Origin of renal osteodystrophy and cardiovascular complications are multifactorial. This complications are caused by disorders of calcium – phosphate metabolism already at the beginning of patient´s irreversible renal failure. The factors playing the most important part in the development o renal ostedystrophy and are hypocalcemia and increasing serum phosphate levels associated with a declining glomerulal filtration. Two main types of renal osteodystrophy can be described - high turnover bone disease and low turnover disease. High turnover forms of renal osteodystrophy are characterized by rapid bone turnover caused by abnormally high PTH levels. The two types of high turnover renal osteodystrophy are predominant hyperparathyroid bone disease, and mixed uremic osteodystrophy. Low turnover forms of renal osteodystrophy are characterized by a dramatic drop in the rate of bone remodeling, caused by oversuppression of PTH and/or by aluminum accumulation. The bones become thin and overly flexible, and bowing may occur. The two types of low turnover renal osteodystrophy are low turnover uremic osteodystrophy and aluminum-related bone disease. Patients who have end-stage renal disease with increased serum phosphate levels and calciumphosphate products are associated with an increased prevalence of ectopic calcifications – cardiovascular and valves calcifications and an increased cardiovascular mortality rate.

Bone densitometry has become an important tool in the diagnosis and management of renal osteodystrophy. The most available methods include plain X-ray, dual energy X-ray absorptiometry (DXA) and quantitative computed tomography (QCT). QCT has the ability to measure selectively the trabecular compartment of the vertebrae and has therefore been recognized as the most sensitive method with which to assess BMD in patients with osteopenia. Calcium scoring (CAS) is playing an important role in screening for coronary artery calcification and also for valves calcifications detection. The result of CAS is Agatston score, it is an independent factor for increased cardiovascular mortality rate.

Our study was performed in a group of 72 hemodialysis patients. All patients underwent computed tomography examination of the bone mineral density and calcium scoring. Detected values of Z- score and CAS were correlated with levels of intact parathormone, calcium, phosphorus, calciumphosphate products , duration of hemodialysis, vitamin D treatment and history of diabetes mellitus. The results were prospectively compared after one year.

There was found statistically significant dependency of increased CAS (very high risc of cardiovascular mortality) and increased levels of phosphorus ($p = 0,01$) and increased calciumphosphorus product ($p = 0,004$). We have found an extensive increasing of CAS during one year ($p = 0,0001$). There was not found statistically significant dependency of bone mineral density on investigated laboratory parameters. These results we explain by multifactorial origin of renal osteodystrophy and by development of these changes in praedialysis.