

QTc Prolongation and Electrocardiogram Abnormalities Caused by ADHD Medications Amongst Paediatric Population.

A Systematic Review and Meta-Analysis.

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Introduction

• Acknowledging the heightened cardiovascular risk posed by ADHD medications, American Heart Association made a recommendation for the use of pre-treatment ECG screening in April 2008 (1). In fact, The US Food and Drug Administration almost placed a black box warning on the clinical use of ADHD medications (2).

• However, the American Academy of Paediatrics and the American Academy of Child and Adolescent Psychiatry both released a joint statement against the recommendation (3).

Aim

To study the prevalence of QTc prolongation and ECG abnormalities posed by ADHD medications and explore the relevance of pre-treatment cardiovascular screening amongst children.

Methods

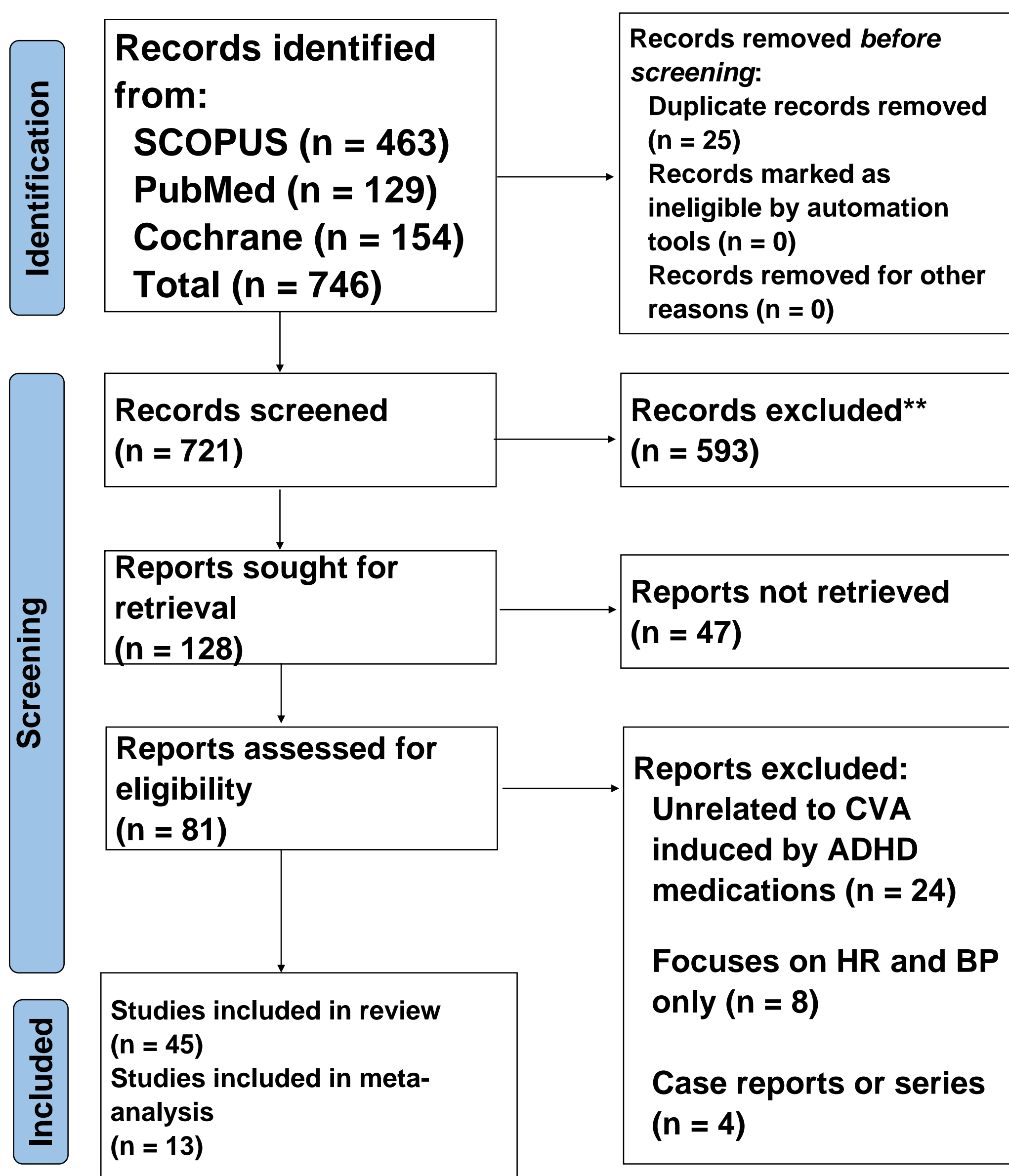


Figure 1: PRISMA Flow Chart

Discussion

Lamberti et al. and Karpuz et al. have reported the superiority of TpTe interval, TpTe dispersion, and TpTe/QT ratio to QT interval in predicting ventricular arrhythmias in the event of immeasurable QT interval.

