Do DPP-4 inhibitors differ in efficacy between patients of Asians and White ethnicity? A systematic review and meta-analysis

Sushrima Gan[1], Adem Y Dawed[1] , Anand Nair[1], Louise Donnelly[1] , RM Anjana[2], V Mohan[2], Ewan R Pearson[1]
[1]School of Medicine, University of Dundee,
[2]Madras Diabetes Research Foundation, Chennai, India

Introduction

One of the greatest threats of the century to the health of mankind is Type 2 diabetes mellitus(T2D). The pharmacodynamics and pharmacokinetics of specific oral hypoglycaemic agents (OHA)s can be different among different ethnic groups.

Dipeptidyl Peptidase 4 (DPP-4) inhibitors are commonly used OHAs to treat Type 2 diabetes. Previous reports have suggested contradictory findings in their efficacy, when comparing Asian with White populations. We aimed to evaluate the efficacy of Dipeptidyl Peptidase 4 (DPP-4) inhibitors in different ethnic groups.

Methods

A literature search was conducted in PubMed for studies published from the period January 2006 to March 2019, by two independent investigators. Randomised controlled trials with atleast 50 patients in each arm and treatment duration nearest to 24 weeks were selected. These trials assessed the efficacy of a DPP-4 inhibitor versus placebo on HbA1c level in T2D patients. Studies which were focused on patients with adverse health conditions were rejected.

Outcome variable was the absolute change in HbA1c from baseline to the last available follow up measure. A systematic review and meta-analysis was conducted.

