

# Phosphodiesterase-5 Inhibitors in Heart Failure with Preserved Ejection Fraction: A Systematic Review and Meta-analysis

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## Background

Heart failure with preserved ejection fraction (HFpEF) results from a complex interplay of various risk factors. Patients with HFpEF have shown reduced cGMP (cyclic Guanosine 3',5'-Monophosphate) levels relative to those with HF with reduced ejection fraction (HFrEF). Phosphodiesterase -5 inhibitors (PDE5i) are thought to play a cardioprotective role by potentiating the cGMP pathway.

## Objective

To study the effect of PDE5i on oxygen consumption (peak VO<sub>2</sub>), six-minute walk distance (6MWD), mitral annular E/e' ratio, left ventricular ejection fraction (LVEF), mean pulmonary artery pressure (mPAP), pulmonary artery systolic pressure (PASP), and pulmonary vascular resistance (PVR).

## Methods

An electronic database search was conducted for Randomized Controlled Trials (RCTs) published in English language prior to February 2021. Random effect model using RevMan (version 5.4) was used for data synthesis. The Cochrane risk of bias tool was used to assess bias in included studies.

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## Figures 1-6: Forest Plots

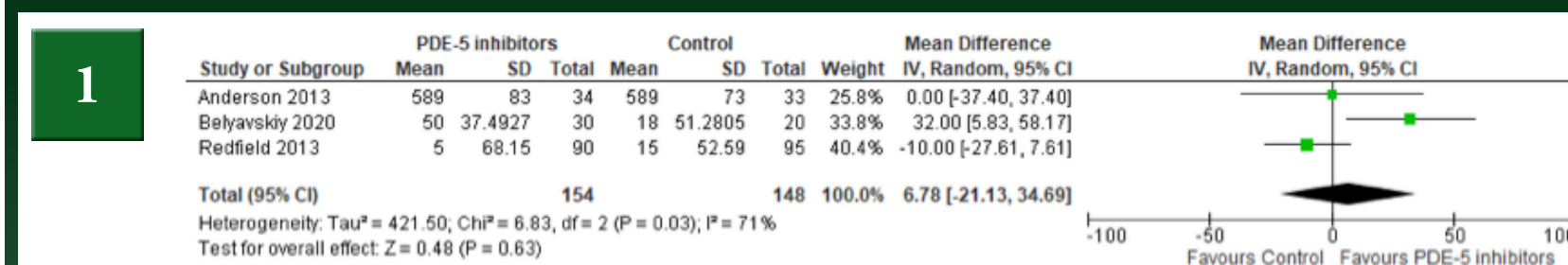


Figure 1: Forest plot showing comparison of 6MWD between PDE-5i and control.

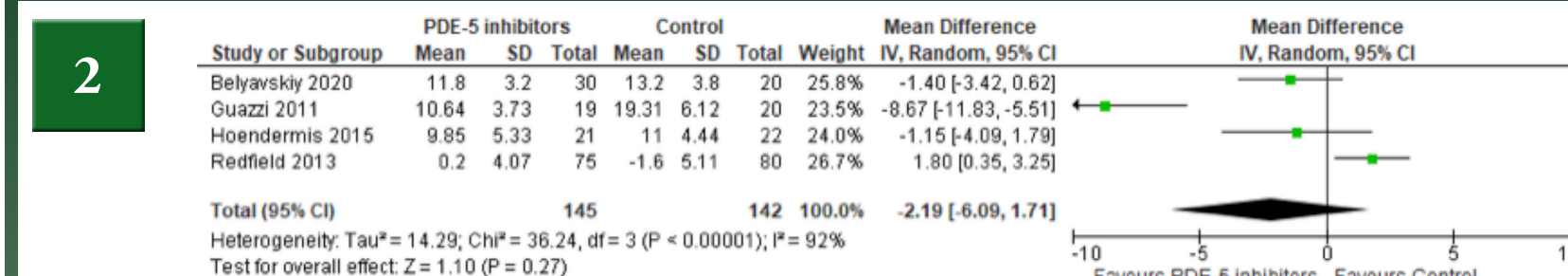


Figure 2: Forest plot showing comparison of Mitral annular E/e' ratio between PDE-5 inhibitors and control.

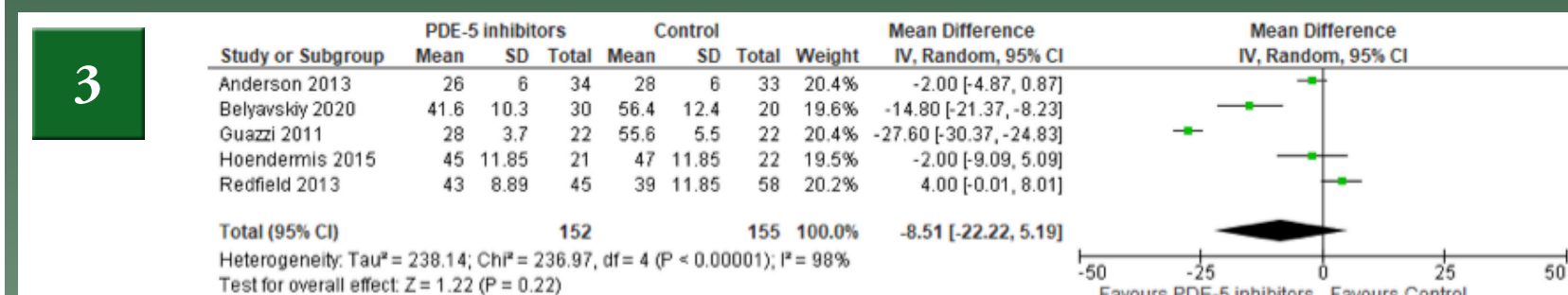


Figure 3: Forest plot showing comparison of PASP between PDE-5i and control.

