Summary

Osteogenesis imperfecta (OI) is a heterogeneous group of inherited disorders of connective tissue characterized by bone fragility and other evidence of connective tissue malfunction. Affected individuals are susceptible to fractures from the mildest trauma, with the disease also known as 'brittle bone disease'.

Other major clinical signs are osteopenia, varying degrees of short stature, progressive skeletal deformities, blue sclerae, dentinogenesis imperfecta, joint laxity, and adult onset deafness

The disease caused by alterations in the metabolism of type I collagen. Mutations for the genes (COL1A1 and COL1A2) that encode for the 2 polypeptides (proα-1 and proα-2) of type 1 procollagen result in quantitative and/or qualitative alterations to type 1 collagen synthesis.

The most widely used classification of osteogenesis imperfecta is by Sillence (1979) who distinguished four clinical types. Recently, three additional types have been delineated of patients who had a clinical diagnosis of the disorder but who presented clearly distinct features

Diagnosis of osteogenesis imperfecta is chiefly suggested following the frequent occurrence of fractures and a family history of the fractures that constitute the most crippling complications of the disease.

A multidisciplinary team approach is essential for diagnosis, for communication with patient and parents, and to tailor treatment needs to the severity of the disease and the age of the patient.

The causal defect of the disease cannot be corrected with medical treatment and, currently, only symptomatic therapy is available.

Three types of treatment are available: non surgical management (physical therapy, rehabilitation, bracing and splinting), surgery (intramedullary rod positioning, spinal and basilar impression surgery), and drugs to increase the strength of bone and decrease the number of fractures

In recent years growth hormone (GH) and bisphosphonate agents have been used in OI therapy. GH is beneficial in patients with moderate forms of OI, showing a positive effect on bone turnover, bone mineral density and height velocity rate.

Bisphosphonates have proved beneficial in children with severe OI, increasing bone mineral density and reducing the fracture rate and pain with no adverse effects reported. These data require confirmation in double-blind controlled studies; however, bisphosphonates have markedly improved morbidity in patients with OI.

Future developments in genetic therapy may be directed towards either replacing cells carrying the mutant gene with normal cells or silencing the mutant allele using antisense suppression therapy, thus transforming a biochemically severe form of OI into a mild form.