

## **Epidemiology and Disease Pathophysiology: Thalassaemia**

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The thalassaemias comprise a heterogeneous group of disorders of haemoglobin production in which normal haemoglobin production is partly or completely suppressed due to defective synthesis of one or more components of the globin chains. Depending on the genes involved, the defect is classified as  $\alpha$ -thalassaemia or  $\beta$ -thalassaemia. This presentation investigates the molecular basis, clinical manifestations, epidemiology, and current management of  $\beta$ -thalassaemia major (TM) and  $\beta$ -thalassaemia intermedia (TI). The two forms of  $\beta$ -thalassaemia have distinct features: TM presents typically within the first year of life, and patients subsequently require ongoing transfusions to survive. TI presents later in life, and patients may be transfusion independent or require only sporadic transfusions.

Approximately 7% of the world's population is affected by haemoglobin disorders, and between 300,000 and 500,000 infants are born each year with severe homozygous disease. Thalassaemias are distributed globally; in addition to the Mediterranean countries in which they were first recognized, thalassaemias are frequently found in Asia and the Far East. This worldwide spread of thalassaemia, with its morbidity and mortality, has been attributed to population migration. In fact, due to the continual migration of populations from one area to another, there is virtually no country in the world in which thalassaemia does not affect some percentage of the inhabitants. Complications of TM are mostly due to iron overload caused by frequent blood transfusions, and include heart failure, infection, hypogonadism and infertility, diabetes mellitus, and hypothyroidism. In contrast, TI complications include thrombosis, pulmonary hypertension, leg ulcers, extramedullary haematopoiesis, and endocrine disorders. Iron overload occurs in both types of thalassaemia, arising from frequent transfusions or excess GI absorption of iron. Chelation therapy is currently the gold

standard for therapy of iron overload, although bone marrow transplantation, HbF-inducing therapy, and gene therapy are under investigation.

### **Suggested Readings**

Cappellini N, Cohen A, Eleftheriou A, Piga A, Porter J, eds. *Guidelines for the Clinical Management of Thalassemia*. Nicosia, Cyprus: Thalassemia International Federation; 2000. Available at <http://www.thalassaemia.org.cy/Publications.htm>

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Porter JB. Practical management of iron overload. *Br J Haematol*. 2001;115:239-252.

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