

A Systematic Review and Meta-Analysis of Language Abilities in Preschool Children with Critical Congenital Heart Disease

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INTRODUCTION

Children with critical congenital heart disease (cCHD) are at increased risk for neurodevelopmental delays/impairments, including language delays

Language abilities are essential for social connection, academic performance and functioning in daily life¹

Most studies have concentrated on motor, cognitive or overall neurodevelopmental outcomes of children with cCHD.

AIM

We aimed to complete a systematic review and meta-analysis, to determine the language abilities of preschool children with cCHD, including a comparison of language outcomes between those with univentricular and biventricular CHD.



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2. Sterne J, Savović J, Page M, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*. 2019;366:14898.
3. Sterne JA, Hernán MA, Reeves BC, et al. ROBINS-I: A tool for assessing risk of bias in non-randomised studies of interventions. *BMJ*. 2016;355:1-7. doi:10.1136/bmj.i4919
4. The Cochrane Collaboration. *Review Manager (RevMan)*. 2020.

METHODS

Search Strategy

Literature search (January 1990-July 1, 2021) Databases: Medline, EMBASE, SCOPUS, Child Development and Adolescent Studies, ERIC, PsycINFO, and CINAHL.

Inclusion criteria:

Children ≤5 years of age with cCHD and CPB or catheter-based intervention in 1st year of life. Standardized, validated language assessment expressly stating Expressive and Receptive language outcome

Study selection

Two reviewers independently screened articles by title abstract and subsequently a full-text screen was completed. Any discrepancies were resolved by a 3rd reviewer.

Data extraction was performed independently by two reviewers and reviewed together to resolve any discrepancies.

Quality Assessment

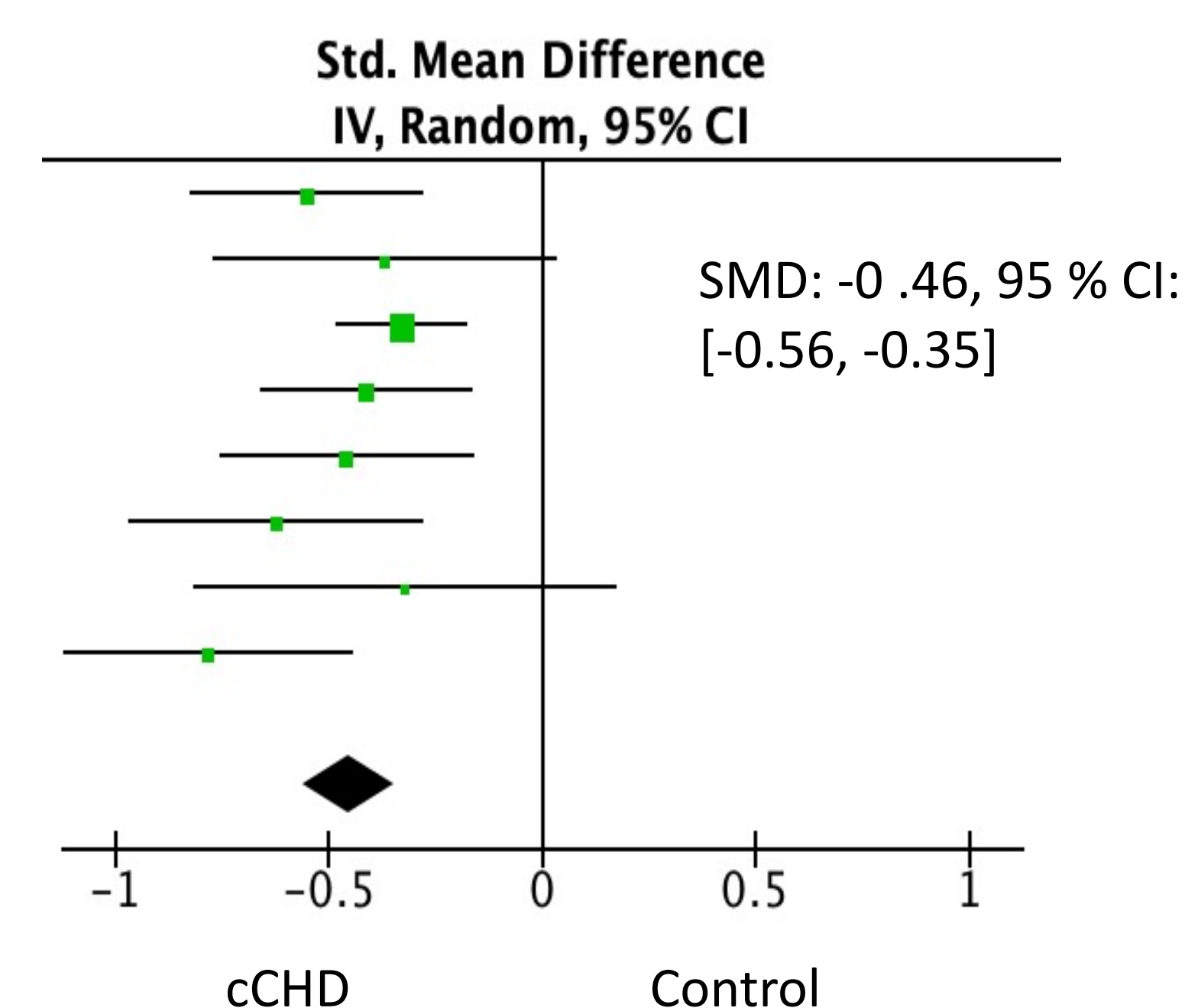
Revised Cochrane Risk-of-Bias tool for randomized trials (RoB2)² and Risk Of Bias In Non-randomized Studies – of Interventions (ROBINS-I)³ assessment tool and template for observational studies