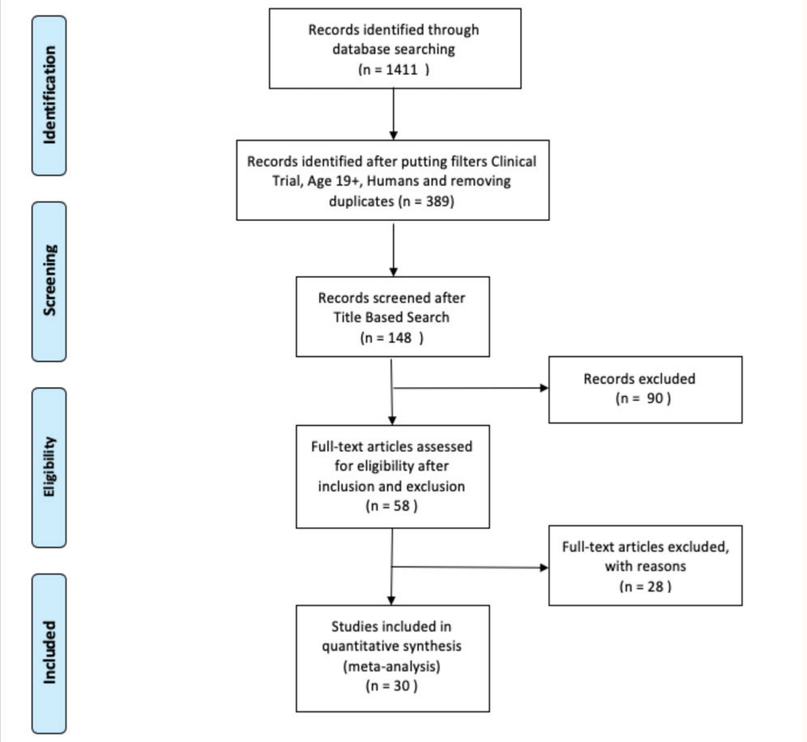

Figure 1 : Prisma Flowchart showing the study selection procedure

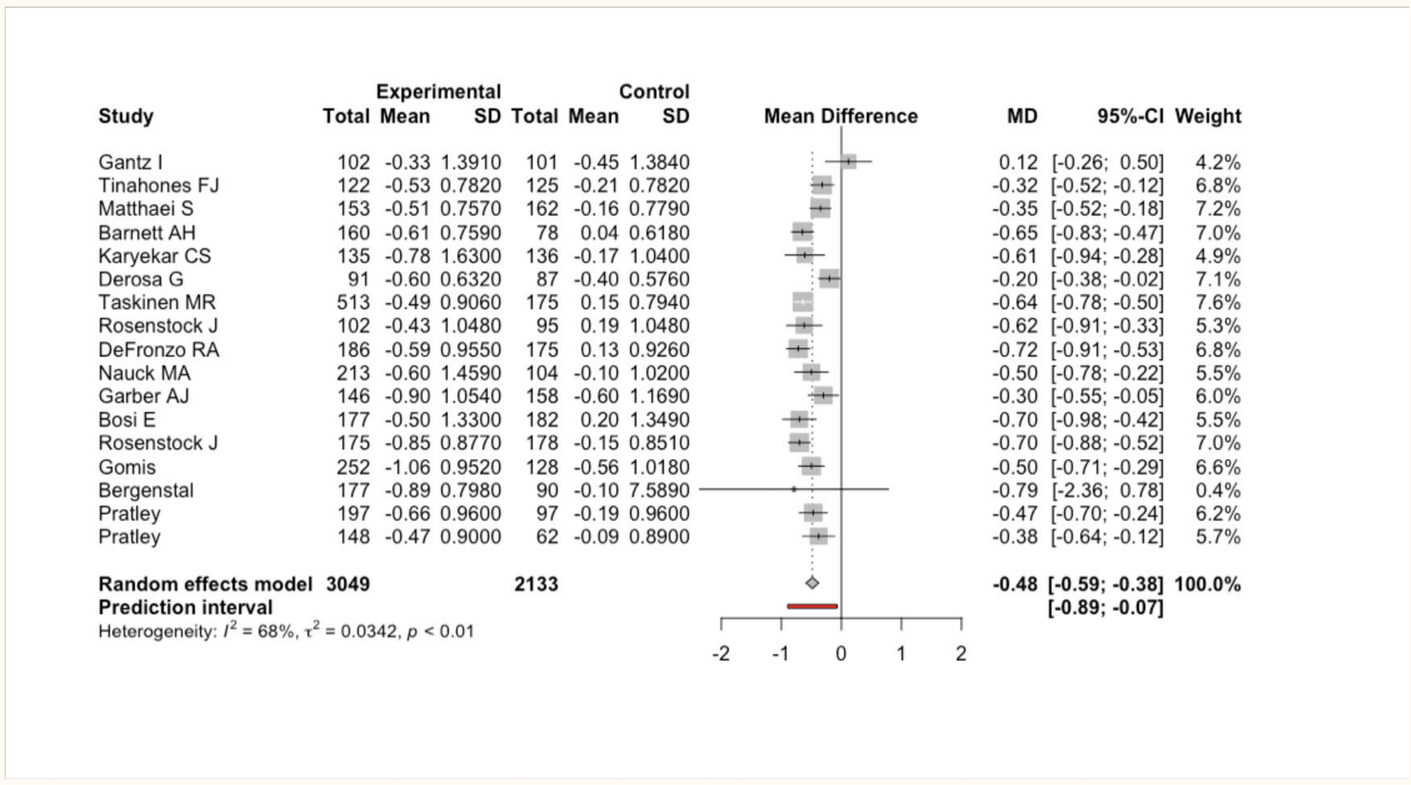

Figure 2 : Forest plot for Whites

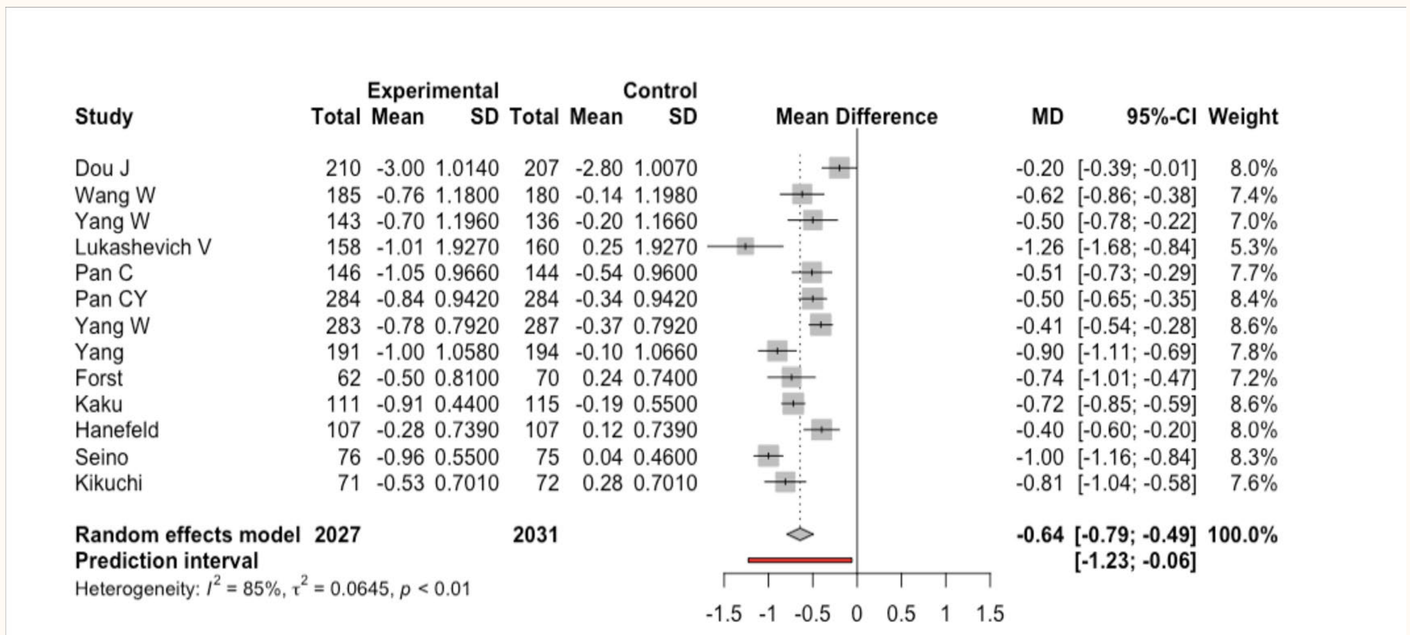

Figure 3 : Forest plot for Asians

Results

389 potentially relevant articles were identified through database searching in PubMed. Overall, 30 studies were included in the meta-analysis (Figure 1). 17 studies compared DPP-4 inhibitors to placebo therapy in the White population, and 13 other studies were in the Asian population. In the meta-analysis, the studies that included more than 70% White participants had an HbA1c change of (weighted mean difference[WMD]) -0.48% ; 95% CI -0.59, -0.38) (Figure2); whereas in those studies including more than 70% Asian participants, HbA1c changed by -0.64%; 95% CI -0.79, -0.49) (Figure 3).

Conclusion

The glucose lowering efficacy of DPP-4 inhibitors showed no significant differences between Whites and Asians.

Further investigation is required to understand the underlying mechanism particularly in relation to BMI, duration of diabetes, treatment duration and baseline HbA1c.

Acknowledgements

Pearson Group, INSPIRED students, Postdocs, Principal Investigators and Health Informatics Centre (HIC)

The research was commissioned by the National Institute for Health Research using Official Development Assistance (ODA) funding [INSPIRED 16/136/102].

Disclamer: *The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health and Social Care.*