Acknowledging the antagonistic effect of GUAN and MPH, Sayer et al. and Spencer et al.'s findings supported the utilization of combination treatment to keep patients' hemodynamic profiles at their baselines

Despite majority of the studies supporting the use of pre-treatment ECG, Leslie et al. outlined the irrelevance of screening at the age of 8 years due to incomplete phenotypic expression of hypertrophic cardiomyopathy (HCM).

Results

Figure 2: Summarised Result

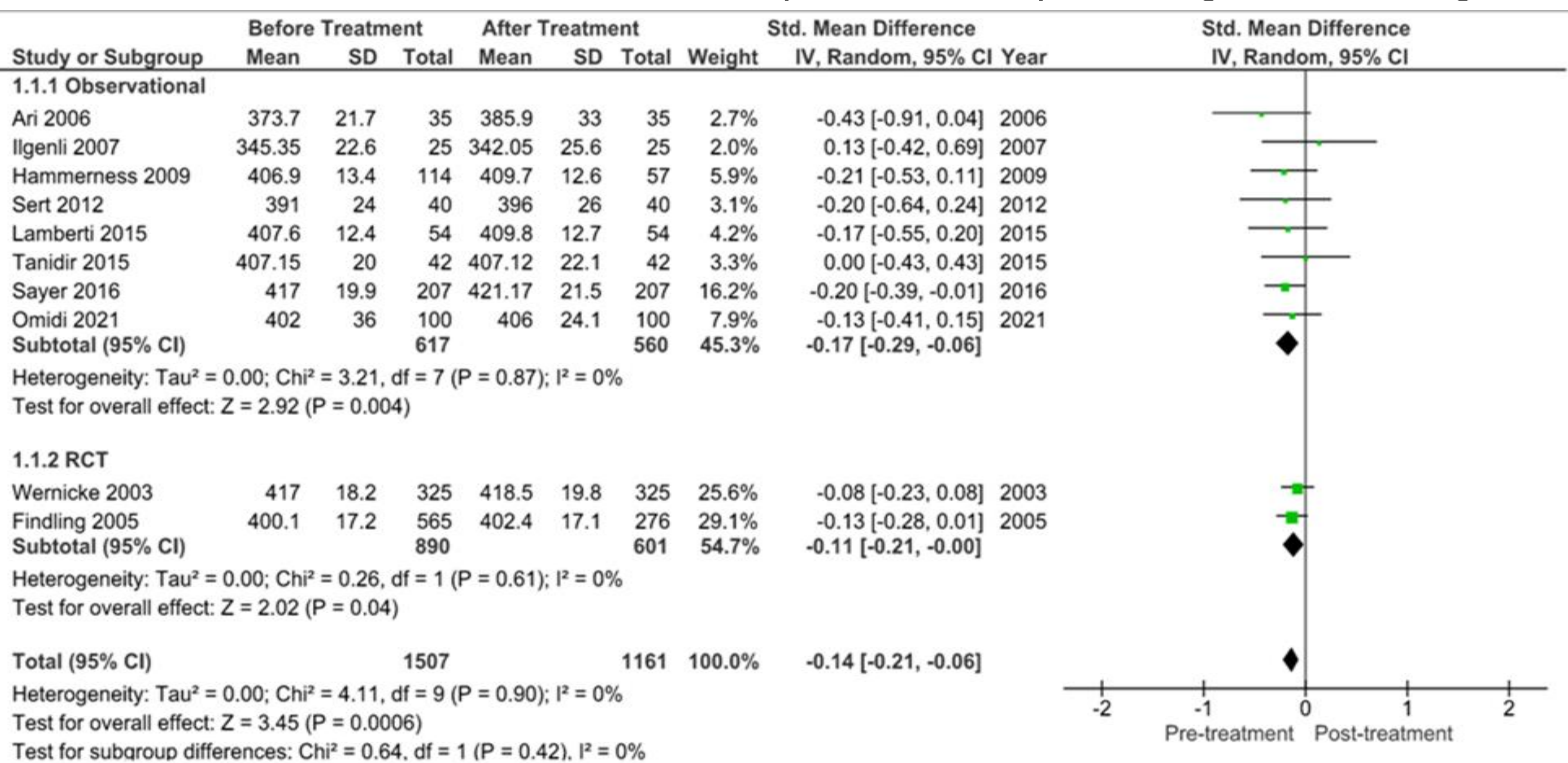
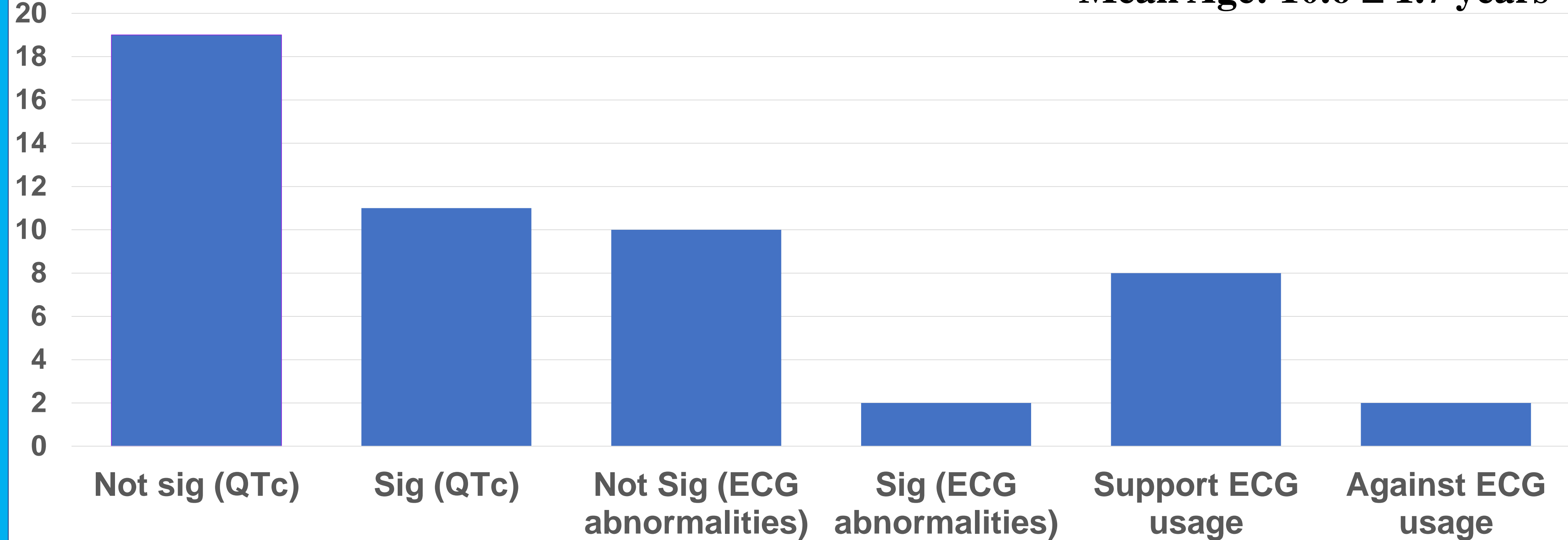