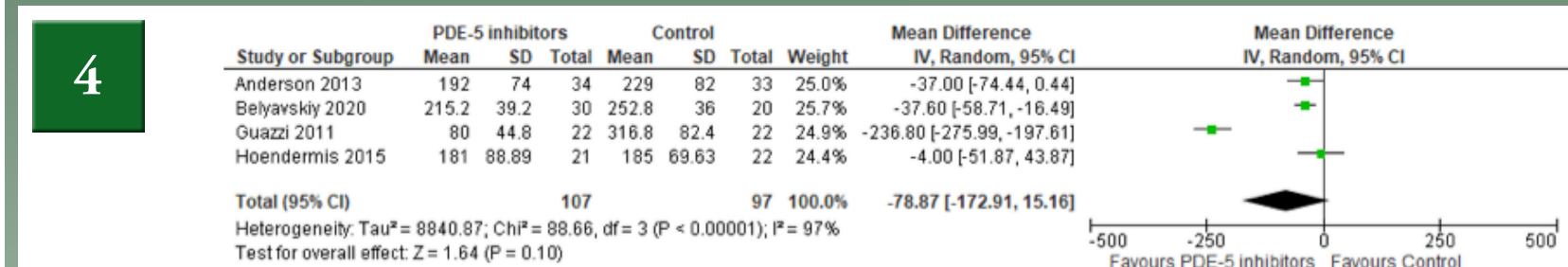


Figure 4: Forest plot showing comparison of PVR between PDE-5i and control.

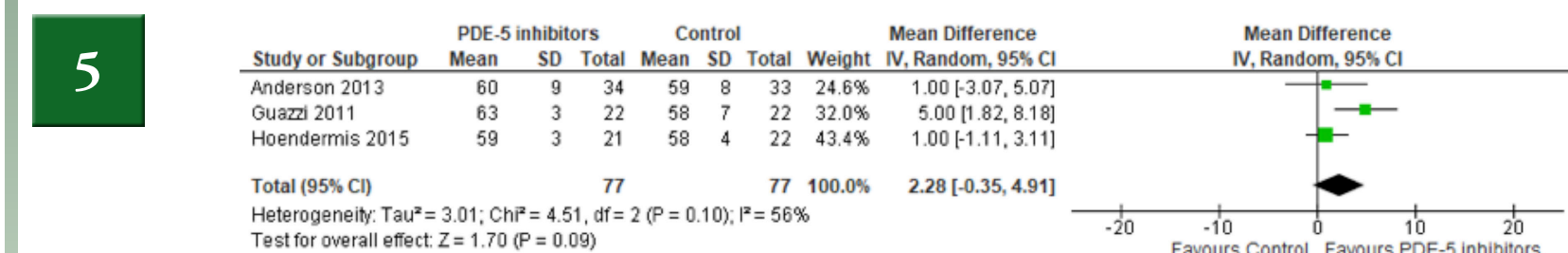


Figure 5: Forest plot showing comparison of LVEF between PDE-5i and control.

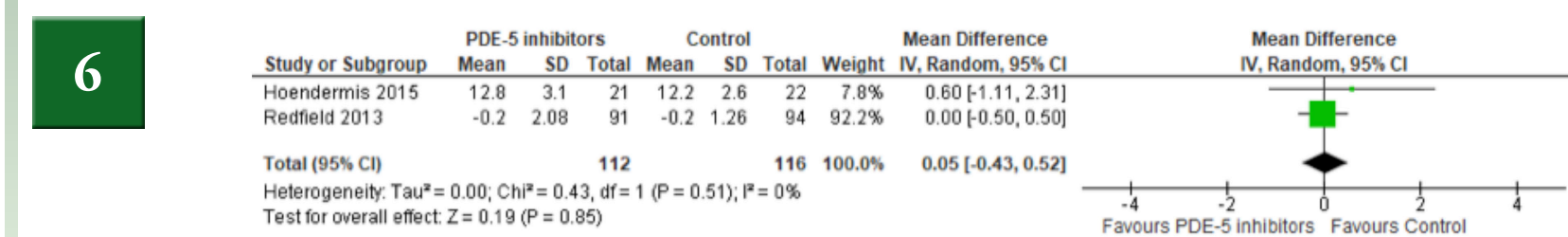


Figure 6: Forest plot showing comparison of peak VO<sub>2</sub> between PDE-5i and control.

## Results

The pooled data from four RCTs showed that there were no statistically significant differences in peak VO<sub>2</sub> (Mean Difference (MD) = 0.05 ml/kg/min, 95% Confidence Interval (C.I.): -0.43, 0.52; p = 0.85), 6MWD: MD = 6.78 meters, C.I. = -21.13, 34.69; p = 0.63), mitral annular E/e' ratio (MD = -2.19; 95% C.I. = -6.09, 1.71; p = 0.27), LVEF (MD = 2.28, C.I. = -0.35, 4.91; p = 0.09), mPAP (MD = -5.79 mm Hg (95% C.I. = -19.02, 7.43; p = 0.39), PASP (MD = -8.51 mm Hg, C.I. = -22.22, 5.19; p = 0.22), PVR (MD = 78.87 dynes/sec/cm-5, 95% C.I. = -172.91, 15.16; p = 0.10) with use of PDE-5i compared to control.

## Conclusion

Our findings show that PDE5i did not statistically significantly change study outcomes in HFpEF. However, patients with pulmonary hypertension-left heart disease had improved pulmonary hemodynamics parameters.

## References

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