



Grant Information Summary:

Single Kidney and Sports Participation

Practical Significance Statement

The purpose of this study is to review the National Athletic Trainer's Association (NATA) injury surveillance program database for information regarding kidney injury during high school varsity sports participation. This information will be published to assist physicians, families and athletes in making evidence-based decisions regarding the participation of children and adolescents with single, normal kidneys in contact/collision sports.

Study Background

The American Academy of Pediatrics recommends a "qualified yes" favoring participation of athletes with single kidneys in contact/collision sports. Despite this recommendation and minimal published data, most physicians continue to discourage participation in contact/collision sports for such patients.

Objective

The primary objectives of this study were to: 1. Evaluate the NATA High School Injury

Surveillance database to identify any occurrences of sports related kidney injury; 2. Determine which contact/collision sports, if any, are associated with an increased risk of catastrophic kidney injury; 3. Compare the incidence of catastrophic kidney injury to serious reportable injuries of other organ systems such as brain, spine, eye and knee and 4. Use the NATA High School Injury Surveillance database to increase the available evidence to assist physicians in making recommendations for athletes with single, normal kidneys.

Design And Setting

The NATA **High School Injury Surveillance** database is a three-year observational cohort study. Injury and participation information for varsity athletes was collected during all practice and game sessions.

Subjects

During the 1995-1997 academic years, 246 certified athletic trainers (ATCs) representing 235 US high schools monitored varsity boy's football, baseball, and wrestling, girl's volleyball, softball, and field hockey and boy's and girl's basketball and soccer. 23,666 total injuries were recorded from 74,298 team seasons and over 4.4 million injury exposures.

Measurements

The ATCs present at each game and practice session reported injuries and participation data via a standardized surveillance protocol. Injury case rates (injuries/thousand exposures) for kidney, head/neck/spine, mild traumatic brain injury (MTBI), knee, eye and testicle were calculated. Differences in injury rates between organs and sports were calculated using an incidence density ratio (IDR). Statistical analysis was performed using the SigmaStat software.

Results

This study investigated 6,921 of the 23,666 total injuries in the NATA High School Injury Surveillance database including 18 kidney injuries, 2,069 head/neck/spine, 1,219 MTBI, 3,450 knee, 148 eye, and 17 testicle. None of the kidney injuries were to a single kidney

or lead to loss of function. Kidney injuries were reported for football (12), girl's soccer (2), and boy's/girl's basketball, boy's soccer and baseball (1 each). Softball, field hockey, girl's volleyball, and wrestling had no reported kidney injuries. For all sports, the injury case rates for kidney (0.002 - 0.009) were significantly less than head/neck/spine (0.05 - 1.08), MTBI (0.02-0.59), and knee (0.2-1.22) ($P<0.01$). Kidney injury case rate was less than eye (0.047-0.056) for baseball and boys' and girls' basketball ($P<0.01$). Compared to kidney injury, IDR's among all sports for head/neck/spine (16-117), MTBI (15-69), and knee (90-274) were significantly higher than kidney among all sports ($P<0.01$). In baseball and boy's/girl's basketball, IDR's for eye injury (16-23) were significantly higher than kidney ($P<0.01$).

Conclusions

Sports-related kidney injuries are exceedingly rare and occur significantly less often than MTBI, knee and head/neck/spine injuries among common high school sports. Limitation of athletic participation based solely on the presence of a single kidney is unwarranted.

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Matthew M. Grinsell received his M.D degree from the University of Nevada School of Medicine, and Ph.D degree in Cell and Molecular Biology for the University of Nevada, Reno. Currently, Dr. Grinsell is completing his Fellowship in the Division of Nephrology within the Department of Pediatrics at the University of Virginia.

Publication & Presentation List

Grinsell MM, Graslie KA, Powell JW, Gurka MJ, Gurka KK, Norwood VF. Sports Related Kidney Injury: A Prospective Assessment of Relative Risk. American Society of Nephrology General Meeting, San Diego, CA 2006.

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