



# EFFECTIVENESS OF AMLODIPINE AGAINST MYOCARDIAL IRON OVERLOAD AMONG BETA-THALASSEMIA PATIENTS: A META-ANALYSIS

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## INTRODUCTION

- ❖ Thalassemia is one of the most common inherited disorders and more than 68,000 thalassemia patients are born annually and the incidence of the transfusion-dependent form exceeds 25,000 cases per year.
- ❖ The heart is one of major target organs of excess iron deposition in conditions of overload, predisposing one to serious and irreversible damage.
- ❖ Treatment of iron overload usually involves iron chelation, however this modality may not prevent uptake of iron in all organs, especially in those in which iron enters cells through specific ion channels such as the calcium channels in the cardiac cells.
- ❖ Amlodipine is a long-acting L-type calcium channel blocker that is taken only once daily without any dietary restrictions.

## OBJECTIVES

This meta-analysis aims to assess the effectiveness of using amlodipine as an adjunct to iron chelation therapy in the management of myocardial iron overload as compared to iron chelation therapy alone among pediatric patients with transfusion-dependent Beta Thalassemia.

## METHODS

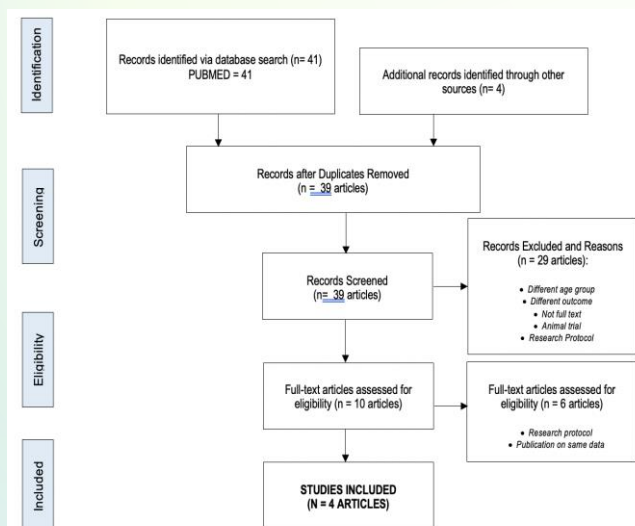


Figure 1. PRISMA Flow Diagram of Study Selection

- A total of 13 studies were acquired after an extensive search through different databases
- Four randomized controlled trials with a total of 142 patients were individually reviewed and examined by three researchers.
- All statistical analyses were conducted using STATA MP Statistical Software, Version 13.
- Standardized mean difference was utilized to estimate the pooled effect on cardiac T2\*, serum ferritin, and liver iron concentration values.
- Risk ratio was computed using the frequency or counts of patients with and without the adverse events (edema, hypotension, and palpitations).

## RESULTS

- **Primary outcome:**
  - At 6 months, the mean cardiac T2\* was not significantly different between the Amlodipine and control group (SMD=0.89, z=0.55, p=0.582, 95% CI =-2.29 to 4.08).
  - At 12 months, the Amlodipine group showed slight improvement compared to the control group (SMD=0.40, z=1.63, p=0.104, 95% CI =-0.08 to 0.89)
- **Secondary outcome:**
  - The analysis of the serum ferritin at 6 months between the Amlodipine and the control groups showed evidence that the serum ferritin was significantly different between the two groups (SMD=-1.32, z=2.48, p=0.013, 95% CI =-2.36 to -0.28)
  - Mean liver iron concentration at 6 months was significantly different between the two groups (SMD=-2.40, z=6.61, p=0.001, 95% CI = -3.11 to -1.69).

- Amlodipine-assisted iron chelation therapy groups were seen to show improvement of the primary outcome when compared to the sole iron chelation therapy groups.
- Although results of Cardiac T2\* have been positive in nature, several factors must still be investigated to conclude Amlodipine's effectivity for this specific function. It is worthy to note that the studies included had different CCB dosages, different chelation drugs and regimen.

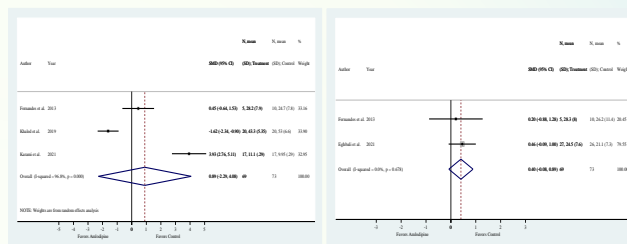


Figure 3. Meta-Analysis for the Pooled Effect on the Cardiac T2\* between the Intervention (Amlodipine) and Control Groups

## CONCLUSION

In synthesis, this meta-analysis has showcased how the calcium channel blocker amlodipine, in conjunction with standard iron chelation therapy, can prevent myocardial iron overload in transfusion-dependent Beta-Thalassemia pediatric patients. However, conclusive statements are yet to be made since there are a multitude of factors that should still be considered, especially given the limited number of studies that have been conducted as to date.

For further research, large scale studies are encouraged for a better representation of populations. Studies using different chelating agents and amlodipine dosages would also be of help in future studies. Investigation of other organ systems is also recommended, especially the endocrine system, since cardiac siderosis is closely associated with endocrine ailments.

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