Figure 3: Meta-Analysis

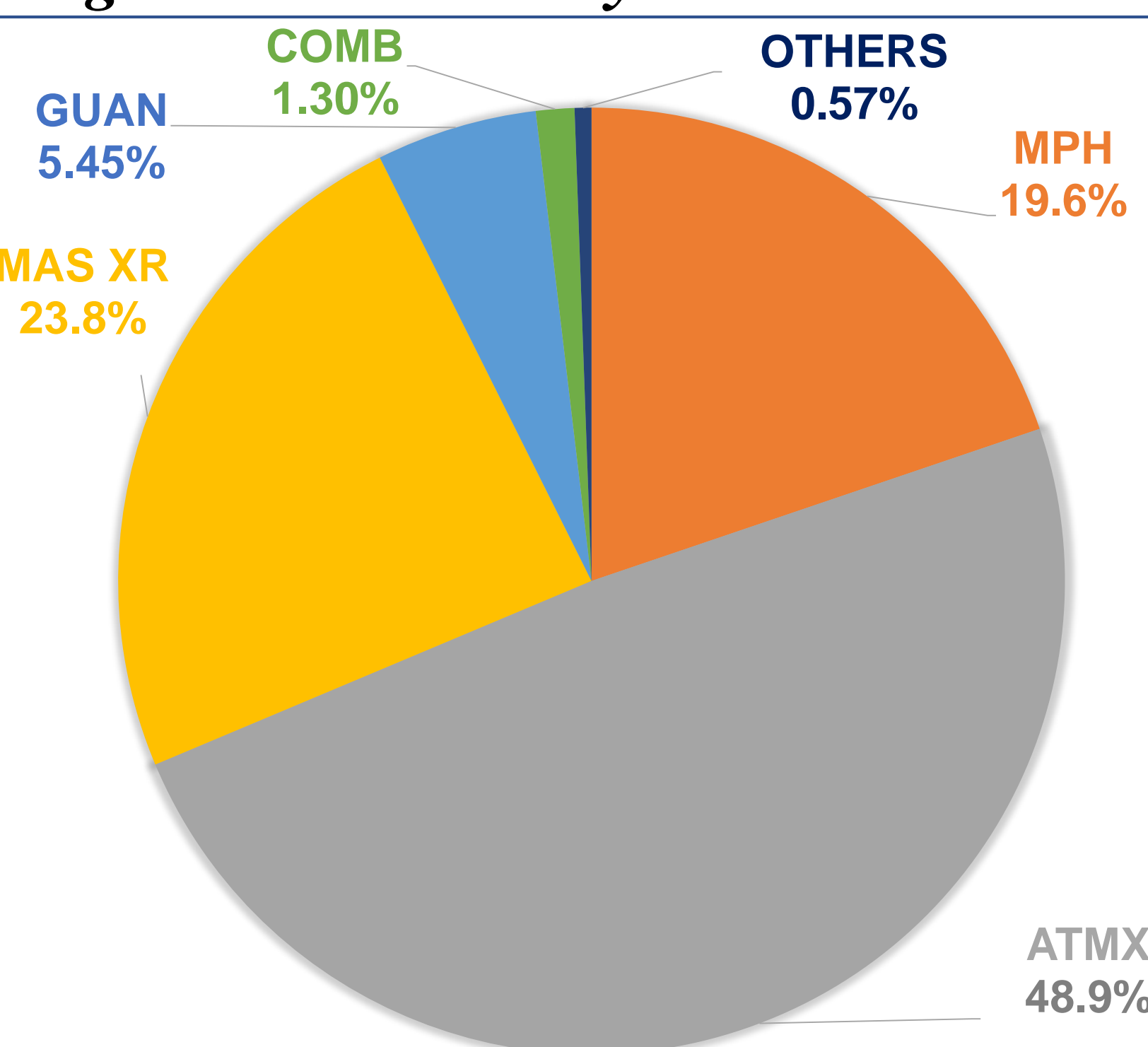


Figure 4: Types of Medications

Take Home Numbers

- **0.59%**: Prevalence of QTc Prolongation after ADHD treatment
- **3.34%**: Prevalence of arrhythmia after ADHD treatment
- **1.90%**: Prevalence of conduction disorders after ADHD treatment
- **1.39%**: Prevalence of other ECG disorders after ADHD treatment

Conclusion

- ADHD medications are clinically safe for paediatric patients in terms of cardiovascular risk.
- Our t-test and meta-analysis depicted no statistical significance or any association between QTc prolongation and the use of ADHD medication.
- The percentage of ADHD medication-induced ECG abnormalities and QTc prolongation are low.
- Whether pre-treatment ECG screening should be incorporated, more research is required to determine its efficacy over the cost.

References

1. American Academy of Pediatrics/American Heart Association clarification of statement on cardiovascular evaluation and monitoring of children and adolescents with heart disease receiving medications for ADHD: May 16, 2008. J Dev Behav Pediatr. 2008;29(4):335
2. Sayer GR, McGough JJ, Levitt J, Cowen J, Sturm A, Castelo E, et al. Acute and Long-Term Cardiovascular Effects of Stimulant, Guanfacine, and Combination Therapy for Attention-Deficit/Hyperactivity Disorder. J Child Adolesc Psychopharmacol. 2016;26(10):882-8.
3. Perrin JM, Friedman RA, Knilans TK. Cardiovascular monitoring and stimulant drugs for attention-deficit/hyperactivity disorder. Pediatrics. 2008;122(2):451..