PHYSIOLOGICAL MEASUREMENTS
PRE/POST 100-MILE ENDURANCE RACE

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INTRODUCTION

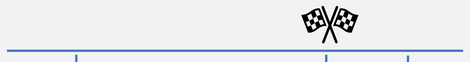
- The popularity of distance running has soared in recent decades with more people running ultra-marathons than ever before.
- The minimum ultra-marathon distance is anything above 26.2 miles.
- There are few research studies available on 100-mile distance running focused on elite/world class mountain ultra marathoners.
- There are few studies available on runners that represent recreational/non-elite runners who live and train in the Midwest.

The purpose of this study is to measure physiological changes and the impact a 100-mile endurance race can have on the body.

Demographics

n=10 males	Mean ± SD	Minimum	Maximum
Age (years)	36.6 ± 14.1	20	60
Height (cm)	177.4 ± 7.2	165	186
Weight (kg)	75.4 ± 7.1	64.1	90
VO_2 (mL/kg/min)	52.8 ± 6.3	45.7	64.1
Average finish time	26:10:36	20:39:50	33:27:59

METHODS

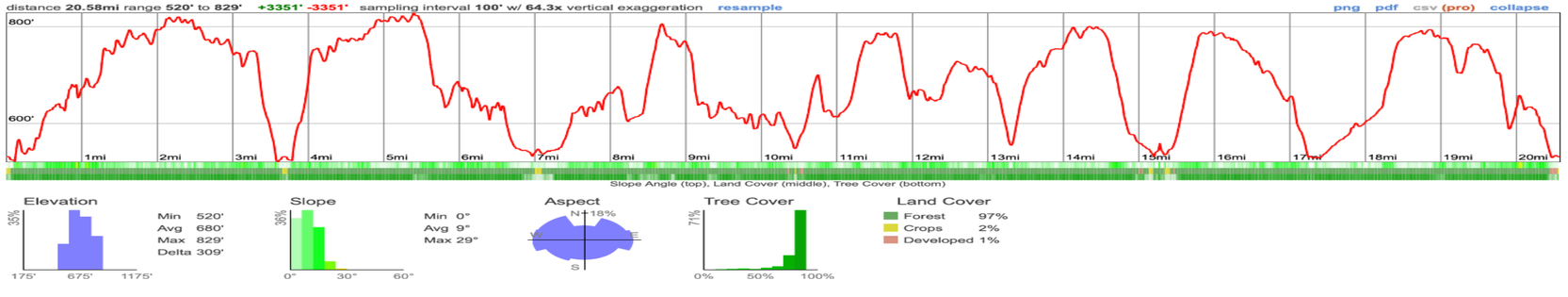


Visit 1
1-week pre-race

- Heart Rate
- Body Mass
- Height
- Ultrasound
- Biodex Balance Assessment
- Resting Metabolic Rate
- Body Water Assessment
- Muscular Strength
- VO2max

Visit 2
2-3 days post-race

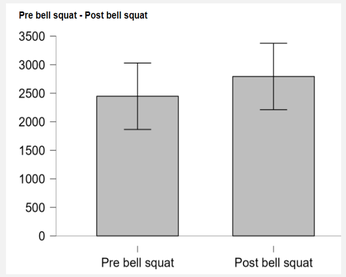
- Heart Rate
- Body Mass
- Ultrasound
- Biodex Balance Assessment
- Body Water Assessment
- Muscular Strength

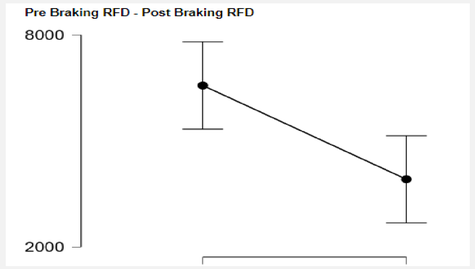


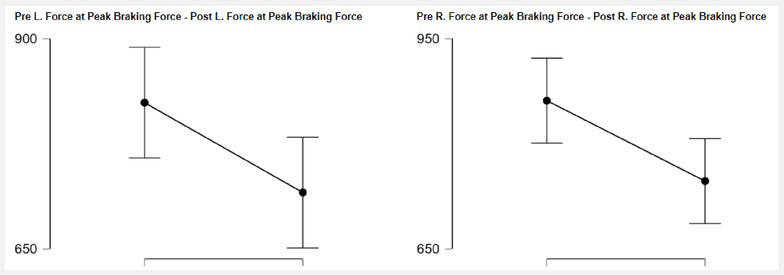
RESULTS

The only significant changes were observed in body fluids, braking force, and left/ right foot force at peak braking during countermovement jump testing.

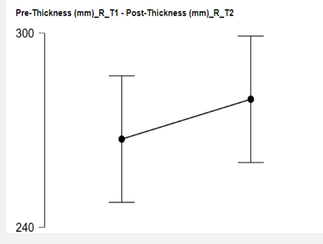
Bell Squats & Countermovement Jump (CMJ)

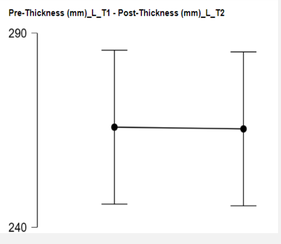






Vastus Lateralis Muscle Morphology





Bioelectrical Impedance (BIA)

	Pre-race mean ± SD	Post-race mean ± SD	P value
BMI	24.41 ± 1.27	24.12 ± 1.97	0.349
TBW%	61.30 ± 6.40	63.91 ± 3.70	0.164
ECF%	41.51 ± 2.53	43.15 ± 1.89	0.030
ICF%	58.50 ± 2.53	56.86 ± 1.89	0.030

CONCLUSION

- Body fluid increase was due to increase in plasma volume, which is very common in marathon distance runners (Knechtle et al. 2018).
- CMJ results showed significant changes in braking RDF
- (pre 6570.0 ± 4832.3, post 3914.7 ± 3036.9, p= 0.007).
- Significant changes observed during force at peak braking force:
  - left leg (pre 823.8 ± 154.6, post 716.9 ± 17.5, p= 0.029)
  - right leg (pre 816.5 ± 109.5, post 746.6 ± 148.5, p= 0.014).
- This change can possibly be attributed to the rocky terrain on which the race took place, as well as the shock observed running down hills.

- Ultra endurance trail runners are very diverse, and the location and the terrain that runners train on can have a huge impact on their performance.

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