

## Introduction

- Individuals with autism spectrum disorder (ASD) are at higher risk for hip, forearm and spine fractures<sup>1</sup>
- Poor bone development during childhood may explain the elevated risk of fracture in individuals with ASD<sup>1</sup>
- Previous studies reported 13-30% lower areal bone mineral density (aBMD) for total body, lumbar spine, hip and femoral neck measures in children with ASD when compared to typically developing (TD) children<sup>2-3</sup> while aBMD changes were comparable<sup>2</sup>
- The literature has limited evidence of bone mass, structure and estimated strength development in children with ASD

## Objective

- Our objective was to compare 1-year change in radius and tibia bone mass, structure and estimated strength between children with ASD and their TD controls

## Methods

- **Participants**
  - 13 children with ASD (12 boys) (mean age 10.2, SD 2.8 yrs)
  - 32 TD children (15 boys) (10.7, 1.7 yrs)<sup>4</sup>
- **Measurements and outcomes**
  - We scanned the distal and shaft sites of the radius and tibia at baseline and after one year using peripheral quantitative computed tomography (pQCT)<sup>5</sup>
- **Statistical Analysis**
  - We normalized follow-up bone outcomes to 1-year change. We used repeated measures MANOVA (following by pairwise comparison) to compare 1-year changes between the groups.

## Results

- There was a significant main effect of the group (Wilks' Lambda = 0.413, F (1, 35) = 2.233, p=0.044)
- No interaction between group × time (Wilks' Lambda = 0.643, F (1, 35) = 0.871, p>0.05)

## Results

- Total area, cortical area, cortical content and estimated bone strength in radius and tibia shaft were 17-33% lower in children with ASD when compared to TD children. There was no difference at distal sites

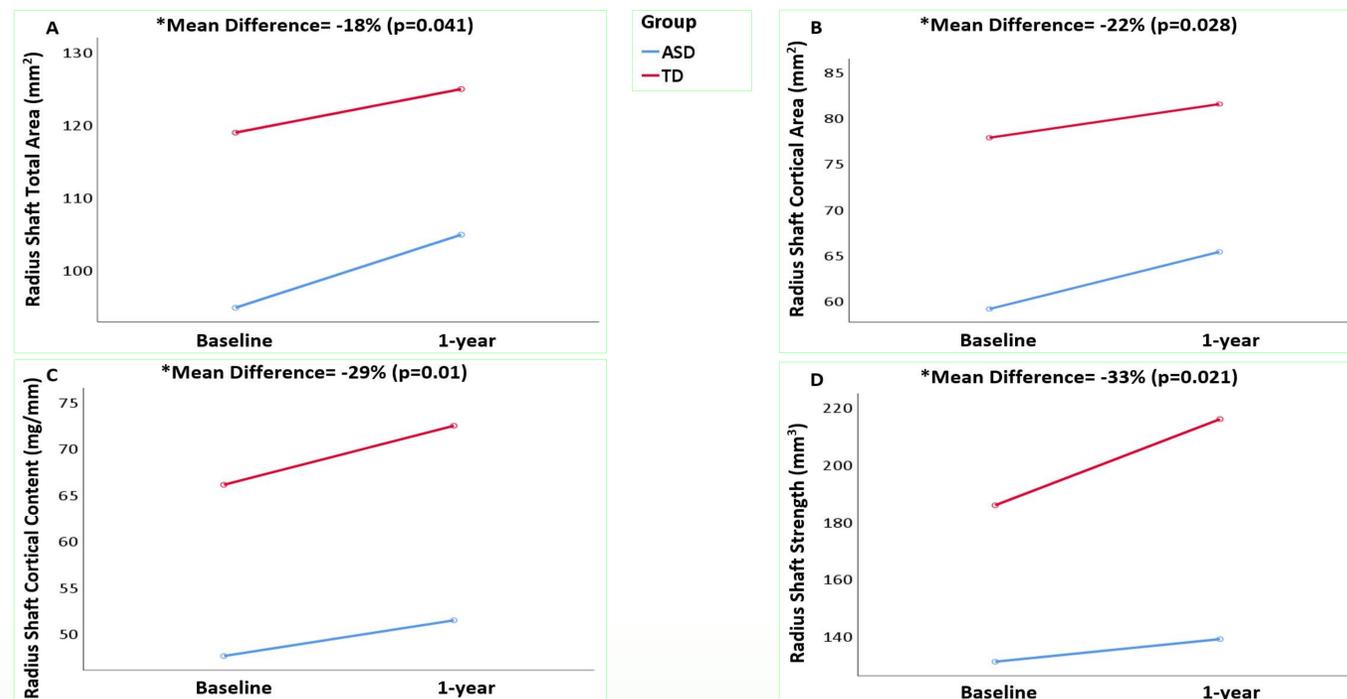


Figure 1. Change in (A) total area, (B) cortical area, (C) cortical content and (D) estimated bone strength in radius shaft in both groups and difference in estimated marginal mean\*