Statistical Analyses

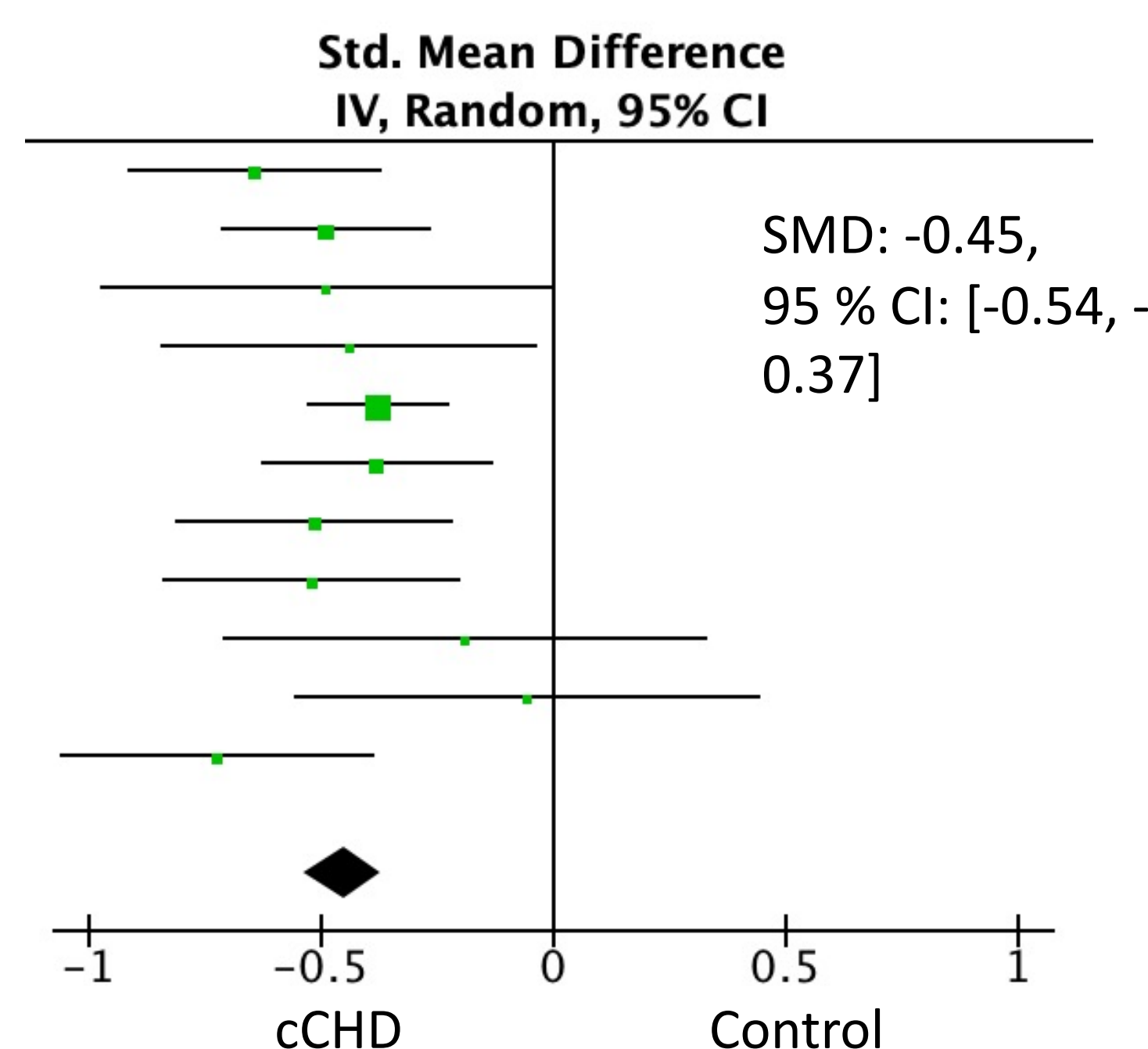
When individual study results provided the mean and SD and it was appropriate, *Review Manager*⁴ software (version 5.4) was used to pool the study results into a standardized mean difference for overall, expressive, and receptive language outcomes. For studies reporting the median and either interquartile range or range, the results were described narratively.

