

Girls' Soccer Second to Football for Concussions

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DENVER – High school girls have twice the concussion rate of boys playing similar sports, according to an 11-year study conducted in a large public school district.

Not surprisingly, football accounted for the most concussions among participants in the six boys' and six girls' sports examined in the long-term study. But the sport with the second-highest concussion rate was girls' soccer, classified as an incidental contact sport rather than a collision sport, Andrew E. Lincoln, Sc.D., said at the meeting.

He presented a retrospective study of all concussions occurring in athletes participating in 12 sports at 25 high schools in Fairfax County, Va., during 1997-2008.

VITALS

Major Finding: Football had a concussion incidence of 0.6 cases per 1,000 athletic games or practices. The sport with the second highest incidence was girls' soccer, at 0.35 per 1,000 athletic exposures.

Data Source: A retrospective analysis of all 2,479 observed concussions during nearly 11 million athletic games or practices in 12 sports at 25 high schools in Fairfax County, Va., during 1997-2008.

Disclosures: The study was financially supported by the U.S. Lacrosse Sports Science and Safety Committee. Dr. Lincoln declared having no relevant financial interests.

This suburban Washington school district was the ideal location for such a study because as a matter of district policy a certified athletic trainer was on site for all games and practices, and all injuries – big or small – had to be logged electronically on a daily basis, explained Dr. Lincoln of the sports medicine research center at Union Memorial Hospital, Baltimore.

During the study period, there were 2,479 observed concussions during nearly 11 million athletic exposures. An athletic exposure was defined as a game or practice. Football led the way, accounting for 53% of all concussions. The other boys' sports included in the study were lacrosse, soccer, wrestling, basketball, and baseball. The girls' sports were soccer, which accounted for 7% of all concussions among high school athletes, along with lacrosse, basketball, softball, field hockey, and cheerleading. Another 15 sports are offered in the school district, but they account for relatively few concussions.

Seventy-five percent of all concussions occurred in boys' sports, which accounted for 53% of athletic exposures. "In terms of who walks in the door to the athletic trainer's room with a concussion, it's a 3-to-1 ratio of boys to girls," Dr. Lincoln observed.

Football had a concussion incidence of

0.6 cases per 1,000 athletic exposures. This was followed by girls' soccer, at 0.35 per 1,000 athletic exposures, and boys' lacrosse, at 0.30 per 1,000. Baseball and cheerleading had the lowest rates at 0.06 per 1,000. That means the incidence of concussion was 10.9-fold greater in football than in baseball, and 6-fold more in girls' soccer than in cheerleading.

Although cheerleading had the lowest concussion incidence among girls'

