RESULTS: Knee extension 1RM increased in both conditions (NBFR=6% vs WBFR=9.5%, p=0.001). The CSA of the proximal region did not change following either condition (p=0.05), however, more than half of subjects from WBFR had their CSA reduced. There were increases in CSA of the middle and distal regions in the NBFR (6.2% and 5.6%) and WBFR (3% and 5.4%), respectively. The NBFR condition completed greater exercise volume compared to the WBFR (1026 kg vs 750 kg). The femoral blood flow was similarly reduced in both conditions (NBFR = 58.1% vs WBFR = 70%).

CONCLUSIONS: The current study found no difference in CSA of the proximal region with either the wide or narrow cuff. Further, and although not significant, individual response data suggested that the proximal and middle regions may have also been attenuated and/or reduced by the wide cuff in some participants. These preliminary findings appear to suggest that cuff width may exert differential responses despite being inflated to the same relative pressure.

3707 Board #146
June 4, 9:30 AM - 11:00 AM
Venous versus Arterial Blood Flow Restriction: The Impact of Cuff Width
J Grant Mouser, Samuel L. Buckner, Brittany R. Counts, Scott J. Dankel, Matthew B. Jesssee, Kevin Mattocks, Gilberto C. Laurentino, Jeremy P. Loenneke. The University of Mississippi, University, MS.

(Purpose) In the blood flow restriction (BFR) literature, some studies have recommended that the pressure be made relative to the systolic pressure of the cuff being applied, however, little is known about the cuff width’s influence on diastolic pressure.

PURPOSE: To examine the systolic and diastolic pressure measurement across three different cuff widths commonly used in the BFR literature. Based on the diastolic pressure, we also explored how different cuff pressures affected venous and arterial flow.

METHODS: 43 participants (women=27, men=16) completed one visit. Following anthropometric measures and 10 minutes of supine rest, blood pressure was measured using one of three (5 cm, 10 cm, 12 cm) randomly assigned cuffs. Five minutes of rest occurred between each measurement until all cuffs had been used. A one way repeated measures ANOVA was used to explore the influence of applied pressure on venous/arterial circulation. Values greater than diastolic pressure were classified as affecting both venous and arterial flow. Significance was set at p=.05.

RESULTS: There was an inverse relationship between cuff width and systolic for both men [5 cm: 160 (16) mmHg; 10 cm: 125 (8); 12 cm: 122 (9), p<0.001] and women [5 cm: 139 (18) mmHg; 10 cm: 114 (11); 12 cm: 110 (10), p<0.001], with men having greater pressures (p<0.001). For diastolic there was an inverse relationship with cuff width for both men [5 cm: 75 (8); 10 cm: 68 (9); 12 cm: 63 (11), p<0.001] and women [5 cm: 89 (15) mmHg; 10 cm: 67 (10); 12 cm: 63 (11), p<0.001] with men having greater pressure in the 5 cm and 10 cm cuffs (p<0.04). Our exploratory analyses suggest that applied pressures of 10% [5 cm: 80 (14) mmHg; 10 cm: 57 (9); 12 cm: 53 (10), p<0.001] to 60% [5 cm: 6 (9) mmHg; 10 cm: 1 (8); 12 cm: 3 (9), p<0.001] of measured systolic pressure predominately affect only venous circulation.

CONCLUSION: Systolic and diastolic pressure measurements both change with cuff width. We wish to stress the need to base pressures used in BFR off of the cuff width actually being applied to the limb. Further, our data suggests that future investigations need to report whether the BFR protocols used are affecting venous flow only, or both venous and arterial flow.

3708 Board #147
June 4, 9:30 AM - 11:00 AM
The Influence of Cuff Width and Sex on Arterial Occlusion: Implications for Blood Flow Restriction Research
Matthew B. Jessse1, Samuel L. Buckner1, Scott J. Dankel1, Brittany R. Counts1, Takashi Abe2, Jeremy P. Loenneke1. 1The University of Mississippi, University, MS. 2National Institute of Fitness and Sports in Kanoya, Kagoshima, Japan.

(Purpose) The cuff width used for BFR has a significant impact on AOP in the upper arm. Future studies should acknowledge this, and ensure that cuff-widths are reported.

PURPOSE: To examine differences in arterial occlusion pressure (AOP) of the upper arm when applying cuff widths (5 cm, 10 cm, and 12 cm) commonly used in blood flow restriction (BFR) research. This study also examined how individual predictors of AOP changed across cuff widths.

METHODS: Two hundred forty-nine (102 males and 147 females) participants visited the laboratory once. Height, body mass, arm length, and arm circumference were assessed. Following a 10-minute rest, brachial blood pressure was measured (systolic = bSBP and diastolic = bDBP). With a rest period of 5 minutes before each measurement, standing AOP was determined on the right arm for each cuff (counterbalanced) using a Doppler probe placed at the radial artery. Hierarchical linear regression was used to determine which predictors explained the most unique variance in AOP for each cuff width. To examine sex differences, a repeated measures ANOVA with a between subjects factor of sex tested differences in systolic and diastolic pressures. A two way repeated measures ANOVA was used to explore the influence of applied pressure on venous/arterial circulation. Values greater than diastolic pressure were classified as affecting both venous and arterial flow. Significance was set at p≤.05.

RESULTS: Occlusion pressure was different across cuff widths (p<0.001). The 5 cm wide cuff required the greatest pressure [145 (19) mmHg], followed by the 10 cm [123 (13) mmHg], and 12 cm [120 (12) mmHg] wide cuffs. A model of arm circumference, bSBP, arm length, bDBP, and sex explained the most variance in AOP for all three cuff widths (5 cm, R2 = 0.651; 10 cm, R2 = 0.570; 12 cm, R2 = 0.557). However, arm circumference always explained the most unique variance in AOP (5 cm, Part = .554; 10 cm, Part = .419; 12 cm, Part = .406). Differnes in AOP existed between sexes for the 5 cm [males 149 (19) vs females 142 (19) mmHg, p = 0.003, d = 0.36], 10 cm [males 127 (13) vs females 121 (13) mmHg, p = 0.002, d = 0.48], and 12 cm [males 122 (12) vs females 118 (12) mmHg, p = 0.009, d = 0.33] wide cuffs.

CONCLUSIONS: The cuff width used for BFR has a significant impact on AOP in the upper arm. Future studies should acknowledge this, and ensure cuff width is reported. Further, individual differences, primarily arm circumference, should be accounted for when applying relative inflation pressures.

G-34 Free Communication/Poster - Nutritional Status and Anthropometry
Saturday, June 4, 2016, 7:30 AM - 11:00 AM
Room: Exhibit Hall A/B

3709 Board #148
June 4, 8:00 AM - 9:30 AM
Age of Peak Height Velocity to Predict Biological Maturity in Professional Adolescent Mexican Soccer Players
María F. Bernal-Orozco1, Margarita Posada-Falomi2, Celia M. Quiñónez-Gastélum3, Paola Plascencia-Aguilera2, Paola Plascencia-Aguilera2, Juan R. Arana-Nuñó2, Juan P. Tamayo-González2, Rafael Ortega-Orozco2, Gabriela Macedo-Ojeda2, Fabiola Márquez-Sandovali2, Barbara Vizmanos-Lamotte2, OBNOMILIFE, GUADALAJA, Mexico. 3Club Deportivo Guadalajara, A.C., GUADALAJARA, Mexico. Universidad de Guadalajara. GUADALAJARA, Mexico.

(Purpose) To determine the predicted maturity classification (PMC) in a group of adolescent Mexican soccer players through the estimation of age of peak height velocity (APHV).

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