serve as critical markers for prognosis. Long-term follow-up reveals potential recovery, though some children may continue to have dysfunction.

KEYWORDS

Dilated cardiomyopathy, Survival, Ejection fraction, Fractional shortening, Pediatric cardiology.

INTRODUCTION:

Dilated cardiomyopathy (DCM) is a rare yet serious condition in pediatric patients, characterized by ventricular dilation and systolic dysfunction. It carries significant morbidity and mortality, particularly in young children. Despite advancements in critical care, the prognosis remains guarded, especially in infants. This study aims to evaluate the clinical profile, survival predictors at presentation, and follow-up echocardiographic changes in children diagnosed with DCM in a tertiary care setting.

MATERIALS AND METHODS:

This was an ambispective observational study conducted over 6 years at Aster MIMS, Kozhikode, Kerala. Data was collected retrospectively for 5 years and prospectively for 1 year. Children aged less than 14 years with echocardiographic evidence of dilated cardiac chambers (LVEDD and LVESD Z-scores > 2) and systolic dysfunction (FS < 28% or EF < 55%) were included. Exclusion criteria comprised congenital structural heart disease, systolic dysfunction due to non-cardiomyopathic causes, and follow-up less than 6 months.

Data on demographic details, clinical findings, laboratory parameters, and echocardiographic measurements were obtained from electronic medical records. Statistical analysis was performed using STATA version 12. Survival analysis was done with Kaplan-Meier curves, and factors influencing survival were identified using chi-square tests and t-tests where appropriate.

RESULTS:

Out of the 30 children included, 60% were female, and 76.7% were below 1 year of age. A family history of DCM was observed in 6.7%. At presentation, 66.7% had cardiac failure and 50% presented with shock. The median cardiothoracic ratio was 64 ± 7.2%, the mean EF was 30.22%, and the median FS was 13%.

The survival rates at 6 months, 3 years, and 5 years were 70%, 66.7%, and 63.3%, respectively. Most deaths occurred within the first 48 hours. High initial EF and FS were significantly associated with better survival outcomes ($p < 0.05$). Echocardiographic parameters such as EF, FS, LVEDD, and LVESD showed improvement within 6 months but required long-term follow-up for normalization.

Tables And Figures:

Table 1: Comparison of Echocardiographic Measurements among Survival Groups

Parameter	Death (n=11)	Survived (n=19)	p-value
Ejection Fraction (%)	23.07 ± 7.80	34.37 ± 13.82	0.019
Fractional Shortening (%)	11.07 ± 2.19	15.68 ± 7.41	0.02
LVEDD Z Score	7.15 ± 5.55	4.71 ± 3.81	0.164
LVESD Z Score	8.06 ± 5.49	6.70 ± 4.69	0.476

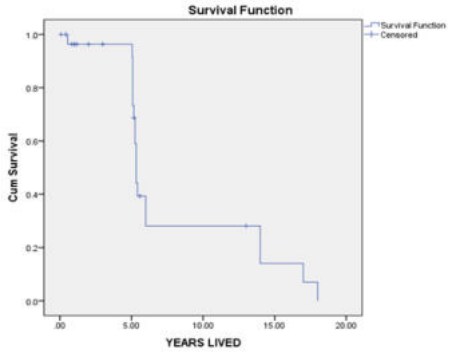

Figure 1: Kaplan-Meier Survival Curve for Study Population

DISCUSSION:

Our study found that pediatric patients with DCM have a high early mortality rate, particularly within the first 48 hours of admission. This highlights the critical need for rapid intervention during the initial phase of presentation. Key factors influencing survival included high initial EF and FS, which were predictive of better outcomes. These findings are consistent with previous studies that demonstrate the importance of baseline cardiac function as a prognostic marker.

Improvements in echocardiographic parameters were observed within the first 6 months, with normalization noted in long-term follow-up for survivors. However, these changes were not universal, and some patients continued to have suboptimal cardiac function. Early identification of poor prognostic indicators may help optimize management and improve outcomes.

CONCLUSION:

This study underscores the significance of early diagnosis and prompt intervention in pediatric DCM. Survival rates decline sharply within the first 48 hours, emphasizing the need for aggressive management during this critical window. High initial EF and FS are associated with better survival, suggesting their utility as prognostic markers. Long-term follow-up demonstrates the potential for echocardiographic recovery, although persistent dysfunction remains in some cases.

Further large-scale studies are warranted to validate these findings and establish standardized treatment protocols for pediatric DCM in resource-limited settings.

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