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Effects of a Four-Week Stretching Program on Shoulder Range of Motion and Throwing Velocity among Collegiate Baseball Players

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ABSTRACT

Chronic static stretching programs have been reported to increase shoulder range of motion (ROM), but no study has examined how this increase may affect throwing velocity in overhead athletes. It was hypothesized that a 4-week stretching program would increase the ROM of the glenohumeral joint and also increase throwing velocity among collegiate baseball players. Baseline shoulder ROM and overhand throwing velocity were assessed before participants were matched into either a control group (CON, n=7) or an experimental group (STRETCH, n=8). The STRETCH group then performed two sets of two stretches (the cross-body stretch and the sleeper stretch), 30 seconds each, four times per week for a duration of four weeks. Results revealed that horizontal adduction ROM for both active (A) and passive (P) measures increased significantly in STRETCH compared to CON over time (STRETCH: Pretest: A=39.8 ± 8.8°, P= 42.5 ± 5.2°; Posttest: A= 43.3 ± 3.5°, P= 45.4 ± 3.1°; CON: Pretest: A= 41.6 ± 10.6°, P= 45.3 ± 11.2°; Posttest: A= 36.3 ± 5.7°, p=0.018, P= 40.0 ± 6.1°, p=0.020). Passive extension ROM also had a significant interaction (p =0.023), while external rotation increased more in STRETCH than in CON, but this interaction failed to reach significance (p=0.054). There were no significant differences between internal rotation, flexion or throwing velocity over time or between treatment groups. Despite the lack of change in throwing velocity with the stretching program, the correlation between the change in horizontal adduction and the change in velocity showed a significant positive relationship (R^2= 0.518 , p=0.005). More research is needed to solidify the possible relationship between range of motion and throwing velocity in collegiate baseball players.

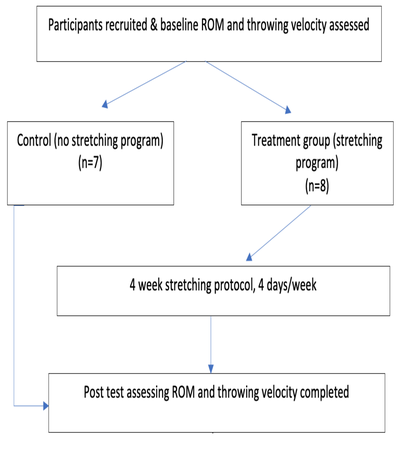
INTRODUCTION

- Stress placed on baseball players shoulders causes a build up of scar tissue and inflammation thus ↓ ROM
- Stress causes adaptations in shoulder
- i.e. ↓ internal rotation
- Wanted to see if a reversal of these adaptations via a stretching program could possibly increase throwing velocity reducing the need for injury prone weighted ball programs

METHODS

Subjects:

. 14 Hope College baseball players
. 18-22 years of age



METHODS

Participants from the stretching group performing the cross-body stretch.

Participant from the stretching group performing the sleeper stretch over the course of the 4-week period.

RESULTS

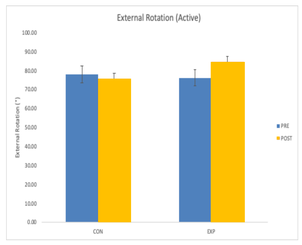


Figure 1. The figure represents external rotation between control and experimental groups from pre to post test. No significant interaction was seen (p>0.05).

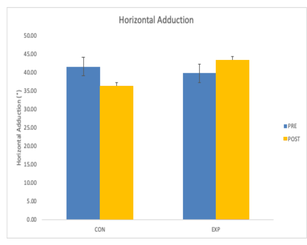


Figure 2. The figure represents horizontal adduction measures between the control and experimental group over time. A significant interaction was seen with the experimental group increasing significantly more than the control (p<0.05).

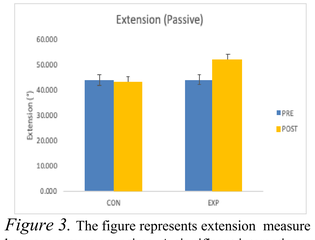


Figure 3. The figure represents extension measure between groups over time. A significant interaction was seen with the experimental group increasing significantly more than the control (p<0.05)

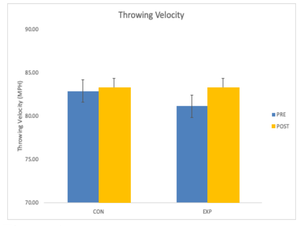


Figure 4. The figure represents throwing velocity measures between groups over time. There was no significant interaction seen (p>0.05).

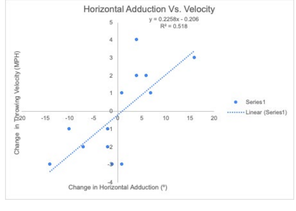
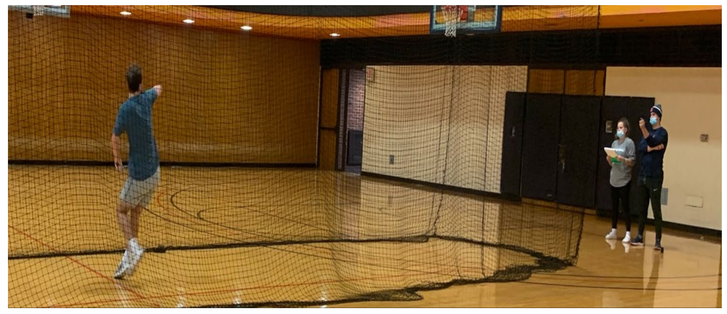


Figure 5. This figure represents a correlation between the change in throwing velocity and the change in horizontal adduction. A significant positive correlation was found (p = 0.005).

CONCLUSION

- There was a significant **increase** in active external rotation, passive extension, and horizontal adduction
- There was **no increase** in internal rotation or flexion
- There was **no significant difference** in throwing velocity between groups, but there was a **significant positive correlation** between the change in velocity and the change in horizontal adduction.



Participant performing the maximal run and gun overhand throw

Implications: A chronic stretching program could offer an avenue to increase ROM and with further research may also be beneficial for the throwing velocity of collegiate baseball players offering a safer alternative to strength or weighted ball training.

Limitations: Small sample size (n=15), players were out of season, not supervised in person (videos), small number of sets, duration of study, groups were not the as similar in the beginning as we had hoped.