Chondrocyte expression of apoptotic and proinflammatory factors in the development of posttraumatic arthritis in humans

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The development of post-traumatic arthritis following intra-articular fracture remains an important unsolved clinical problem. The possibility that extensive chondrocyte apoptosis occurs following intra-articular fracture, thus contributing to the development of post-traumatic arthritis, has received increasing attention [1]. It has been demonstrated the existence of a direct correlation between the rate of apoptosis and the severity of osteoarthritis [2]. Pharmacologic inhibitors of enzymes involved in apoptosis have been explored as potential therapeutic agents [3]. In the present study we aimed to deepen the characterization of apoptotic mediators, expressed by chondrocytes, involved in human post-traumatic arthritis following intra-articular fracture and the possible implication of pro-inflammatory receptors in arthritis. The expression of a panel of pro/anti apoptotic factors (Caspase-3, PARP-1, BCL2) and inflammationrelated receptors (ChemR23) were analysed in chondrocytes from patients undergoing surgery for intra-articular calcaneal fractures. The factors were investigated by immunofluorescence coupled with confocal analysis and western blotting, followed by densitometric evaluation of chondrocyte cultures harvested from patients with intraarticular fractures compared with control ones. The results clearly demonstrated that a statistically significant difference exists in the expression of pro/anti apoptotic factors and ChemR23 between fractured and control patients. In conclusion our data suggest that increased chondrocyte death, occurring after cartilage injury together with inflammatory process, could play a pivotal role in the onset of arthritic disease.

References

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Articular fracture, post-traumatic arthritis, chondrocyte culture, apoptosis, inflammation.