Genetics Influence Neurocognitive Performance at Baseline but Not Concussion History in Collegiate Student-Athletes

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Abstract:
Objective: This study investigates 4 single-nucleotide polymorphisms [Apolipoprotein E (APOE), APOE promoter, catechol-Omethyl transferase (COMT), and dopamine D2 receptor] that have been implicated in concussion susceptibility and/or cognitive ability in collegiate student-athletes.

Design: Cross-sectional study.

Setting: Neuroscience laboratory at Elon University.

Participants: Two hundred fifty division I collegiate student-athletes (66 women, 184 men) from various sports.

Intervention: All participants completed Immediate Post-concussion Assessment and Cognitive Testing (ImPACT) testing at baseline concussion testing and had a buccal swab taken for DNA for genotyping.

Main Outcome Measures: Self-reported history of concussions and neurocognitive performance were taken from ImPACT.

Results: Individuals carrying an e4 allele in their APOE gene had a significantly slower reaction time (P=0.001). Individuals homozygous for the Val allele of the COMT gene showed significantly worse impulse control scores (P=0.014). None of the genotypes were able to predict self-reported concussion history in collegiate student-athletes.

Conclusions: These results indicate that certain genotypes may influence performance on cognitive testing at baseline and that the APOE genotypes may not influence concussion susceptibility as suggested by past studies.

Key Words: concussions, mild traumatic brain injury genetics, neurocognitive performance, cognitive function.

Biography
Dr. Kenneth P. Barnes is an orthopedic surgeon in Greensboro, North Carolina and is affiliated with one hospital. He has been in practice between 11-20 years.

Publication of speakers:
4. Mahley RW, Weisgraber KH, Huang Y. Apolipoprotein E.