

Editorial

Thalassemia Prevention in Bangladesh: From Clinical Burden to Public Health Imperative.

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Abstract

Thalassemia represents a significant public health challenge in Bangladesh. With a high carrier frequency and thousands of affected births annually, the disease imposes substantial clinical, economic and social burdens. While advances in transfusion support, iron chelation and hematopoietic stem cell transplantation (HSCT) have improved survival, prevention remains the most effective and sustainable strategy.

Introduction:

Thalassemia comprises a heterogeneous group of inherited hemoglobin disorders characterized by defective globin chain synthesis, leading to chronic anemia and ineffective erythropoiesis. In South and Southeast Asia, HbE/ β -thalassemia and β -thalassemia major are the predominant forms¹. Bangladesh, situated within the "thalassemia belt," carries a disproportionately high disease burden.

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Epidemiology in Bangladesh:

Recent national data suggest that approximately 11.4% (8.59%-Hb-E trait, 2.12%-Beta trait and 0.69% others type) of the Bangladeshi population are carriers of thalassemia traits², corresponding to nearly 20 million individuals. Each year, an estimated 11,000–12,000 children are born with clinically significant thalassemia, based on Hardy–Weinberg projections. The current patient population exceeds 500,000, with nearly 60% requiring regular transfusion support. The high prevalence is attributed to limited awareness, absence of structured screening programs, and sociocultural practices such as consanguineous marriage. Importantly, carriers remain asymptomatic, contributing to silent disease transmission.

Clinical Burden and Treatment Gaps:

Patients with transfusion-dependent thalassemia require lifelong red blood cell transfusions to maintain hemoglobin

levels. Repeated transfusions inevitably lead to iron overload, necessitating continuous iron chelation therapy. Without adequate management, complications such as cardiomyopathy, liver disease and endocrine dysfunction significantly increase morbidity and mortality³. Yet, in developing countries, only a small fraction of thalassemia patients (less than 10%) receives optimal care due to limitations in infrastructure, affordability, and access⁴. Hematopoietic stem cell transplantation (HSCT) remains the only curative option for thalassemia. Outcomes are most favorable in younger patients, with cure rates approaching 70–80% in appropriately selected cases⁵. However, access remains limited by cost, donor availability, and specialized facility requirements in our country. Importantly, several economic evaluations have demonstrated that HSCT, despite its higher upfront cost, is cost-effective over the long term when compared to lifelong transfusion and iron chelation therapy^{6–8}. These findings highlight HSCT as not only a clinically effective but also an economically rational intervention, particularly when performed early in life.

Prevention:

Given the lifelong burden of treatment, prevention remains the most effective strategy. When both parents are carriers, each pregnancy carries a 25% risk of producing an affected child and a 50% probability of a carrier offspring¹. Strategic Framework for National Prevention; a comprehensive national program should include:

- i. Population-based carrier screening
- ii. Premarital testing and counseling
- iii. Prenatal diagnosis (10–12 weeks gestation)
- iv. Genetic counseling services
- v. Public awareness campaigns
- vi. Integration into national education programs.

Countries such as Cyprus and Iran have demonstrated that systematic implementation of these strategies can reduce new thalassemia births by over 90%³.

Conclusion:

In Bangladesh Thalassemia is not merely a clinical issue. It is a pressing public health priority. Prevention, through

structured screening and informed reproductive choices, represents the most feasible and cost-effective solution. It demands collective responsibility from policymakers and healthcare providers to educators, community leaders and families. To prevent it, transforming awareness into action is the only way forward.

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