RESULTS

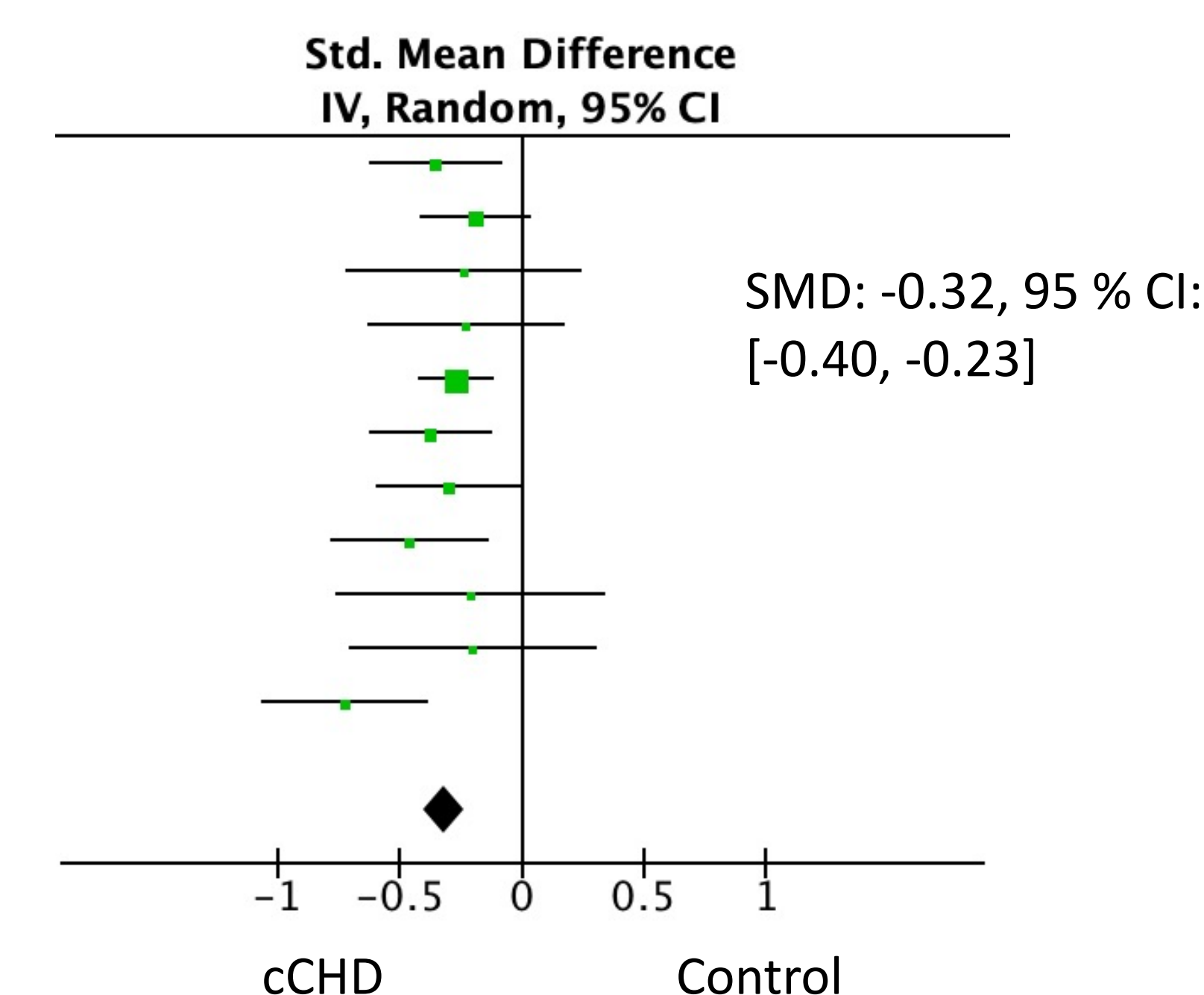
Overall language



Expressive language



Receptive language



DISCUSSION

Language outcomes of children with cCHD are within one standard deviation of their peers, but are statistically significantly lower.

Cognitive and motor domain overviews match our language findings.

Findings match guidelines to test early, often and refer early to language specific supports

Few articles looked at expressive and receptive language, children at 4-5 years of age and comparing univentricular and biventricular cCHD. However, the few articles discussing univentricular and biventricular cCHD found children with univentricular cCHD had worse language outcomes than biventricular.

CONCLUSION

This is the first synthesis of literature in expressive and receptive language outcomes for preschool children with cCHD, filling a gap within the literature.

Children with cCHD have significant deficits in language when compared to the general population in overall, expressive, and receptive language, with expressive language as a particular area of concern.

This review serves as the background for future plans within our own group to determine an objective, direct measure of language in preschool children with cCHD.

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