Improvement of beta-cell function with DPP-4 inhibitor alogliptin alone and in combination with pioglitazone as a potential treatment target in metformin treated PCOS with persistent high metabolic risk: randomized pilot study

Mojca Jensterle[1], Katja Goricar[2], Andrej Janez[1]

[1]Department of Endocrinology, Diabetes and Metabolic Diseases, University Medical Centre Ljubljana
[2]Institute of Biochemistry, Faculty of Medicine, University of Ljubljana

OBJECTIVES

Hgh conversion rates to impaired glucose tolerance (IGT) and diabetes in PCOS indicate that current treatment strategy with lifestyle modification and metformin is insufficient. Preservation of *β*-cell function remains unaddressed although it is declined by 80% long before IGT is identified. The aim of the study was to evaluate whether the addition of DPP 4 inhibitor alogliptin alone or in combination with pioglitazone improves *β*-cell function along with insulin resistance (IR) in metformin treated PCOS with persistent high metabolic risk.

METHODS

In 12-week randomized study, alogliptin (ALO) 25 mg QD (n=15) or alogliptin 25 mg QD and pioglitazone (PIO) 30 mg QD (n=15) was added to metformin (MET) 1000 mg BID in PCOS women (aged 34.4 ± 6.5 years, BMI 39.0 ± 4.9 kg/m^2, HOMA-IR 4.82 ± 2.52, mean ± SD). Model derived parameters of glucose homeostasis from meal test (MTT) were determined. Ability of *β*-cell function was assessed by adaptation index (AI).

RESULTS

MET-ALO and MET-ALO-PIO resulted in significant decrease of HOMA-IR (for-1.56±2.29 (p=0.039) vs -2.86±3.34 (p=0.001)) and increase in insulin sensitivity (IS) after meal ingestion (oral glucose IS for 31.37± 97.52 ml min^{-1} m^{-2} (p=0.007) vs 39.0± 58.11 (p=0.039), respectively. AI across the entire group was significantly improved from 329.60±200.63 to 442.51±303.87 (p=0.048).

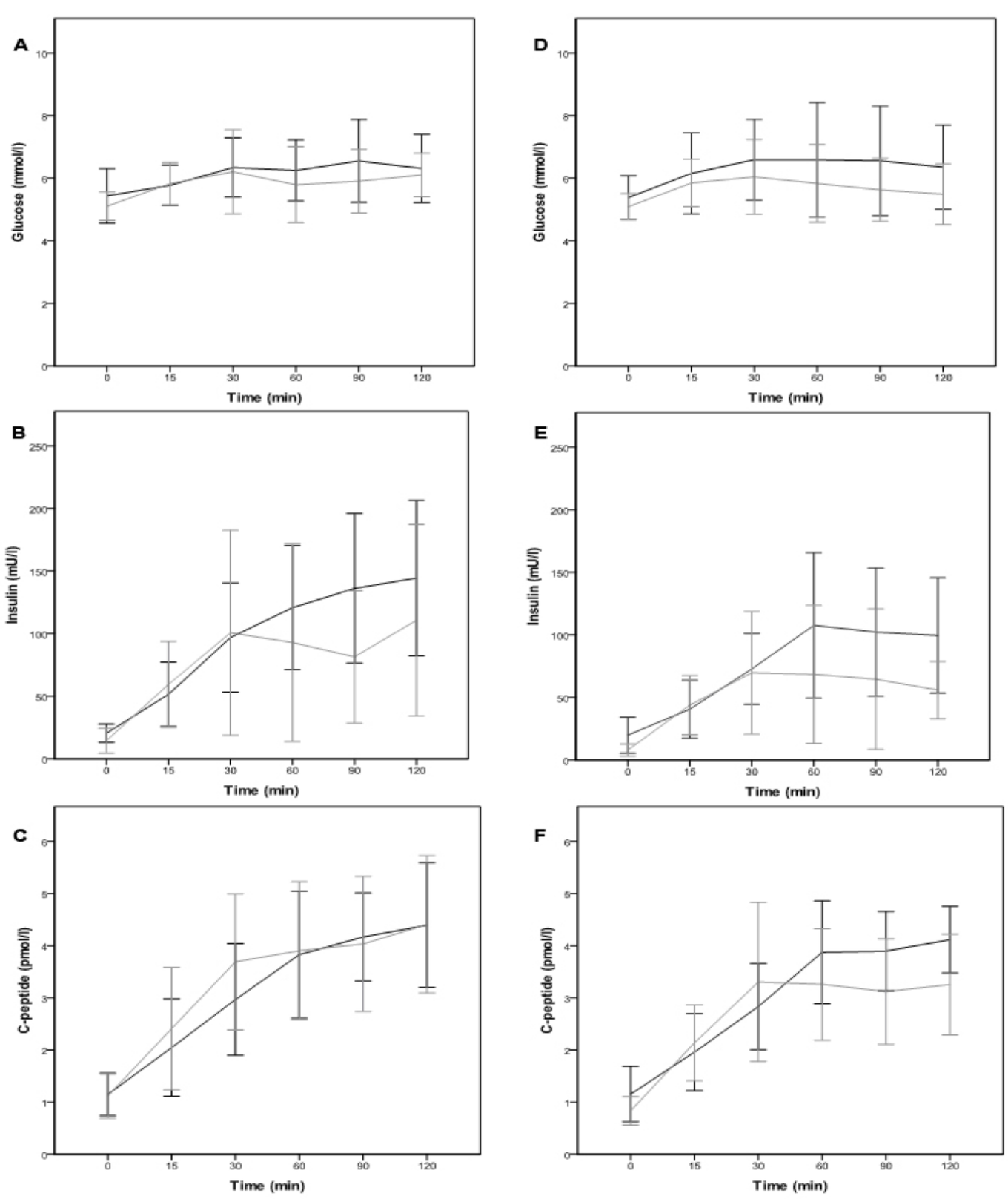

Figure: Glucose, insulin and C-peptide levels during MTT before (black) and after (grey) treatment with MET+ALO (A-C) and MET+ALO+PIO (D-F). Data are presented as mean±SD.

CONCLUSIONS

Alogliptin alone and in combination with pioglitazone improved meal related *β*-cell function along with IS and IR when added to metformin resistant PCOS.