Mechanisms for Anterior Cruciate Ligament Injury in World Cup Alpine Skiing: A Systematic Video Analysis of 20 Cases

Abstract: Background: There is limited insight into the mechanisms of anterior cruciate ligament injuries in alpine skiing, particularly among professional ski racers. Purpose: This study was undertaken to qualitatively describe the mechanisms of anterior cruciate ligament injury in World Cup alpine skiing. Study Design: Case series; Level of evidence, 4. Methods: Twenty cases of anterior cruciate ligament injuries reported through the International Ski Federation Injury Surveillance System for 3 consecutive World Cup seasons (2006-2009) were obtained on video. Seven international experts in the field of skiing biomechanics and sports medicine related to alpine skiing performed visual analyses of each case to describe the injury mechanisms in detail (skiing situation, skier behavior, biomechanical characteristics). Results: Three main categories of injury mechanisms were identified: slip-catch, landing back-weighted, and dynamic snowplow. The slip-catch mechanism accounted for half of the cases.