

# Effectiveness of Defocus Incorporated Multiple Segments (DIMS) spectacle lenses on myopia control in Romanian children: 1-year results

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## Background

- Defocus Incorporated Multiple Segments (DIMS) spectacle lenses have a proven efficacy in reducing myopia progression when compared to their peers in conventional single vision spectacle lenses in different populations.
- Scarcity of evidence on the effectiveness of DIMS spectacle lenses in Romania
- Purpose:** One year single-centre observational study to report on the effectiveness of DIMS spectacle lenses in Romanian children.

## Methods

- Inclusion Criteria:**
  - Children aged 4-15 years
  - No history of myopia control
- Initial cycloplegic refraction:**
  - Spherical Equivalent Refraction (SER) -0.50 to -8.50D,
  - Astigmatism  $\leq 2.50$ DC
- Children received treatment between 2021-2024 in one healthcare center.
- SER and axial length (AL) were measured at baseline, 6M and 12M using Topcon KR 800 autorefractor and Pentacam AXL, respectively.
- If axial elongation at 6M was similar to non-treated age-matched myopes, 0.025% Atropine was added for consenting patients.
- Participants were evaluated based on their baseline age: <8 years, 8-10 years, 11-13 years, and 14-15 years.
- Progression was analysed by comparing with physiological axial elongation of emmetropes of the same age (Table 1).

Table 1. Classification of progression by age group

Age group	Small	Medium	High
7-10 years	<0.2	0.2-0.3	>0.3
11-15 years	<0.1	0.1-0.2	>0.2

- Data from both eyes were analysed. The statistical unit was the eye.

## Participant Characteristics

- Caucasian ethnicity
- 122 eligible children (58% female), 4 patients lost to follow-up at 6M
- 108 children (39% boys, 61% girls) wore DIMS spectacle lenses only for 12M (group A)
- 12 children had progression greater than age-matched myopes. Of these, 10 children consented to combination treatment (DIMS + 0.025% Atropine, Group B) and 2 patients remained in Group A

## Acknowledgments

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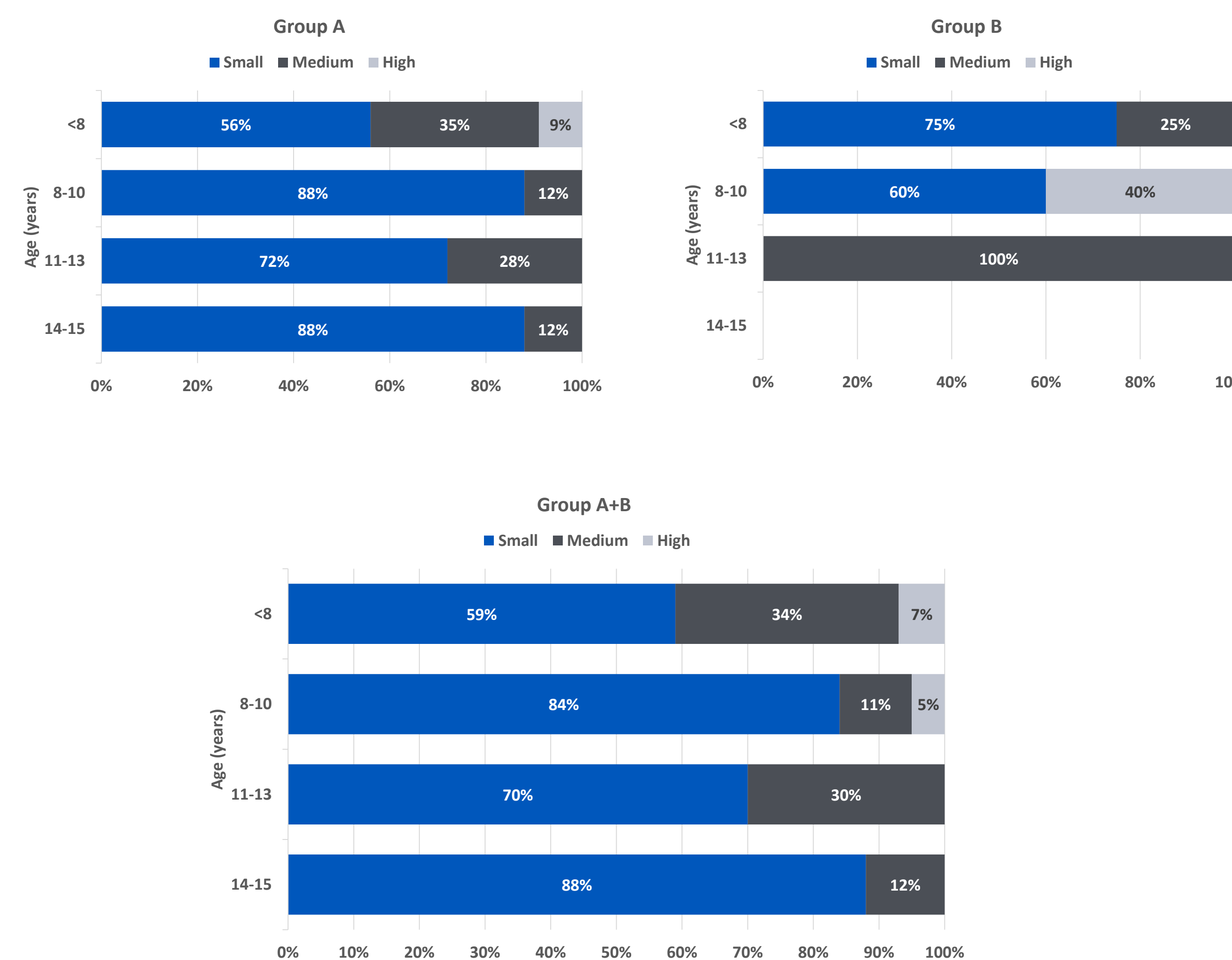
## Results

