

Accelerometry-Based Characteristics Associated with Aggressive Behavior in Children with ADHD

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OBJECTIVE: To learn about what characteristics of physical activity may herald aggressive outbursts

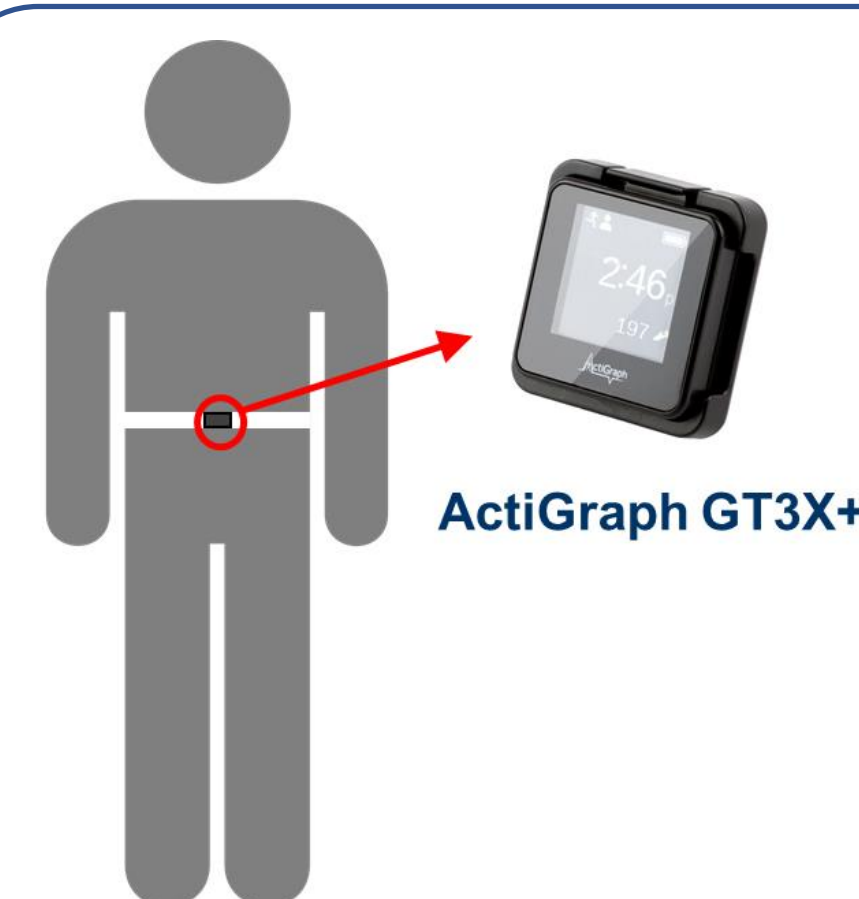
INTRODUCTION

- Children with attention deficit hyperactivity disorder (ADHD) often display aggression [1, 2].
- Ascertaining aggressive episodes in an objective manner reduces the need for relying on informants and maximizes the opportunity to evaluate the efficacy of targeted interventions.
- This study sought to examine whether characteristics of physical activity (PA), quantified using a wearable sensor, can reliably predict aggressive behavior in children with ADHD.

