Patient Predictors of Early Revision Surgery after Anterior Cruciate Ligament Reconstruction: A Cohort Study of 16,930 Patients with 2-Year Follow-Up

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**Background:** Anterior cruciate ligament rupture is a common and handicapping sports injury, commonly treated with reconstruction. Revision surgery is an effective endpoint to investigate outcome after primary anterior cruciate ligament reconstruction.

**Purpose:** To investigate if activity at index anterior cruciate ligament rupture, age at surgery, sex, body height, body weight, body mass index, smoking and use of smokeless tobacco are predictors for early revision surgery.

**Study design:** Prospective cohort study. Level of evidence, 2.

**Method:** Data from the Swedish National Knee Ligament Register was extracted for analysis. Patients with primary anterior cruciate ligament reconstruction were followed for two years, or until revision surgery. Abovementioned patient variables were selected for analysis. Inclusion criteria were: Anterior cruciate ligament reconstruction between 2005 and 2011, patient age 13-59, hamstring tendon autograft or patellar tendon autograft, no contralateral anterior cruciate ligament reconstructions or previous anterior cruciate ligament surgeries and no concomitant fractures or ligament injuries. Stratified relative risk regression model was used for calculating relative risk, and multivariate analysis was adjusted for possible confounding factors.
**Results:** 16,930 patients were included, 7,163 were female. Crude revision rate was 1.82%, with 308 revisions. Soccer and age 13-19 significantly increased risk of revision surgery. Combining these factors further increased risk (males: RR 2.87 [95% CI 1.79-4.60], females: RR 2.59 [95% CI 1.69-3.96]). Male downhill skiing and age above 30 were significant predictors for decreased risk. Height, weight, body mass index, smoking, tobacco and sex were not significant predictors.

**Conclusions:** Soccer and adolescence were significant risk factors for early revision surgery, and combining these factors further increased risk. There was no significant sex difference in risk of revision, in spite of female sex being a risk factor for primary anterior cruciate ligament rupture. Height, weight, body mass index and tobacco were not significant predictors.