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New Research Shows Chiropractic Helps Prevent Leg Injuries

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The following is excerpted with permission from the May 2010 issue of The Chiropractic Report.

Hamstring injuries are among the most common and costly sports injuries. Conventional injury prevention has focused on local factors such as poor flexibility of the hamstring muscles, fatigue and lack of warm-up, rather than non-local factors typically addressed under chiropractic care—such as the biomechanics and postural control mechanisms of the lumbar spine and pelvis. However, evidence supporting both local and nonlocal factors has been lacking.

Therefore, the importance of a new randomized controlled trial (RCT) by Australian chiropractic researchers Wayne Hoskins, DC, PhD, and Henry Pollard, DC, PhD, published in *BMC Musculoskeletal Disorders*. For the 2005 season for 60 players from two Australian Rules football teams, normal best sports medicine care was compared with the same care plus chiropractic management.

Background and Goals

Hoskins and Pollard are from the Macquarie Injury Management Group, Department of Chiropractic, Faculty of Science, Macquarie University, Sydney, Australia. Hoskins' postgraduate studies and research have focused on the prevention and management of hamstring injuries. He had to temporarily relocate from Sydney to Melbourne for the trial, for which he was the treating clinician. Pollard, who is Director of Research at the Department of Chiropractic, Macquarie University, also serves as Chair of the Research Commission of the Federation Internationale du Sport de Chiropractique (FICS—www.fics-sport.org) the international organization representing the specialty of sports chiropractic.

They were aware that hamstring injuries are a major problem for the Australian Football League (AFL) and its players, that there were very few well-designed studies on injury prevention, and that there were none on chiropractic preventive care. As a result they designed an RCT with the following objective: “to investigate whether a sports chiropractic intervention consisting of pragmatically and individually determined high-velocity, low-amplitude (HVLA) manipulation, mobilization and/or supporting soft-tissue therapies to the spine, pelvis and extremity could reduce local and non-local hamstring injury risk factors to prevent the occurrence of hamstring and other non-contact lower limb injuries in semi-elite Australian Rules footballers.”

To set up the trial they applied to the AFL Research Board for funding. As a prerequisite they needed the support of one of the AFL's 16 clubs. Notwithstanding that no club employed a chiropractor on its medical staff, 5 clubs agreed to support the project. They would help with recruitment of players/subjects from their feeder clubs.

In fact no funding was given by the AFL Research Board. Four clubs with semi-elite players based in Melbourne in the Victorian Football League (VFL) agreed to participate, with consent from management, coaching and medical staff. This would have given the planned 120 players/subjects for the trial to have the desired numbers and statistical power. Because of changed medical staff, 2 clubs pulled their support at a late stage. As a result the trial proceeded with 2 clubs and 60 subjects—30 for each of the treatment and control groups.

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Inclusion/Exclusion Criteria

Players were eligible for the trial if they were listed players in their club's VFL squad and did not have 'red flag' conditions (e.g., fractures or destructive spinal lesions) or 'yellow flags' (e.g., litigation, insurance claims) or "severe history of chronic hamstring problems."

Intervention

For the 2005 playing season a final number of 59 players were randomly assigned in equal numbers to either a:

a. Control group. They received what was considered best medical and sports science management as directed by club medical staff including medication, manipulative physiotherapy, massage, strength and conditioning and rehabilitation exercises. There was no limitation in the number or type of treatments and no influence from the study authors. This was the usual care they would have been receiving if there had been no research project.

b. Intervention group. They received the same best management as the control group, but in addition pragmatic chiropractic treatment from a single experienced clinician. Features of the chiropractic management included:

- Treatment as determined appropriate on an individual patient/subject basis.
- One or more of joint manipulation (HVLA—high-velocity, low amplitude), joint mobilization (passive movement without thrust and within normal range of motion) and soft-tissue therapies.
- Directed to the spine, pelvis and extremity
- Minimum duration and frequency of treatment of 1 treatment per week for 6 weeks (Phase 1—the late pre-season period where pre-season matches were played) followed by one treatment per fortnight [two weeks] for 3 months—the remainder of the season (Phase 2).
- The average number of treatments was 17 per player. All players received manipulation and/or mobilization—92% received manipulation.

On the average treatment visit, manipulation and/or mobilization was directed at 4 of the 5 treatment areas—thoracic spine, knee, hip, lumbar spine and sacroiliac joint. However, overall the slight majority of treatments (53%) was soft-tissue techniques—principally to the gluteal region and lumbar spine, but also to the hip flexors, knee and posterior thigh.

