Patients with Osteoarthritis (OA) at the age of 21 to 39 years and disease duration from 2 to 17 years. In 15 cases, it was preceded by the appearance of chronic rheumatism of the lower limbs (athletes), in 9 cases, it developed against the background of obesity 2–3 stage. All patients underwent clinical, radiological and densitometric study. DNA diagnostics were studied in blood leukocytes, which included a study of the insertion-deletion polymorphism of FDPS gene — method of polymerase chain reaction with using a diagnostic test systems SNP-Express ACE Alu Ins/Del (Liteh, Russia).

The control group included 50 practically healthy persons of similar age and sex.

Results. The study showed that in 9 cases OA changes at densitometric study has not been identified; 11 patients (34.4 %) were diagnosed with osteopenia and 12 (37.5 %) — osteoporosis of different severity. In the study of polymorphism of FDPS gene was found that in patients with normal densitometry genotype A/A was found in 5 cases (55.6 %), genotype A/C was identified in 3 patients (33.3 %) and pathological C/C genotype in 1 (11.1 %). In the group of patients with osteopenia and OA — normal genotype was found in 2 cases (18.2 %); genotype A/C in 6 patients (54.5 %) and pathological genotype (C/C) of the FDPS gene in 3 patients (27.3 %). In the group of patients with OP has increased frequency of pathological mutations (C/C genotype) to 66.7 % (8 patients); and genotype A/C was set at 4 patients (33.3 %). In studying of the prevalence of the FDPS gene of the healthy patients were received the following results: A/A genotype was recorded in 68 % (34 patients), A/C — in 24 % (12) and C/C — 8 % (4 patients).

Thus, patients with OA and osteopenia in 3.4 times frequently were recorded pathological mutation of FDPS gene in comparison with those of the control group. In patients with OA and osteoporosis this indicator was in 8.3 times higher.

Conclusion. In young patients with OA often determined violation of the structure of bone tissue, leading to the formation of osteopenia (11 patients — 34.4 %) or osteoporosis (12 — 37.5 %). Development of such changes in bone tissue occurs against pathological mutation of the FDPS gene (genotype C/C).

Thus, the study variants of the FDPS gene in patients with OA can be used as a marker for the formation of osteoporosis, which allows to develop measures for its prevention.