SUPPLEMENTARY MATERIAL

Real-World Cohort Study of Semaglutide in Adults With Type 2 Diabetes Using an Electronic Health Records Database in Tianjin, China

Short running title: Real-world once-weekly semaglutide in Tianjin, China

Shanshan Wang, MMeD.,[1] Ping Hu, M.D.,[2] Zewei Shen, MSc.,[2] Liming Chen, Ph.D.[1]

[1]NHC Key Lab of Hormones and Development and Tianjin Key Lab of Metabolic Diseases, Tianjin Medical University Chu Hsien-I Memorial Hospital & Institute of Endocrinology, Huanrui-Bei Road 6#, Tianjin 300134, China.

[2]Novo Nordisk (Shanghai), 5F, Tower 3, Lei Shing Hong Center, No. 8, Guangshunnan Avenue, Chaoyang District, 100102 Beijing.

Correspondence: Liming Chen

Address: No.6 North Huanrui Rd, Beichen District, Tianjin 300134, P.R China

Tel: +86-13920979401

Email: xfx22081@vip.163.com

Contents

Supplementary Methods

Data-management and quality-control procedures

During the development of the Tianjin Healthcare and Medical Big Data Platform, quality-control management systems were established to ensure data quality and reliability across covered healthcare institutions. This system primarily includes a basic rules management system, which is based on four dimensions: accuracy, completeness, relevance, and redundancy. It incorporates over 20 foundational data quality-control rules, such as non-empty checks, ID accuracy checks, duplication checks, and matching verification, to ensure data quality and reliability at every stage.

In this study, we implemented thorough quality control during the data curation process for the extracted dataset, and utilized the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) methodology [1]. The OMOP CDM, a globally adopted open community data standard, is designed to standardize the structure and content of observational data and enable efficient analyses that can produce reliable evidence.