- Mean age (118 children) was  $10.3 \pm 2.7$  years
  - 22.9% younger than 8 years
  - 34.7% 8-10 years
  - 35.6% 11-13 years
  - 6.8% 14-16 years
- The results are summarized in Table 2 and Figure 1.

Table 2. Summary and comparison of SER and AL by group

	SER (D)			AL (mm)		
	Baseline	Progression 6M	Progression 12M	Baseline	Progression 6M	Progression 12M
Full cohort	$-2.36 \pm 1.68$	$0.13 \pm 0.22$ (p<0.001)	$0.24 \pm 0.23$ (p<0.001)	$24.23 \pm 0.93$	$0.03 \pm 0.08$ (p<0.001)	$0.09 \pm 0.12$ (p<0.001)
Group A (DIMS)	$-2.43 \pm 1.71$	$0.09 \pm 0.20$ (p<0.001)	$0.22 \pm 0.22$ (p<0.001)	$24.24 \pm 0.93$	$0.02 \pm 0.07$ (p<0.001)	$0.09 \pm 0.11$ (p<0.001)
Group B (DIMS + A0.025%)	$-1.56 \pm 0.99$	$0.19 \pm 0.23$ (p=0.043)	$0.32 \pm 0.25$ (p=0.043)	$24.19 \pm 0.88$	$0.14 \pm 0.09$ (p=0.409)	$0.18 \pm 0.13$ (p=0.409)

