

## Real-world Characterization of Treatment Intensified (Add-on to Metformin) Adults with Type 2 Diabetes in Pakistan: A Multi-center Retrospective Study (Converge)

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**Abstract :** Background: Cardiovascular disease (CVD) is a major burden among people with type 2 diabetes (T2D) with 1 in 3 reported to have CVD. Therefore, understanding real-world clinical characteristics and prescribing patterns could help in better care. Objective: The CONVERGE (Cardiovascular Outcomes and Value in the Real world with GLP-1RAs) study characterized demographics and medication usage patterns in T2D intensified (add-on to metformin) overall population. The data were further divided into subgroups {dipeptidyl peptidase-4 inhibitors (DPP-4is), sulfonylureas (SUs), insulins, glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and sodium-glucose cotransporter-2 inhibitors (SGLT-2is)}, according to the latest prescribed antidiabetic agent (ADA) in India/Pakistan/Thailand. Here, we report findings from Pakistan. Methods: A multi-center retrospective study utilized data from medical records between 13-Sep-2008 (post-market approval of GLP-1RAs) and 31-Dec-2017 in adults ( $\geq 18$ -year-old). The data for this study were collected from 05 centers / institutes located in major cities of Pakistan, including Karachi, Lahore, Islamabad, and Multan. These centers included National Hospital, Aga Khan University Hospital, Diabetes Endocrine Clinic Lahore, Shifa International Hospital, Mukhtar A Sheikh Hospital Multan. Data were collected at start of medical record and at 6 or 12-months prior to baseline based on variable type; analyzed descriptively. Results: Overall, 1,010 patients were eligible. At baseline, overall mean age (SD) was 51.6 (11.3) years, T2D duration was 2.4 (2.6) years, HbA1c was 8.3% (1.9) and 35% received  $\geq 1$  CVD medications in the past 1-year (before baseline). Most frequently prescribed ADAs post-metformin were DPP-4is and SUs (~63%). Only 6.5% received GLP-1RAs and SGLT-2is were not available in Pakistan during the study period. Overall, it took a mean of 4.4 years and 5 years to initiate GLP-1RAs and SGLT-2is, respectively. In comparison to other subgroups, more patients from GLP-1RAs received  $\geq 3$  types of ADA (58%),  $\geq 1$  CVD medication (64%) and had higher body mass index (37kg/m<sup>2</sup>). Conclusions: Utilization of GLP-1RAs and SGLT-2is was low, took longer time to initiate and not before trying multiple ADAs. This may be due to lack of evidence for CV benefits for these agents during the study period. The planned phase 2 of the CONVERGE study can provide more insights into utilization and barriers to prescribe GLP-1RAs and SGLT-2is post 2018 in Pakistan.

**Keywords :** type 2 diabetes, GLP-1RA, treatment intensification, cardiovascular disease

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