Osteogenesis imperfecta, also known as “brittle bone disease” is a clinically and genetically heterogeneous group of autosomal dominant inherited disorders characterized by bone fragility and fractures. Its estimated prevalence is between 1:5000 and 1:20,000 live births with no racial or ethnic predilections ***(Huber, 2007)***.

Pathologic changes are seen in all tissues in which type I collagen is an important constituent; examples include bone, ligament, dentin, and sclera. The basic defect is one of a qualitative or quantitative reduction in type I collagen. Mutations in genes encoding type I collagen affect 1 of the 2 genes coding, accounting for about 80% of cases of osteogenesis imperfecta ***(Cole, 1997)***.

The so-called diagnostic triad of blue sclerae, dentinogenesis imperfecta, and generalized osteoporosis in a patient with multiple fractures or bowing of the long bones usually is used clinically.

There is no specific laboratory test for this disease. Multiple wormian bones around the base of the skull are a major finding only in the congenital type of osteogenesis imperfecta. Osteogenesis imperfecta congenita is characterized at birth by multiple fractures, bowing of the long bones, short extremities, and generalized osteoporosis ***(Canale, 2004)***.

The most widely used classification is that of Sillence. Clinically, four broad groups can be distinguished. Two groups are characterized by dominant inheritance of osseous fragility with further heterogenecity determined by the presence or absence of opalescent dentin in families.

A further two groups are characterized by autosomal recessive inheritance of severe or extreme bone fragility. An X-linked variety of osteogenesis imperfecta also seems likely and a number of unique variants have been reported. These clinically defined groups are likely to represent classes of molecular defects. ***(Sillence, 1981)***

Until recently, surgical correction of deformities, physiotherapy, and the use of orthotic support and devices to assist mobility (eg, wheelchairs) were the primary means of treatment for osteogenesis imperfecta. ***(Jones et al, 2002)***

Surgical treatment is a safe adjunct to the management of the child with osteogenesis imperfecta. Its objectives are to control fractures and correct deformities. It may significantly improve the functional status of the child . ***(Millar, 1981)***

The most successful surgical method of treating the deformities of osteogensis imperfecta is based on the work of Sofield and Millar. Who used the method of multiple osteotomies, realignment of fragments and medullary nail fixation for long bones ***(Sofield & Millar, 1959)***

Presently, pharmacologic therapies aimed at strengthening bone are available, which decrease the pain and fracture rate associated with this condition, and allow more appropriate rehabilitation programs that will hopefully result in a less marked failure to thrive in affected children. ***(Devogelaer & Coppin, 2006)***

Medical treatment with bisphosphonates can bring significant additional improvements. Benefits include decreased pain, lower fracture incidence, and better mobility. Among the various bisphosphonates, intravenous pamidronate has been studied in detail.

As the effect of bisphosphonates on the skeleton is largest during growth, it appears logical to start medical therapy of Osteogenesis imperfecta patients as early as possible. However, the optimal treatment regimen and the long-term consequences of pamidronate treatment in children are currently unknown.

Medical therapies other than bisphosphonates, such as growth hormone and parathyroid hormone, play a minor role at present ***(Rauch & Glorieux, 2005)***

Cell and gene therapies as potential treatments for osteogenesis imperfecta are therefore currently being actively investigated. The design of gene therapies for osteogenesis imperfecta is however complicated by the genetic heterogeneity of the disease and by the factor that most of the osteogenesis imperfecta mutations are dominant negative where the mutant allele product interferes with the function of the normal allele ***(Niyibizi et al, 2004)***