

AAN 68th ANNUAL MEETING ABSTRACT

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Abstract Title: Incidence of Traumatic Brain Injury (TBI) in Retired NFL Players. Correlation with Diffusion Tensor (DTI) MRI and Neuropsychological Testing.

Press Release Title: Study: More than 40 Percent of Retired NFL Players Had Brain Injury

Objective: To determine the incidence of TBI in retired NFL players using conventional and advanced neuroimaging studies, and correlate the findings with various neurocognitive measures.

Author(s): Francis X. Conidi, MD, DO; Edward Pegg, MD; John Lloyd, PhD

Background: Retired NFL players are reporting neurocognitive deficits. Some have pathological changes consistent with CTE.

Design/Methods: A prospective analysis was conducted including neurological history/examination, extensive neuropsychological evaluation, and Conventional/Advanced neuroimaging studies including DTI MRI in 40 retired NFL players. Individuals with fractional anisotropy (FA) values 2.5 standard deviations below aged matched controls were considered to have a positive study.

Results: Mean age was 35.85 (range 27-56 years). They played an average of 7 years (range 2-17) in the NFL and reported an average of 8.1 concussions. Twelve (31%) reported numerous sub-concussive hits. All had normal neurological exams. Mean MMSE score was 27.3 range (16-30), CDR scale was 0.5, (max was 1.0). Seventeen (42.5%) players had positive DTI MRI's. Twelve (30%) demonstrated evidence of traumatic axonal injury on conventional MRI. Neuropsychological testing demonstrated significant abnormalities in attention and concentration (42%), executive function (50%), learning/memory (44.7%), spatial/perceptual function (23.7%). There was a correlation with number of years played and positive DTI ($p=0.0491$). No correlation was found between years played and positive conventional MRI. There was no correlation between number of concussions and positive DTI. An inverse correlation was found between number of years played and number of concussions.

Conclusion: Preliminary results of this ongoing study demonstrate a significantly higher incidence of TBI in retired NFL players when compared to the general population. Longer careers place the athlete at significantly higher risk of TBI.