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

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OBJECTIVES

High 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/m², 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).

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.