

INTRODUCTION

- Ehlers-Danlos syndrome is a disorder that affects connective tissues [1]
 - Hypermobile Ehlers-Danlos Syndrome is the most common of 13 subtypes that primarily affects skin and joints [2]
- 1 in 5000 individuals have hEDS [3]
- Symptoms can include skin laxity, joint hypermobility, frequent dislocations and pain.
 - Can lead to abnormal gait, poor balance and osteoarthritis [4]
- Adults with hEDS have been found to have plantar pressure patterns that lead to pain and fatigue during gait [5]
- Limited studies on plantar pressure in children with hEDS

Goal:

Characterize plantar pressure in children with hEDS and compare it to healthy individuals.

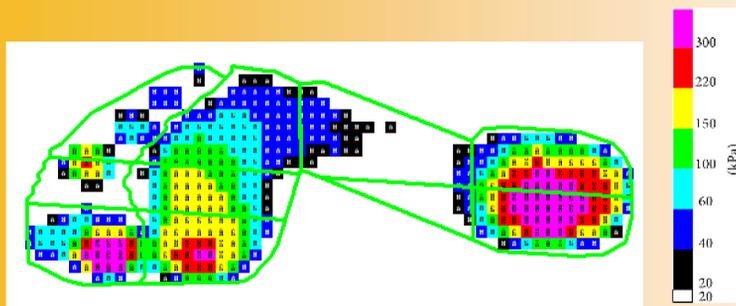


Figure 1: The PRC mask for a representative subject. Pink and red show higher pressure; blue and black are lower pressure (kPa), and green lines are region boundaries.

METHODS

- Eight human subjects ages 10-17 with hEDS.
 - 4 males, 4 females, all right foot dominant.
- 52 subjects in healthy control group
 - 18 males, 34 females, ages 21 ± 1.4 years
- Subjects walked at a self selected walking speed across the Novel Emed pressure platform.
 - Three - five trials were collected for each foot.
- The Peter Richard Cavanagh (PRC) mask was used to analyze foot regions (Fig. 1)
- Pressure, force, and contact area were calculated using the Emed software.
- Z - tests were used to compare to healthy control.

