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Study Finds Changes in Brains of Hockey Players Who Had Concussions

By JEFF Z. KLEIN FEB. 4, 2014

Hockey players who sustained concussions during a recent season experienced acute microstructural changes in their brains, according to a series of studies published in the *Journal of Neurosurgery* on Tuesday.

“We’ve seen evidence of chronic injuries later in life from head trauma, and now we’ve seen this in current players,” said Dr. Paul Echlin, an Ontario sports concussion specialist who conducted the study in collaboration with Dr. Martha Shenton of Brigham and Women’s Hospital and researchers from Harvard Medical School, Massachusetts General Hospital and Western University of Canada.

The researchers said these were the first studies in which an independent medical team used magnetic resonance imaging analysis before, during and after a season to measure the effects of concussions on athletes. Forty-five male and female Canadian university hockey players were observed by independent physicians during the 2011-12 season.

All 45 players were given M.R.I. scans before and after the season. The 11 who received a concussion diagnosis during the season were given additional scans within 72 hours, two weeks and two months of the incident.

The scans found microscopic white matter and inflammatory changes in the brains of individuals who had sustained a clinically diagnosed concussion during the period of the study.

Additional analysis found that players who sustained a concussion during the study period or reported a history of concussions showed significant differences in their brains’ white matter microstructure compared with players who did not sustain a concussion, or who reported no history of concussions.

The changes in microstructure may reflect microhemorrhaging, neural injury or other inflammatory responses to brain trauma, researchers said.

They also said the imaging techniques used in the study might provide a model for monitoring acute and cumulative brain injury sustained by athletes.

The researchers found the incidence of concussion observed among the players in the study was three to five times higher than that previously reported in medical literature. That finding is consistent with other recent studies showing that concussions in hockey occur more frequently than previously believed.

“How many more studies do we need before we realize significant changes are needed in the way we play the game?” Echlin said.

He added: “We want our children to keep playing hockey and other sports for the fun, health benefits and heightened self-esteem they derive from it. But we have to look seriously at the structure of the games our children play. We have to protect our children’s brains.”

Echlin said further research was needed on larger populations of athletes in other contact and noncontact sports and on nonathletes to validate the results.