MATERIALS & METHODS

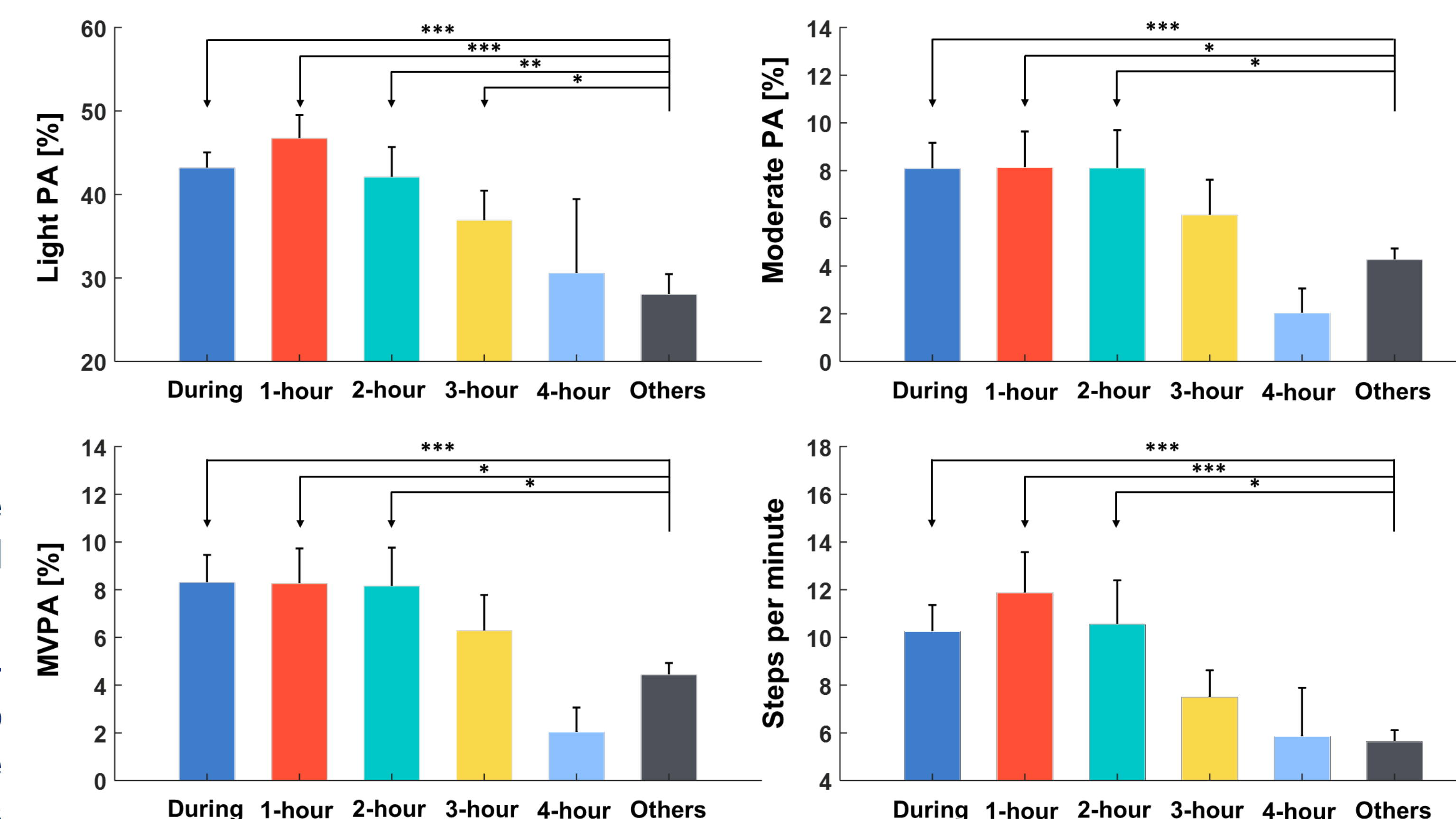
- Children diagnosed with ADHD (n=11, age: 8.5 ± 1.0 yrs, 27% female, BMI: 16.7 ± 1.5 kg/m²) participated.
- A wearable sensor (GT3X+, ActiGraph Corp., Pensacola, USA) attached to the waist was used to remotely monitor PA continuously, for 7 days.
- Parents completed the Retrospective-Modified Overt Aggression Scale [3]. Four PA variables, including light PA (%), moderate PA (%), MVPA (%) (i.e., averaged sum of moderate and vigorous PA), and steps per minute were extracted from the wearable sensor.
- We compared PA level during the hour when an aggressive episode occurred and at 1-hr, 2-hr, 3-hr, and 4-hr before the aggressive episode to PA level during hours before the 4-hr measurement point. All PA variables were assessed statistically using generalized estimating equations analysis.

RESULTS & FINDINGS



	Participants with ADHD (n=11)	
	mean ± std	median (quartiles)
Age, years	8.50 ± 0.98	8.6 (7.5/9.0)
Female, n (%)	3 (27.3)	-
Outbursts, n	6.3 ± 7.3	4 (2/7)
Recording days	7.7 ± 1.4	8.0 (8.0/8.0)

- All participants exhibited aggressive outbursts at least once
- All PA variables were significantly higher during the aggressive outbursts compared to other times when no aggression occurred (p<0.0001).
- Multiple pairwise comparisons revealed that all PA variables at 1-hr and 2-hr prior to the aggressive outbursts were also significantly higher compared to times outside the aggressive outbursts but they were not different from times when an outbursts was occurring.



DISCUSSION & CONCLUSION

- Our data suggest that tracking PA variables may enable identifying an aggressive outbursts with a 2-hour lead time.
- Future studies are needed to further validate these findings and examine their potential to optimize aggression treatment.

REFERENCES & ACKNOWLEDGEMENT

- Jensen et al. Journal of the American Academy of Child and Adolescent Psychiatry (2007).
 - Zahrt and Melzer-Lange. Pediatrics in Review (2011).
 - Blader et al. Journal of the American Academy of Child and Adolescent Psychiatry (2021).
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