

An ounce of prevention?

L Engebretsen, R Bahr

Justification is provided for the need to focus on research into sports injury prevention

The First World Congress on Sports Injury Prevention is taking place in Oslo, Norway 23–25 June 2005. At a time when there is an abundance of medical meetings, journals, and papers, some might argue that the last thing we need is a new congress focusing on yet another field of research. What would justify such an emphasis on a new and developing research field in medicine?¹ Firstly, it must ask important questions not answered by others. Secondly, the new research field should have the potential to create truly new knowledge, lead to new ways of thinking, and lay the foundation for improved health for our patients. This is usually not possible without a multidisciplinary approach, involving a mixture of basic scientists and clinicians. Thirdly, research results from the new field should be publishable in respected journals, recognised and cited by peers, presentable at high quality meetings, and fundable on competitive grant review.¹

Let us examine each of these issues to see if there is sufficient merit in research into sports injury prevention. Firstly, is injury prevention important? Epidemiological studies show that, of injuries seen by a doctor in Scandinavia, every sixth is sustained during sporting activity.² Among children, every third hospital-treated injury is the result of sports participation.² A research group within the English Football Association found that the overall risk to professional athletes is unacceptably high: about 1000 times higher among professional footballers than for high risk industrial occupations.³ Some injury types, such as serious knee injuries, are a particular cause for concern. The highest incidence of anterior cruciate ligament injuries is seen in 15–25 year old athletes in pivoting sports such as football, basketball, and handball, and the incidence is three to five times higher among women than men.⁴ Anterior cruciate ligament injury can result in long absence from work and sports, and dramatically increases the risk of long term sequelae such as abnormal joint dynamics and early onset of degenerative joint disease.⁵ Although a massive research effort is

ongoing to develop better treatment methods, we still lack evidence to suggest that reconstructive surgery of either menisci or cruciate ligaments decreases the rate of post-traumatic osteoarthritis.⁶ After 10 years, about half of the patients display signs of osteoarthritis, and it appears that nearly all patients will have osteoarthritis after 15–20 years.⁶ Thus, whereas developing improved treatment methods for injuries in general, and anterior cruciate ligament injuries in particular, remains an important goal, it may be even more important to prevent injuries.

The second issue relates to the potential for new ideas and improved health. When we started the Oslo Sports Trauma Research Center in May 2000, a PubMed search revealed that out of 10 691 papers on athletic injury, there were only six randomised controlled trials on sports injury prevention (table 1). However, a similar search of the literature now reveals that research on sports injury prevention is emerging as a new field in medicine. Whereas the number of papers on athletic injuries has increased by 25% over the last five years, clinical studies and randomised controlled trials related to sports injury prevention have doubled (table 1). Gradually, congresses in sports medicine, orthopaedics, and traumatology are including an increasing number of symposia, lectures, and instructional courses on injury prevention issues. Research quality is also improving. For example, recent issues of the *BMJ* have included two papers on injury

prevention: a case-control study⁷ among skiers and snowboarders indicating a 29% reduction in the risk of head injury, and a randomised controlled trial⁸ showing a 47% reduction in knee and ankle injuries from a structured programme of warm up exercises in adolescent team handball players. The publication of these studies in a highly respected journal illustrates that sports injury prevention is an important public health issue.

Sports participation is also important from a public health perspective. There is no longer any doubt that regular physical activity reduces the risk of premature death in general, and of coronary heart disease, hypertension, colon cancer, obesity, and diabetes mellitus in particular.⁹ The question is whether the health benefits of sports participation outweigh the risk of injury and long term disability, especially in high level athletes? Sarna *et al*¹⁰ have studied the incidence of chronic disease and life expectancy of former male world class athletes from Finland in endurance sports, power sports, and team sports. The overall life expectancy was longer in the high level athlete than a reference group (75.6 v 69.9 years). The same group also showed that the rate of hospital admission was lower for endurance sports and power sports than for the reference group.¹¹ This resulted from a lower rate of hospital care for heart disease, respiratory disease, and cancer. However, the athletes were more likely to have been admitted to hospital for musculoskeletal disorders. A follow up study showed that former team sport athletes had a higher risk of gonarthrosis.¹² Swedish studies also document an increased risk of hip and knee arthrosis among former footballers.¹³ Thus the evidence suggests that, although sports participation is beneficial, injuries are a significant side effect. To promote physical activity effectively, we have to deal professionally with the health problems of the active patient. This does not only involve providing effective care for the injured patient, but also actively

Table 1 Results of PubMed searches performed in May 2000 and February 2005 on sports injury research related to prevention and treatment

Search terms	May 2000	February 2005	Increase (%)
Athletic injury	10691	13358	25
& Treatment	6606	8525	29
& Limit: clinical trials	182	258	41
& Limit: RCTs	87	130	50
& Prevention	2064	2745	33
& Limit: clinical trials	29	68	135
& Limit: RCTs	21	41	95

The results are shown as the number of items resulting from the search terms shown. RCT, Randomised controlled trial.

developing and promoting injury prevention measures.