Figure 1. AL progression by group and age



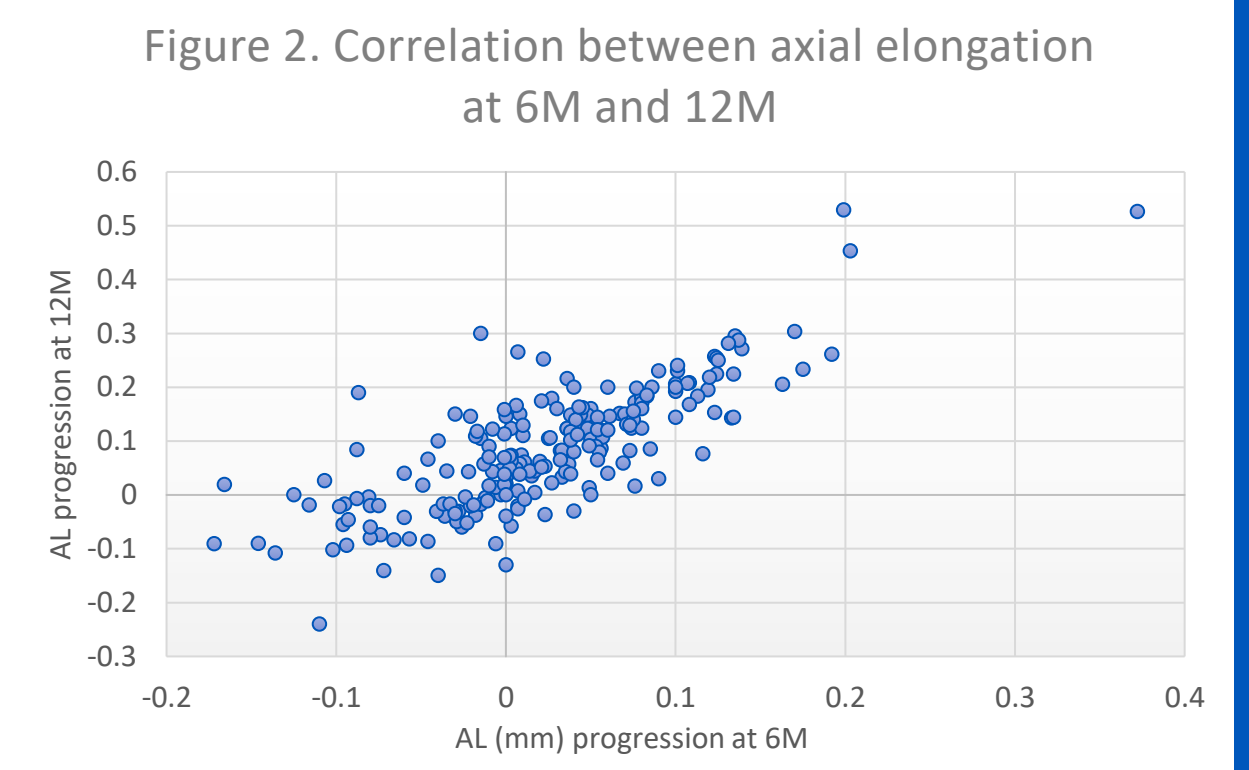
- At 12M, 75% of boys and 73% of girls had an axial elongation equal to the emmetropes of their age.

## References

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- Nucci P, Lembo A, Schiavetti I, Shah R, Edgar DF, Evans BJW. A comparison of myopia control in European children and adolescents with defocus incorporated multiple segments (DIMS) spectacles, atropine, and combined DIMS/atropine. *PLoS One.* 2023 Feb 16;18(2): e0281816

## Results

- Axial elongation at 12M was significantly correlated with that at 6M (7-10y & 11-15y p<0.001) but not with initial AL (7-10 y: p=0.458; 11-15 y: p=0.251) or with initial refraction (7-10 y: p=0.146; 11-15 y: p=0.378).



## Discussion

- Real-world clinical data from a practice
- 90% of children wearing DIMS spectacle lenses recorded refraction changes less than -0.50D after 1 year.
- The correlation between AL progression in the first 6 months and the subsequent progression at 12 months<sup>1</sup> supports a change in myopia management strategy after 6 months in cases where progression is fast.
- Combination treatment (DIMS + Atropine) has proven effectiveness in a European population.<sup>2</sup>
- 80% (8/10) of children on combination treatment (DIMS + 0.025% Atropine) in the present study had lower progression than age-matched myopes without treatment.
- All data including those cases where the treatment was changed and differences are not statistically significant, have been presented.
- Using the above approach, the overall success rate for the whole cohort (axial elongation less than age-matched myopes) was 97%.

## Conclusions

- DIMS spectacle lenses are effective in slowing myopia progression (SER and AL) in Romanian children at 12M.
- As AL progression at 6M is positively correlated with the 12M progression, it can be used as guide for changes in myopia management strategies, if there is progression at 6M.
- Further longer-term studies are required for Romanian children wearing DIMS spectacle lenses.



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