Research Study

EXCERPT FROM

Strength Imbalances and Prevention of Hamstring Injury in Professional Football Players

Experimental Procedure:

Preseason isokinetic measurements were performed on hamstring and quadricep muscles. The protocol modalities were inspired from a previous study dedicated to hamstring strain. Measurements were preceded by a warm-up consisting of pedaling on an ergometric bicycle (75 to 100 watts) and performing stretching exercises of the hamstring and quadricep muscles. The range of knee motion was fixed at 100° of flexion from the active maximum extension.

TABLE 2
Hamstring Injury Frequency in Professional Football Players

Group	Players, n (n = 462)	Injuries, n (n = 35)	Injury Frequency, %
A[a]	246	10	4.1
B[b]	91	15	16.5
C[c]	55	6	11
D[d]	70	4	5.7

Editors Note:
[a]Group A had no preseason strength imbalance.
[b]Group B had preseason strength imbalances but no subsequent specific compensating training.
[c]Group C had preseason strength imbalances and subsequent compensating training, but no isokinetic control test aimed at verifying the parameter normalization.
[d]Group D had preseason strength imbalances and a subsequent compensating training until the parameter normalization was proved by repeated isokinetic control tests.

The analysis of results included the absolute peak torque in Newton meters, and the bilateral comparison led to the determination of asymmetries expressed in percentage form.

Editors Note: The investigators used 3 criteria to determine hamstring muscular imbalance

1. *Standard concentric / concentric @ 60 and 240 deg / sec*
2. *Eccentric / concentric hamstring @ 30 or 120 deg / sec*
3. *Concentric quads and eccentric hamstring contractions @ 60 and 240 deg / sec*

respectively. If there was an imbalance in 2 of these testing conditions, the subject was allocated to the hamstring imbalance group. This imbalance group was then split; the intervention group and the non-intervention group. After entering the intervention group, no specific training protocol was implemented other than, it addressed the hamstrings.

Results: Of 687 players isokinetically tested in preseason, a complete follow-up was obtained in 462 players, for whom 35 hamstring injuries were recorded. The rate of muscle injury was significantly increased in subjects with untreated strength imbalances in comparison with players showing no imbalance in preseason (relative risk = 4.66; 95% confidence interval: 2.01-10.8). The risk of injury remained significantly higher in players with strength imbalances who had subsequent compensating training but no final isokinetic control test than in players without imbalances (relative risk = 2.89; 95% confidence interval: 1.00-8.32). Conversely, normalizing the isokinetic parameters reduced the risk factor for injury to that observed in players without imbalances (relative risk = 1.43; 95% confidence interval: 0.44-4.71).

The American Journal of Sports Medicine, Vol. X, No. X DOI: 10.1177/0363546508316764