RESULTS

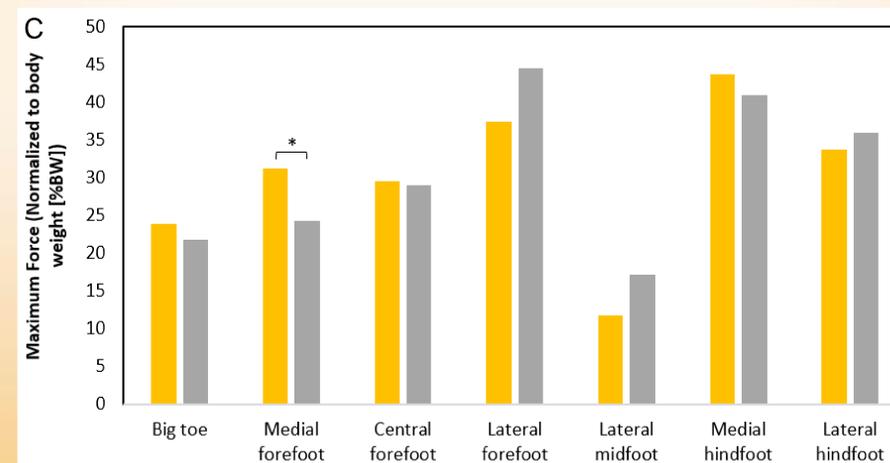
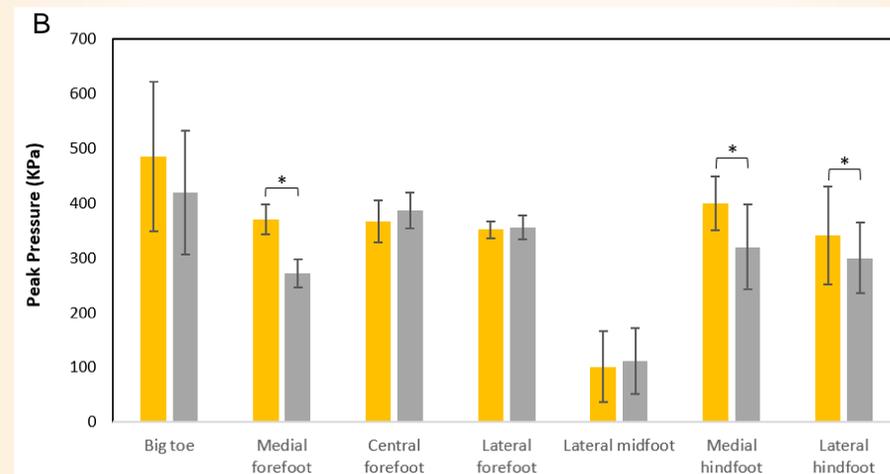
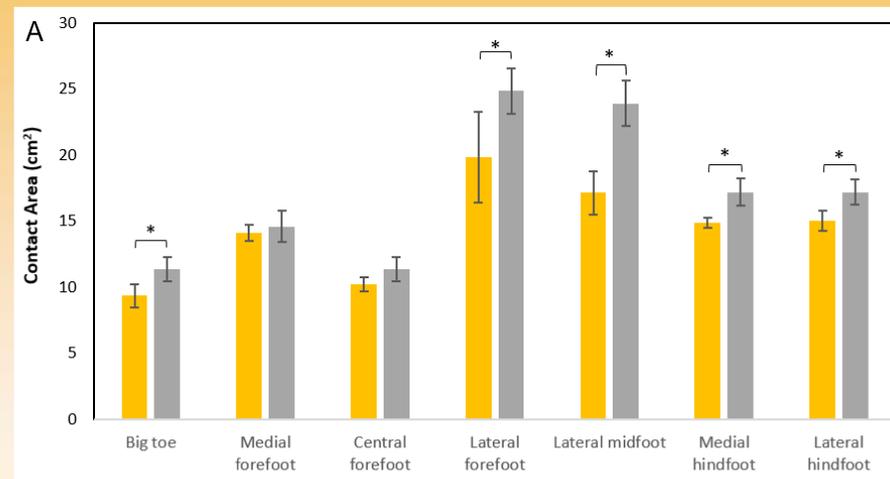


Figure 2: (A) Contact area, (B) Peak pressure, and (C) Maximum force were calculated during gait in eight children with hEDS (yellow bars; mean \pm standard deviation) and healthy children (gray bars; mean \pm standard deviation) on the dominant side. * indicates $p < 0.05$

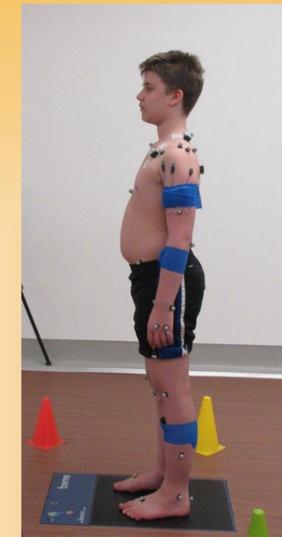


Figure 3: Subject performing static trial

DISCUSSION

- Statistically significant ($p < 0.05$) differences between children with hEDS and healthy young adults were found
- Key parameter differences were contact area and peak pressure (Fig.2)
 - 8/11 regions for contact area were significantly less.
 - 4/11 regions for peak pressure were significantly higher.
- Medial forefoot the only region shown to be different in maximum force.

CONCLUSIONS

- With less contact area and higher peak pressure, pain and balance issues could be caused from poorly distributed force [5].
- Therapeutic strategies should include a way to increase contact area to redistribute pressure.
- Studies need to be done with a larger pediatric sample size.

ACKNOWLEDGEMENTS

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REFERENCES

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