Ball rolling on research into heading injuries

Heather Kent

Does repeated heading of a soccer ball cause brain damage? That controversial question is beginning to attract attention, in part because of soccer's growing popularity in North America. For the last few years, soccer has outpaced hockey as Canada's fastest-growing children's team sport; it is also the fastest-growing children's sport in the US, in large part because of the World Cup won by the US women's team last summer.

"There was no worry about this issue as long as soccer was being played by professionals in Europe," explains Dr. Benjamin Kibler, an orthopedic surgeon in Kentucky who is helping to prepare a position paper on the safety of heading. It will be released by the US Soccer Federation this fall.

When Kibler and his colleagues reviewed available research about 6 years ago, he could not make a recommendation for or against heading because the findings were inconclusive. Recent studies, including one published in *JAMA* in September 1999,[1] have also been criticized for their limitations, such as the small numbers of athletes tested. (*JAMA*'s cross-sectional study of 33 amateur soccer players and 27 amateur athletes involved in swimming and track found that "participation in amateur soccer in general and concussion specifically is associated with impaired performance in memory and planning functions."

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Nicholas Kent, 12, shows the recommended technique for heading a soccer ball.

Kibler, who has coached soccer for 15 years, isn't convinced. He is "a lot more concerned" about head injuries caused by children hitting the ground during play than by heading the ball. "That issue, as far as I know, is not being addressed in any studies."

Kibler attributes most heading injuries to poor technique, with too many players waiting for the ball rather than running to it and using the body's momentum to lessen the ball's kinetic energy. "It's strictly a physics problem," he says. Kibler agrees with other experts that lighter balls, at least for children's games, would help.

The Canadian Soccer Association (CSA) is currently preparing a position paper on heading. Dr. Rudy Gittens, chair of the CSA's Sports Medicine Committee, says heading the ball does not cause concussions, but if the player who heads it has already had a concussion, "heading the ball has the potential for exacerbating the injury. There is a definite need for controlled, sizable studies, and we need to look at the definition of concussion."

Dr. Christopher Honey, a Vancouver neurosurgeon and longtime soccer player, welcomes increased awareness of concussion in soccer. "People don't know that you can be awake and concussed with a grade 1 concussion," says Honey, whose children play soccer. He has treated patients who received head injuries while skiing and playing hockey, but none injured while playing soccer. "There are far more significant risks in other sports than heading in soccer."

But Dr. Paul Bratty, a Vancouver neurologist, is more cautious, and thinks that concussion from heading is a possibility. He suggests that the technique should be avoided until players are teenagers.

Dr. Lyle Micheli, a sports medicine specialist at the Children's Hospital in Boston, who has published research on soccer injuries and worked with the US Soccer Federation, doesn't discount the recent studies. He says most of them show that there may be cause for concern. "We have to be prepared to look at these more closely. Soccer is a game that's at risk for head injury. They [soccer authorities] have to change focus a bit."

Micheli agrees that ball size, technique and the age at which children begin heading are important factors, but he says that adequate education of coaches about issues related to concussion is "the burning issue in all youth sports."

The US has no standards in place for medical coverage at games or certification of coaches. Micheli is participating in a new coaching safety course in conjunction with the US Olympic Committee and the US Red Cross. "I would like coaches to be able to do a good fieldside assessment. If kids are complaining of being dazed and have any possible disorientation, that's a concussion and they should be out of the game."

Heather Kent is a Vancouver journalist.

Reference

1. Matser EJ, Kessels AG, Lezak MD, Jordan BD, Troost J. Neuropsychological impairment in amateur soccer players. *JAMA* 1999;282(10):971-3.