

## Late Breaking Research Poster 1143090

### Predicting Language Performance in Adults with Mild Traumatic Brain Injury and Orthopedic Controls



Rocio Norman (University of Texas Health Science Center San Antonio), Sandeep Subramanian, Meghan McDonald, Mackenzie Cross, Manish Shah, Lyn Turkstra

**Objective:** To determine whether speech rate, cognitive performance and neurobehavioral symptoms can be utilized to predict discourse skills in adults with mild traumatic brain injury (mTBI) and a comparison group of adults with non-surgical orthopedic injuries (OI).

**Design:** Prospective experimental design.

**Setting:** Academic medical center.

**Participants (or Animals, Specimens, Cadavers):** Volunteer participants were recruited from an emergency medicine department (ED) in the Midwestern United States. Participants were diagnosed with an mTBI or OI by a medical provider in the ED. Eighteen adults with mTBI (Females=12) and thirteen with OI (Females= 8) were included. All participants reported English as their primary language and denied a history of learning, speech-language and neurological disorders. All participants took part in the study between three weeks and three months post-injury.

**Interventions:** Not applicable.

**Main Outcome Measure(s):** Cinderella Story performance (words per minute) from AphasiaBank Protocol. Regressors included NIH ToolBox Cognition Battery, Neurobehavioral Symptom Inventory, and Speech Rate (syllables per minute). Analyses included t-tests and multiple regression analyses.

**Results:** Cinderella story performance and scores on NSI and NIH ToolBox scores were similar between groups ( $p>0.05$ ). Speech rate explained majority of variance in Cinderella story performance (MTBI; 69%, OI: 50%) in both groups. The overall model fit  $R^2=0.96$  for MTBI and OI.

**Conclusions:** This preliminary study demonstrates that speech rate predicts language performance in adults with mTBI and OI and can potentially be used in clinical settings. A lack of a difference in discourse performance is perhaps attributable to the limited sensitivity of this measure. More research is necessary to develop assessments that accurately distinguish brain vs. bodily trauma-related deficits.

**Author Disclosure(s):** The authors have no disclosures to report.

**Key Words:** Concussion, Speech, Traumatic Brain Injury, Language, Discourse

## Late Breaking Research Poster 1143145

### Prevalence of Mild Traumatic Brain Injury in the Pediatric Population within an Integrated Healthcare System



Richard Delmonico (Kaiser Foundation Rehabilitation Center), Brian Theodore, Lue-Yen Tucker, Michelle Camicia

**Objective:** Traumatic Brain Injuries (TBI) in children result in significant disability, costs, and medical utilization. However, the vast majority of these injuries are mild traumatic brain injuries (mTBI) and have sequelae including psychiatric disorders. The goal of this study is to report the prevalence of mTBI in children treated in an integrated healthcare system.

**Design:** Observational study.

**Setting:** An integrated healthcare system covering Northern California.

**Participants (or Animals, Specimens, Cadavers):** Patients aged  $\leq 17$  years with a primary diagnosis of mTBI seen in the emergency departments (ED), urgent care (UC) or any outpatient clinics (OP) between 2001 and 2014. The TBI exposure will be considered mild if ICD-9-CM codes indicated brief (<30 mins) or no loss of consciousness and no

documented traumatic intracranial lesions or other indicators of a more severe brain injury.

**Interventions:** Not applicable.

**Main Outcome Measure(s):** Diagnosis of mTBI.

**Results:** There were 2,106,812 pediatric patients seen in the ED, UC, and OP settings between 2011 and 2014. Of these, 33,172 individuals (1.6%) had a primary diagnosis of mTBI based on ICD-9-CM codes.

**Conclusions:** Findings of this study correspond approximately to reported prevalence rates of 0.8% - 1.3% for females and males, respectively, in pediatric-mTBI related ED visits during 2013. Compared to all prior published studies, the current data constitute the largest pediatric cohort within an integrated healthcare setting and may provide a more accurate reporting of mTBI cases beyond just the ED, but also including those diagnosed at urgent care and outpatient clinics. A follow-up study will analyze the prevalence of psychiatric disorders over a 4-year period post-mTBI, compared to a matched cohort of mTBI-unexposed pediatric patients within the same integrated healthcare system.

**Author Disclosure(s):** Richard Delmonico, Brian Theodore, Lue-Yen Tucker: NoneMichelle Camicia: Consultant for MedBridge

**Key Words:** Mild Traumatic Brain Injury, Concussion, Pediatric Rehabilitation, Epidemiology

## Late Breaking Research Poster 1143132

### Prognostic Value of CT-Based Measurement of Cervical Muscle and Fat in Poststroke Patients



Yongjun Jang (Department of Rehabilitation Medicine, The Catholic University of Korea Seoul St. Mary's Hospital), Yangsean Choi

**Objective:** This study aimed to investigate the association between CT-based measurement of cervical muscle and fat and poststroke functional outcomes.

**Design:** A retrospective cohort analysis.

**Setting:** A tertiary referral hospital.

**Participants (or Animals, Specimens, Cadavers):** 60 hemiplegic post-stroke patients aged 45 to 81 years old, who were physically independent with no previous history of stroke, and who could follow at least one-step commands to cooperate with functional assessments, were eligible.

**Interventions:** Baseline volumes of cervical muscle and fat were measured at the level of odontoid process within two weeks from the onset of stroke using a segmentation software (3D slicer). The threshold of segmentations for muscle/fat was designated according to the reference values from previous studies. Anthropometric measures, laboratory nutritional, and functional parameters were collected from medical records at two weeks (t0) and at six months (t1) poststroke. Univariate and multivariate linear regression were performed among these variables with modified Barthel Index (MBI) (t1) as response.

**Main Outcome Measure(s):** Main outcome measures were CT based muscle/fat volume at the odontoid process level.

**Results:** Univariate linear regression showed that muscle/fat volume (t0), grip strength (t0) and mRS (t0) were significantly associated with MBI at poststroke rehabilitation. Multivariate linear regression analyses showed that muscle volume (t0), grip strength (t0) and mRS (t0) were independent predictors of MBI at six months poststroke.

**Conclusions:** Low cervical muscle and fat volumes at two weeks post-stroke may predict poor functional poststroke outcome(mRS>3) at six months, independent of grip strength and mRS. CT scans that are routinely performed at baseline may be a promising screening tool for sarcopenia in stroke patients.

**Author Disclosure(s):** Authors have nothing to disclose.

**Key Words:** Stroke, Sarcopenia, Recovery of Function, Hand Strength, Hemiplegia