

PURPOSE: To examine the relationship between trunk muscle fatigue, trunk flexibility, and balance in relation to maximum contralateral lean at maximal shoulder external rotation in collegiate baseball pitchers during fastball pitches.

METHODS: Anthropometric measurements, isometric holds in trunk flexion, extension, lateral planks, flexibility, and STAR Excursion Balance Test assessments were performed on 10 Division I Collegiate baseball pitchers ages 18-21 (mean 19.6, SD=1.04) with an average of 7.36 years of pitching experience (SD=3.23). Pitching kinematic analysis of fastball pitches was performed using 3-dimensional motion analysis techniques.

RESULTS: Pearson correlations were performed to assess the association between functional assessments with trunk contralateral lean. The average degree of contralateral lean was 2.33 (SD=3.66). The average pitch speed was 80.3 (SD=5.40). No statistically significant correlations were found between any of the assessments and degree of contralateral lean. However, there was a moderate negative correlation between contralateral trunk lean and pitch speed ($r = -.494, p=.146$).

CONCLUSION: The negative correlation between contralateral trunk lean and fastball pitch velocity and trunk assessments and contralateral trunk lean mean be a result of the small sample size (10 subjects) as previous studies of approximately 100 subjects have shown a positive correlation of contralateral trunk tilt of 10 degrees from neutral with an increase of only 0.5-1mph in pitch velocity.

1867 Board #128 May 31 3:30 PM - 5:00 PM

Sparta Testing and Vertical Jump Co-Predict Fastball Speed in Collegiate Pitchers

William P. Lydon, J. Mark VanNess, John Mayberry, Joey Rossi, Courtney D. Jensen. *University of the Pacific, Stockton, CA.*

(No relevant relationships reported)

In competitive baseball, the most common pitch is the fastball; its velocity associates with strikeout rate and fielding-independent pitching values. The most effective predictors of pitch velocity are currently debated. Coaches and trainers are increasingly relying on advanced systems of assessment, such as Sparta Performance Science (SPS); fewer are relying on simple assessments, such as the vertical jump (VJ). Data supporting the added value of complex assessments are limited.

PURPOSE: To test the effect of VJ and SPS performances on fastball velocity among collegiate pitchers.

METHODS: We enrolled 30 pitchers at a Division I athletics program in Northern California. Every pitcher on the team's roster between 2014 and 2017 was tested. During collection, heights and body weights were documented; an SPS force plate measured Load, Explode, and Drive data; and VJ height was recorded as the best of 3 performances. Fastball velocity was quantified as the mean mph of the fastest 3 in-game pitches at the time of testing. Multiple linear regression tested the effect of VJ and SPS data on pitch speed, controlling for appropriate confounders.

RESULTS: Players were evenly distributed throughout year in school. Average VJ was 19.8 ± 2.5 inches, fastball velocity was 87.4 ± 4.0 mph, SPS Load was 54.2 ± 8.6 , Explode was 51.5 ± 8.4 , and Drive was 54.2 ± 8.8 . Multiple linear regression, holding the players' height and grade constant, found each additional inch of VJ predicted a 0.5 mph increase in pitch velocity ($p < 0.001$; 95% CI: 0.21-0.70). The collection of predictors explained 56% of the variance in speed ($p < 0.001$). In this model, each additional unit of Load predicted a 0.2 mph decrease in speed ($p < 0.001$) while each additional unit of Explode predicted a 0.2 mph increase ($p < 0.001$). The most powerful predictor was year in school: for each additional year, fastball velocity increased by 2.1 mph ($p < 0.001$). SPS Drive was not a significant predictor ($p = 0.491$).

CONCLUSION: In the age of sophisticated analytics equipment, the VJ remains a compelling predictor of fastball velocity, but it predicts in tandem with the SPS technology. The information gathered from a comprehensive athletic evaluation can help coaches evaluate the athleticism of their athletes and inform decisions regarding individualized conditioning programs.

D-64 Free Communication/Poster - Disabilities

Thursday, May 31, 2018, 1:00 PM - 6:00 PM

Room: CC-Hall B

1868 Board #129 May 31 2:00 PM - 3:30 PM

Influence of Therapeutic Horseback Riding on Motor Proficiency in Youth with Sensory Processing Dysfunction

Brandon R. Rigby¹, Ronald Davis¹, Melissa Bittner², Robin Harwell³, Eileen Leek³, Geoben Johnson¹, David Nichols, FACSM¹. ¹Texas Woman's University, Denton, TX. ²California State University Long Beach, Long Beach, CA. ³ManeGait Therapeutic Horsemanship, McKinney, TX. (Sponsor: David Nichols, FACSM)

(No relevant relationships reported)

Individuals with sensory-integration delays may have some deficit in motor planning, or difficulty interacting with and influencing their surroundings. The demonstration of age-appropriate motor skills is therefore a primary outcome measure in this population. Therapeutic horseback riding may provide the necessary physical adaptations to improve motor skill proficiency.

PURPOSE: To characterize motor skill proficiency following 8 weeks of therapeutic horseback riding with sensory integration therapy in children with sensory processing dysfunction.

METHODS: Twenty-seven children, ages 5 to 18 years, were recruited. All participants completed the same 32-week protocol that was separated into 4, 8-week blocks: a) a control period (no riding); b) a riding only period; c) a washout period (no riding); d) riding with additional sensory integration therapy (combination). Before and after each period, motor skills were assessed using the *Bruininks-Oseretsky Test for Motor Proficiency (2nd edition)*. A one-way repeated-measures ANOVA was used to determine any differences between testing periods. A significance level of 0.05 was used.

RESULTS: All subtest scores were statistically similar ($p > 0.05$), with the exception of manual dexterity, which was different between pre-control and post-washout ($p = 0.018$), post-control and post-washout ($p = 0.024$), and pre-control and post-combination ($p = 0.037$). Overall scores were different between pre-control and post-combination ($p = 0.003$) and post-control and post-combination ($p = 0.009$).

CONCLUSION: Therapeutic riding may have a latent effect of improving overall motor skills in children with sensory processing dysfunction.