Therefore the Oslo Sports Trauma Research Center was established in May 2000 at the Norwegian University of Sport & Physical Education in Oslo with one main objective: to prevent injuries in sports through a long term multidisciplinary research programme focusing on injury prevention in sports. This is also what prompted us to organise an international congress focusing on this new and emerging field of medicine. During three busy days, 76 invited speakers from around the world will share their ideas and experiences with sports injury prevention. Sports specific as well as injury specific injury prevention programmes will be presented. Hands on workshops on how to deliver effective programmes securing good compliance will be tailored towards team medical staff. More than 150 abstracts focusing on current research from 30 countries will add to the programme as well.

In an evolving field such as this, international cooperation is critical. The involvement of the *British Journal of Sports Medicine*, which highlights research on sports injury prevention in this themed issue, will secure the dissemination of information around the

world. Since the beginning, this initiative has been supported by all of the major sports and sports medicine organisations, which bodes well for the future. It is hoped that the First World Congress on Sports Injury Prevention will represent a beginning, and that future meetings will follow and bring together researchers and practitioners, resulting in safer sports.

Br J Sports Med 2005;**39**:312–313.
doi: 10.1136/bjism.2005.018333

Authors' affiliations

L Engebretsen, R Bahr, Oslo Sports Trauma Research Center, Department of Sports Medicine, Norwegian University of Sport & Physical Education, Oslo, Norway

Correspondence to: Dr Engebretsen, Orthopaedic Center, Ullevaal University Hospital, Oslo, Norway; Lars.engebretsen@ioks.uio.no

Accepted 20 February 2005

Competing interests: none declared

REFERENCES

- 1 **Kahn CR**. Picking a research problem. The critical decision. *N Engl J Med* 1994;**330**:1530–3.
- 2 **Bahr R**, van Mechelen W, Kannus P. Prevention of sports injuries. In: Kjær M, Krogsgaard M, Magnusson P, et al. *Textbook of sports medicine. Basic science and clinical aspects of sports injury*

and physical activity. Oxford: Blackwell Science, 2002:299–314.

- 3 **Drawer S**, Fuller CW. Evaluating the level of injury in English professional football using a risk based assessment process. *Br J Sports Med* 2002;**36**:446–51.
- 4 **Myklebust G**, Mæhlum S, Holm I, et al. A prospective cohort study of anterior cruciate ligament injuries in Norwegian team handball. *Scand J Med Sci Sports* 1998;**8**:149–53.
- 5 **Roos EM**. Joint injury causes knee osteoarthritis in young adults. *Curr Opin Rheumatol* 2005;**17**:195–200.
- 6 **Myklebust G**, Bahr R. Return to play guidelines after anterior cruciate ligament surgery. *Br J Sports Med* 2005;**39**:127–31.
- 7 **Hagel BE**, Pless IB, Goulet C, et al. Effectiveness of helmets in skiers and snowboarders: case-control and case crossover study. *BMJ*. 2005 Feb 5;330(7486): 281, Epub 2005 Jan 4. Erratum in *BMJ* 2005 Feb 12;330, (7487):345.
- 8 **Olsen OE**, Myklebust G, Engebretsen L, et al. Exercises to prevent lower limb injuries in youth sports: cluster randomised controlled trial. *BMJ*. 2005 Feb 26;330: 449, Epub 2005 Feb 7., (7489).
- 9 **US Department of Health and Human Services**. *Physical activity and health: a report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, 1996.
- 10 **Sarna S**, Sahi T, Koskenvuo M, et al. Increased life expectancy of world class athletes. *Med Sci Sports Exerc* 2000;**25**:37–44.
- 11 **Kujala UM**, Sarna S, Kaprio J, et al. Hospital care in later life among world class athletes. *JAMA* 1996;**276**:216–20.
- 12 **Kujala UM**, Kettunen J, Paananen H, et al. Knee osteoarthritis in former runners, soccer players, weight lifters, and shooters. *Arthritis Rheum* 1995;**38**:539–46.
- 13 **Roos H**. Are there long-term sequelae from soccer? *Clin Sports Med* 1998;**17**:819–31.