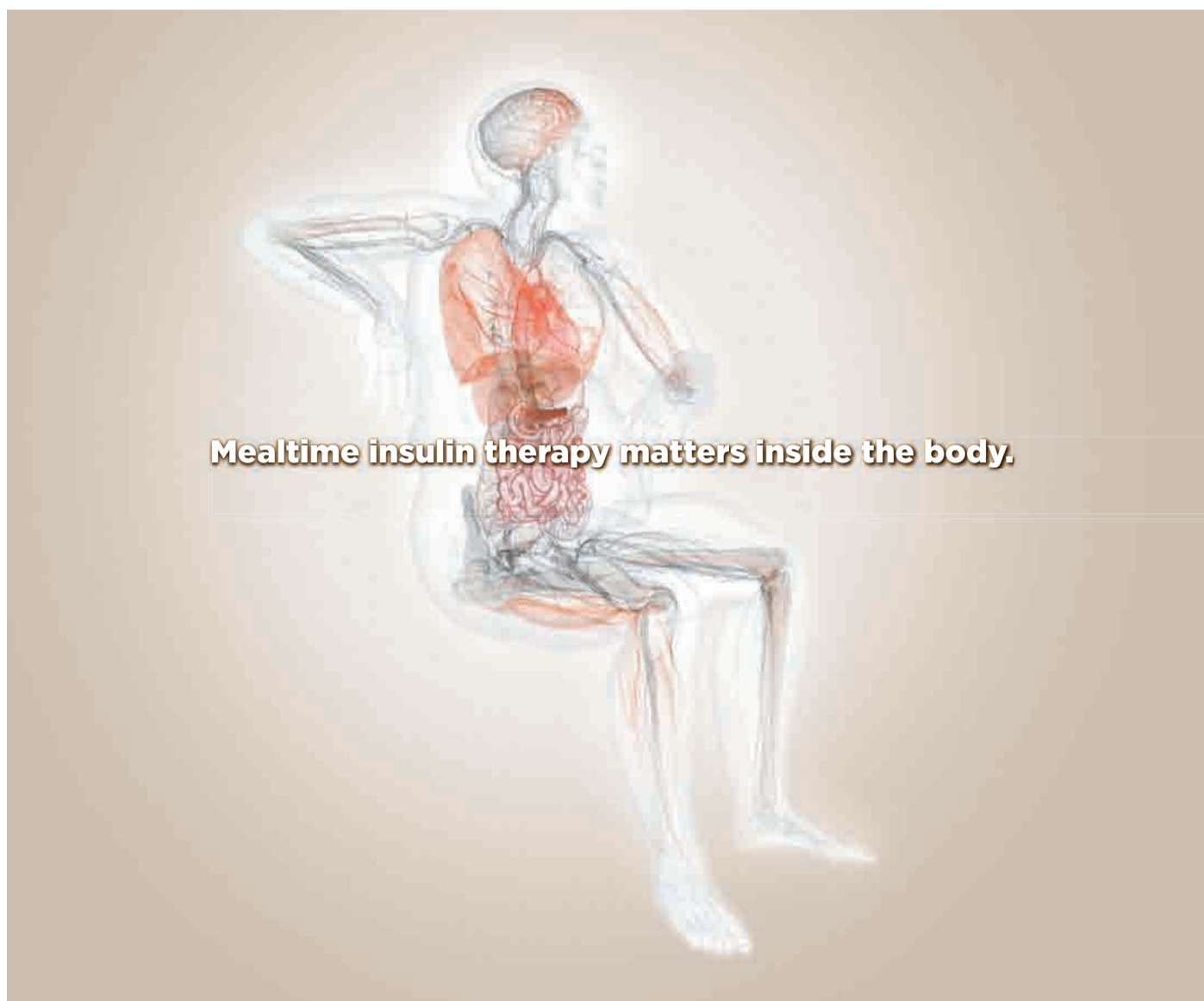
sports, it accounted for 5% of all athletic concussions, putting it in a fourth-place tie with wrestling for that dubious distinction.

In the three sports that are closely similar for boys and girls – basketball, soccer, and baseball/softball – the concussion rate was consistently twice as great for girls. This gender disparity has previously been described at the collegiate level, but this is the first study to

demonstrate the same phenomenon at the high school level, according to the researcher.

While both boys and girls play high school lacrosse, these are two very different sports. In boys' lacrosse, it's a full-on collision sport, helmets and pads required. For girls it's an incidental contact sport requiring only protective eye wear.

The concussion rate in the school dis-



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Important Safety Information

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Important Safety Information, continued

Warnings

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trict increased by an average of 16.5% annually during the study period for a 4.6-fold jump between 1997 and 2008. The increase was seen in all 12 sports. Football had the smallest annual increase rate, at 8%, while concussions in cheerleaders jumped by 26% per year and in wrestlers by 27% annually.

“The major concerns are football, girls’ soccer, and boys’ lacrosse. However, the increasing incidence across all sports suggests the focus on concussion detection, treatment, and prevention should not be limited to those sports traditionally associated with concussion

risk,” according to Dr. Lincoln.

It’s unclear whether the explanation for the marked rise in concussion incidence over time is that sports have gotten more aggressive, or coding and diagnosis have improved. Most likely the answer lies in a combination of both, he said.

Why the markedly higher concussion



risk in girls compared with boys playing the same sports? Dr. Lincoln said other investigators have put forth three hypotheses. One is that boys’ greater muscle mass can absorb more of the impact energy that would otherwise be transferred to the brain. Another possibility is that girls might be culturally more willing to report injuries and seek care. And

DR. LINCOLN

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perhaps hormonal differences are at work as well; studies have shown that girls take longer to recover from concussions.

Governing bodies for professional and amateur sports are now taking concussions and their potential long-term sequelae far more seriously than even a few years ago, Dr. Lincoln said.

“I think if we look at this in terms of any other public health issue we would all be pretty outraged, so I’m kind of glad to see the outrage in society right now, and the movement on policy issues as well,” he said. ■



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Important Safety Information, continued

Warnings, continued

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Important Safety Information, continued

Other Side Effects, continued

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