NECK STRENGTH, FLEXIBILITY, POSTURE, AND PROPRIOCEPTION IN U.S. ARMY PILOTS WITH AND WITHOUT A HISTORY OF NECK PAIN

T. NAGAI, J.P. ABT, T.C. SELL, N.C. CLARK, B.W. SMALLEY, M.D. WIRT, S.M. LEPHART

Neuromuscular Research Laboratory, University of Pittsburgh, Pittsburgh, PA, US Army School of Aviation Medicine, Fort Rucker, AL, Blanchfield Army Community Hospital, Fort Campbell, KY

INTRODUCTION: Neck pain (NP) is common among military helicopter pilots. Previously, military helicopter pilots with a history of NP demonstrated less neck strength and flexibility compared to pilots without a history of NP. Other factors such as weak scapular muscles, poor head and shoulder posture, and impaired cervical proprioception at end range of motion are considered to be contributing factors for NP but have not been investigated in military helicopter pilots. METHODS: A total of 28 Army helicopter pilots (aircrafts: AH64=8, UH60=6, CH47=1, OH58=13) who reported NP in the past 12 months (28 males, age: 34.8±6.4yrs, height: 176.8±7.0cm, mass: 84.3±11.3kg) were matched based on gender/age (±5yrs) with pilots (aircrafts: AH64=9, UH60=7, CH47=3, OH58=9) without a 12-month history of NP (28 males, age: 34.4±6.0yrs, height: 177.2±8.3cm, mass: 83.0±11.8kg). All pilots had flown at least 100 hours in the past 12 months (total flight-hours: NP group: 1833.0±1443.4hrs, non-NP group: 2044.0±1548.5hrs) and were free of NP on the day of testing. All pilots completed testing for neck and shoulder strength and flexibility, forward head and shoulder posture, pectoralis minor length, and cervical active joint position sense. Paired t-tests or Wilcoxon tests were used to compare differences between groups (p<0.05). RESULTS: Pilots with a history of NP had significantly less neck flexibility in flexion-extension (NP group: 120.8±15.6°, non-NP group: 127.3±9.2°), lateral flexion (NP group: 98.8±14.5°, non-NP group: 106.2±17.7°), and rotation (NP group: 136.2±17.7°, non-NP group: 145.8±13.6°) compared to pilots without a history of NP (p<0.05). CONCLUSION: These results demonstrate impaired neck flexibility in pilots with a history of NP. Operating a helicopter with limited neck flexibility or NP may negatively impact flight safety and force readiness. Both groups were similar in age and flight experiences (stress from sitting in a forward-lean position for hours under vibration and noise); yet, some pilots develop neck pain. Continued research on modifiable contributors of NP is warranted.

(294 words, 300 limit)