Comprehensive assessment of risk factors and constant load monitoring prevent overuse injuries of extensor mechanism in elite volleyball players

Background Overuse injuries of extensor apparatus are common and debilitating in elite volleyball. Addressing the internal risk factors and monitoring the training load are key for injury prevention.

Objective To highlight the effectiveness of preventive measures on an elite male volleyball team in 2 consecutive seasons.


Setting Male volleyball team competing in elite division.

Participants The players of Halkbank Volleyball Team during the 2019–2020 and 2020–2021 seasons.

Assessment of Risk Factors Functional movement system test and Y-balance test were conducted and 1-RMs were assessed after pre-participation evaluation. Linear periodization was used during the pre-season preparation period. Individual strength-mobility deficits and asymmetries of players were targeted with supervised exercise sessions in addition to regular fitness trainings. The players’ total load on extensor apparatus during trainings and games were monitored with the G-Vert, a commercially available wearable device measuring vertical displacement and jump count. The target values as maximum tolerable jump counts were established for each position and for each player who had previous extensor apparatus injury. The training volume was adjusted when the target value is achieved.

Main Outcome Measures The primary study outcome measure was the time loss due to extensor mechanism injuries.

Results A comprehensive approach to prevent overuse injuries of the extensor mechanism yielded excellent results in an elite division volleyball team. There was no time loss due to overuse injuries of extensor apparatus despite the heavy training and the game load.

Conclusions Reducing and monitoring the internal risk factors combined with constant monitoring and establishment of a target jump load in volleyball prove to be useful. Considering the technical difficulties to conduct a high-quality randomized research on elite athletes, comprehensive preventive measures applied for two years show promising results.