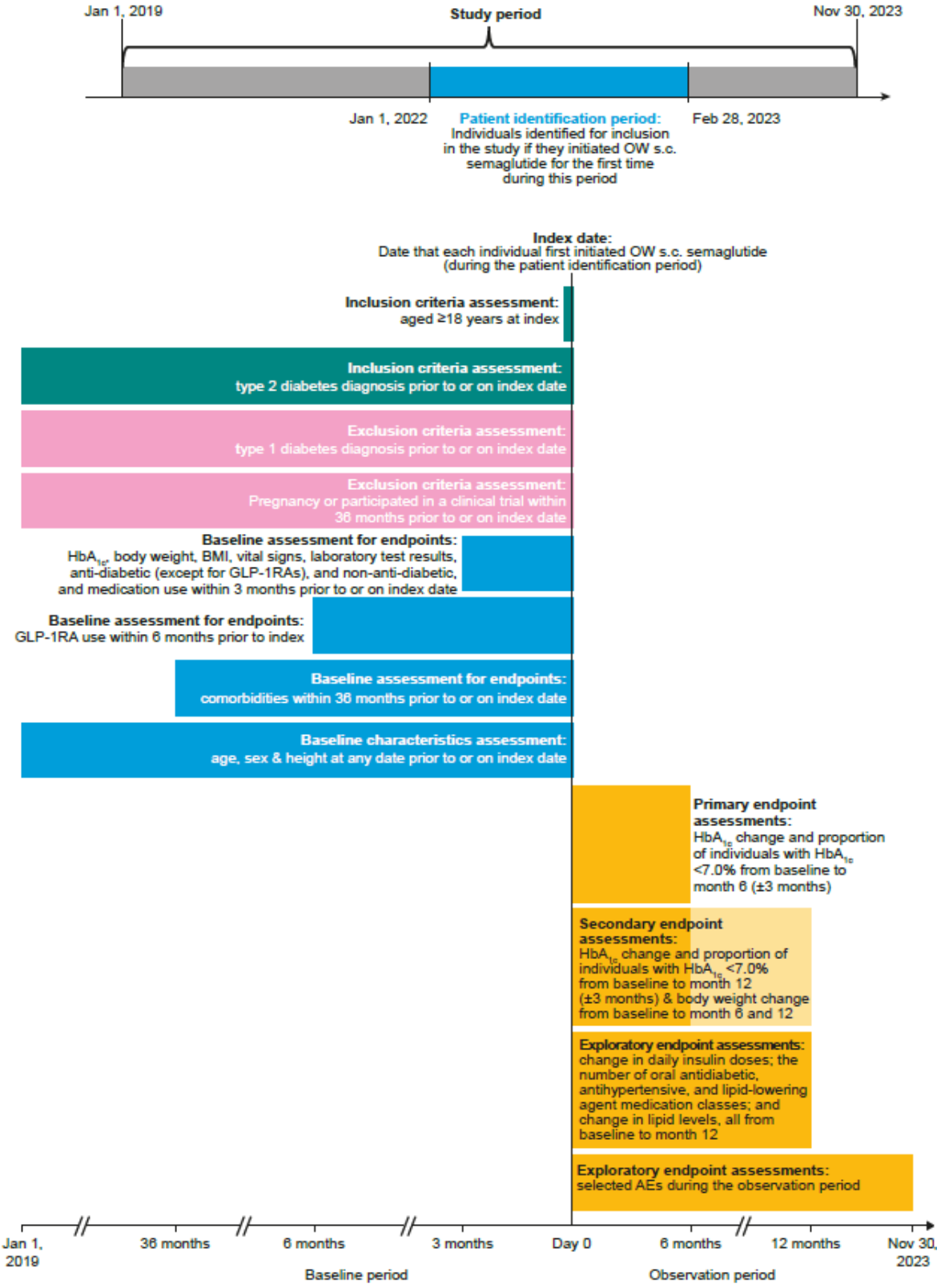
Pre-selected list of adverse events

Diarrhea, nausea, decreased appetite, retinopathy complication, vomiting, abdominal discomfort, constipation, acute pancreatitis, chronic pancreatitis, cholecystitis, cholelithiasis, medullary thyroid cancer, thyroidectomy, ileus, pancreatic carcinoma, hypoglycemia, lipase increased, and amylase increased.

Sample size calculations

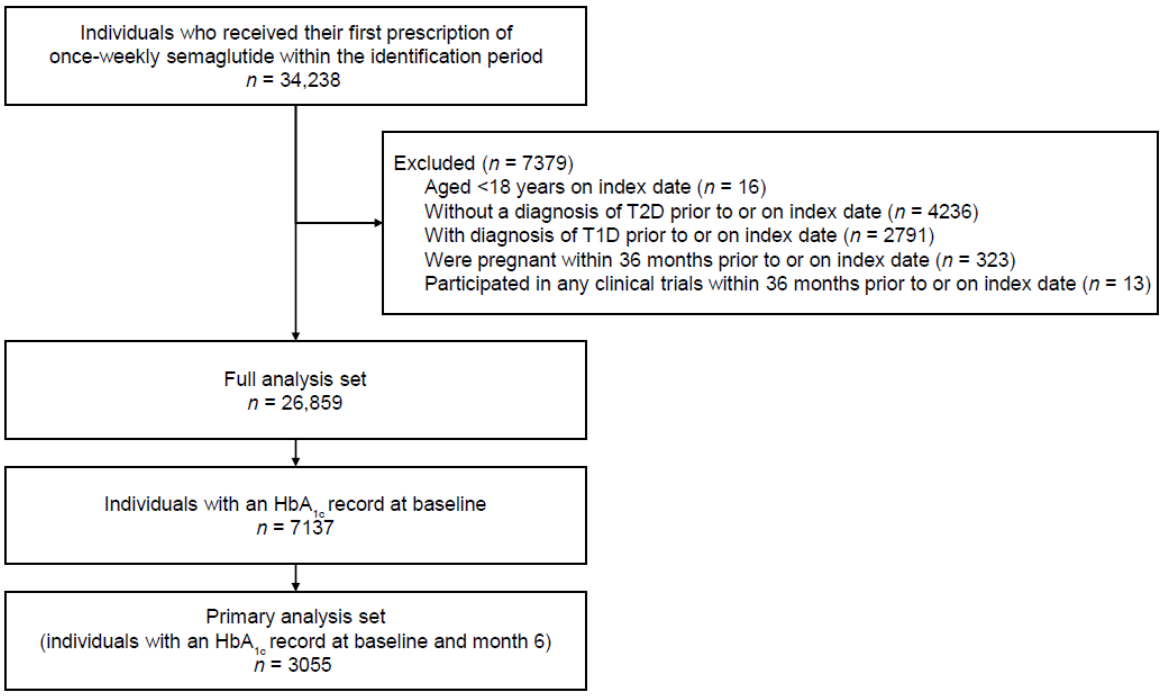
To determine whether the number of individuals was sufficient for the analysis, the minimum sample size was calculated based on the two primary endpoints. It was determined that a minimum of 317 individuals were required to achieve a two-sided significance level of 5%.