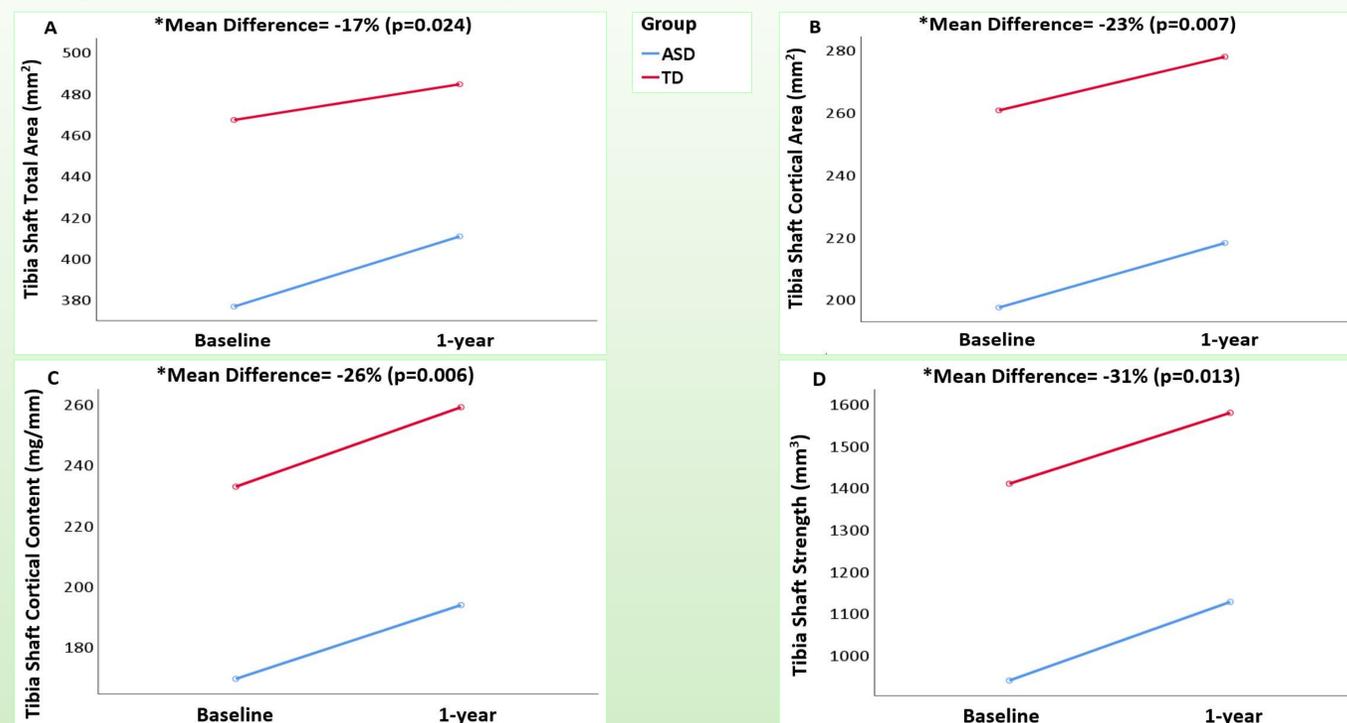


Figure 2. Change in (A) total area, (B) cortical area, (C) cortical content and (D) estimated bone strength in tibia shaft in both groups and difference in estimated marginal mean\*

## Discussion

- Although children with ASD sustained 17-33% deficits, particularly in cortical bone size and mass at radius and tibia shafts, the one year annual changes did not differ from TD children
- This preliminary findings add to the reported of lower spine and hip aBMD z-scores in boys with ASD when compared to controls at 4-year follow-up<sup>2</sup>
- Future studies need to include younger children with ASD and identify factors underpinning bone deficits as well as develop therapeutic interventions to optimize skeletal health in children with ASD

## Conclusion

- Observed 17-33% deficits in bone mass, structure and strength at radius and tibia shafts in children with ASD were sustained over 1-year follow-up

## Acknowledgements

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## References

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