Overall treatment was predominately directed at areas non-local to the hamstrings.

Outcome Measures

The primary outcome measure adopted was the one used in the AFL Injury Surveillance System, "currently considered the most reliable ... method in team sports." That is the number of games missed due to injury. The injuries monitored in this study were hamstring, other lower limb muscle and non-contact knee injuries. The definition of injury, again using the AFL method, was "any physical or medical condition that prevents a player from participating in a regular season (home and away) or finals match."

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Injury diagnoses were determined by club medical staff who were blinded to group allocation and therefore treatment being given. Staff used either clinical features of injury, advanced imaging or both at their discretion. The club medical and coaching staff independently determined this—there was no interference from the study authors.

Secondary outcome measures were the short form McGill Pain Questionnaire (MPQ-SF) for low back pain and the 39-item Health Status Questionnaire (SF-39). Players completed these prior to randomization into the trial and at the midpoint of the season—after 18 weeks of intervention and 12 home and away season matches.

Finally there was surveillance for adverse outcomes from the treatment being studied, mainly injury defined as “any undue pain, discomfort or disability arising during, immediately after or subsequent to chiropractic therapy that resulted in missed participation in a match or training session” or required additional medical care.

Results

There were no baseline or starting differences between players in the intervention and control groups for age and hamstring and knee injury history—important because these are the main risk factors for new injury. Results were:

a. Lower Limb Muscle Strain. Those in the intervention group and receiving chiropractic care had a statistically significant reduced risk of injury—injury rates were 3.6% in the intervention group and 27.6% in the control group. This had a large impact on missed matches. There were only 4 missed matches for lower limb muscle strain for the 28 players in the intervention group who completed the trial, 21 missed matches for the 29 in the control group.

b. Hamstring Injuries. There was a similar trend, but this did not reach the level of statistical significance. The incidence of injury in the intervention group was again 3.6% with 4 matches missed, compared with 17.2% in the control group with 14 matches missed.

c. Non-Contact Knee Injury. Incidence of injury in the intervention group was 3.6%, in the control group 24.1%. There was a statistically significant difference in the number of matches missed—1 in the intervention group, 24 in the control group.

d. Adverse Reactions. No player reported an adverse reaction to the intervention/chiropractic care.

e. Low-Back Pain. On the McGill Pain Questionnaire at baseline and at midpoint of the season there was a statistically significant reduction in overall and current back pain in the intervention group and current back pain in the intervention group but not the control group.

f. Health Status. At the mid season on the SF-39 health status questionnaire there was statistically significant improvement on various measures only for those in the intervention group—on the measures of bodily pain, role limitations due to physical health, general health and physical summary score.

Hoskins and Pollard emphasize that most of the chiropractic treatment was not directed to the hamstring areas, and that the results suggest that a variety of non-local factors amenable to multidisciplinary management appear to contribute to hamstring and other lower limb injuries. Their findings, they conclude “are important due to their potential for injury reduction, performance benefit and cost-saving practices for a relatively low-cost intervention.

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Summary

The authors suggest that the most significant difference between treatment offered to the intervention and control groups was the quantity and range of HVLA manipulation. The physiotherapy manual therapy ... will principally have been joint mobilization and soft-tissue therapy.

A major impact of the HVLA manipulation is likely improved neuromuscular control of the lumbopelvic region, creating improved function of the hamstrings—changes to existing length-tension and force-velocity relationships of the hamstrings that provide risk of injury.

There is much greater use of chiropractors in professional football in the U.S. Currently all 32 teams in the National Football League (NFL) have team chiropractors who belong to the Professional Football Chiropractic Society (www.profootballchiros.com). Hall of Famer Jerry Rice is a national spokesperson for the profession. Internationally many elite football clubs, such as Chelsea in the UK and AC Milan in Italy, now have team chiropractors. Skiers and skaters at the Winter Olympics, and sprinters and gymnasts at the Summer Olympics are attended by chiropractors.

When sprinter Donovan Bailey won the 100 meters in world record time at the Atlanta Olympic Games his first comment in the post race television interview was one of thanks to his chiropractor for keeping him injury free. However the road to even greater awareness and acceptance of the contributions chiropractic care can make must be paved with good quality research—congratulations to Hoskins and Pollard for their fine and continuing contribution.

David Chapman-Smith is Secretary General of the World Federation of Chiropractic and Editor of *The Chiropractic Report*.