A cause for concern?

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Just to add to the recent concern over heading soccer balls and the risk of chronic brain injury, another study has just appeared that raises new fears. In a paper published in Brain, Chio and his colleagues from Italy reported that there was an increased risk of developing motor neuron disease (MND) among Italian soccer players. In this retrospective cohort study, there were eight diagnosed MND cases in a subpopulation of 7435 soccer players of the top two Italian divisions who played in the period from 1970 to 2001. Although only small numbers of MND patients were identified, this exceeded the statistical likelihood of developing MND in this population.

This paper adds to the growing body of concern in regard to the risk of developing this condition from sport. Previously a judicial report from the Italian soccer leagues raised similar concerns. A 4 year study commissioned by a local magistrate looked at every player in Serie A and B between 1960 and 1997. Of the total of 24,000 calciatori, eight were found to have died from MND. A further follow up of the players who were dead or who had fallen since 1997 found a further 32 cases.

The Guardian has reported that MND has claimed a number of former players in England in recent years, including Don Revie, Rob Hinchliffe of Derby and Sunderland, Middlesbrough’s Will Maddren, and the former Celtic winger Jimmy Johnstone. As a result long term follow up studies of English footballers have been proposed.

DOES NEUROTRAUMA CAUSE MND?

Trauma having been dismissed but never proved to be a key factor for MND.

Environmental risk factors of neurodegeneration in MND have also been suspected. Cycad nuts were found to be a chronic neurotoxic risk for the Guam population who develop a different condition that shares a number of clinical features with MND; other putative environmental risk factors for amyotrophic lateral sclerosis (ALS) include a history of nervous system trauma, exposure to heavy metals, radiation, electrical shocks, welding or soldering materials, and employment in paint, petroleum, or dairy industries.

Could the effect of repetitive heading soccer balls be somehow related to the development of MND in the presence of a genetic predisposition? An association between MND and head trauma has never been clearly demonstrated nor has there been the association between skeletal fracture of head, neck, or spine and the diagnosis of MND.

A Medline survey of the medical literature found only prospective studies on this topic with just one cohort study of ALS after head injury. In this cohort of 821 individuals who had suffered a head trauma between 1935 and 1974, a weekly rate of 0.4 per 100,000 was found. Of the 821 patients, 80 were found to have died of ALS—unexpected in a small population of 821. Of the other reports retrospectively evaluating the frequency of ALS in a group of 821 cases, all of the other reports retrospective evidence of a link between neurotrauma and the development of MND is found in small numbers of patients.

A paper published in Brain, 1988, reported that there was an increased risk of developing MND in the 1980s, and Glenn Montgomery of the Seattle Seahawks lost his life to MND in 1998.

It is likely that the pathogenesis of MND reflects a complex interaction between environmental factors and specific susceptibility genes. To date, only some of these genes have been identified.

Approximately 1–2% of the cases of sporadic ALS and 15–20% of familial ALS are caused by mutations of superoxide dismutase 1 (SOD1), which belongs to the endogenous antioxidative system. The fact that transgenic expression of a human SOD1 mutation (SODG93A) leads to an MND-like disease in mice underlines the pathophysiological significance of this mutation. Apart from a single major gene responsible for the disease, MND may also be caused by a variety of environmental combinations that may, in part, explain the so-called sporadic cases that require co-factors to occur. Among these co-factors, neurotrauma may play a prominent role. Athletes with an athletic body type significantly linked in at least one to the reference.

REFERENCE


Retraction: A cause for concern?


This article has been retracted due to plagiarism of the following material:


We would like to acknowledge the preliminary work of Nick Brown in investigating publications by Dr Paul McCrory and thank him for bringing these concerns to our attention.

During 2021 and 2022 there was an investigation by British Journal of Sports Medicine and BMJ which found that some of McCrory’s work was the product of publication misconduct. British Journal of Sports Medicine published a summary of the investigation.¹

References


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