Fig. S1 Overview of the study design and assessment windows



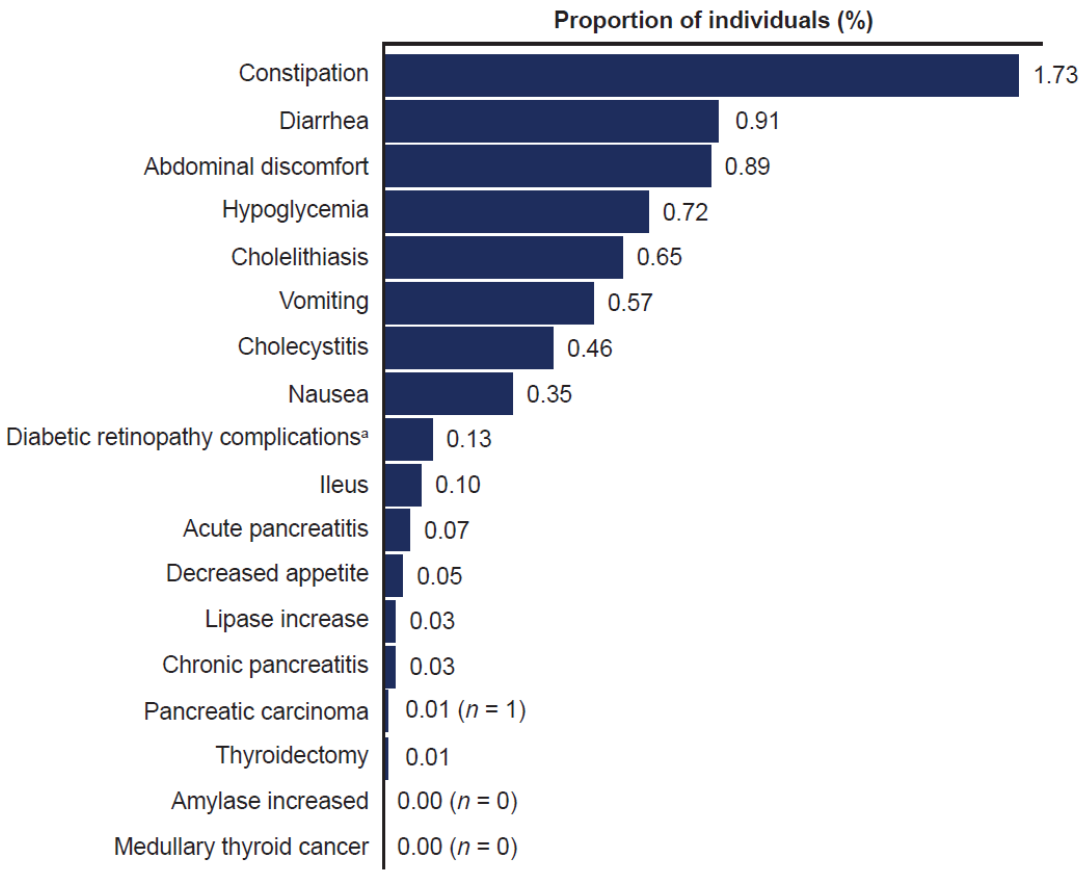
AE adverse event, *BMI* body mass index, *GLP-1RA* glucagon-like peptide-1 receptor agonist, *HbA$_{1c}$* glycated hemoglobin, *OW* once-weekly, *s.c.* subcutaneous

Fig. S2 Patient disposition



HbA_{1c} glycated hemoglobin, *T1D* type 1 diabetes, *T2D* type 2 diabetes

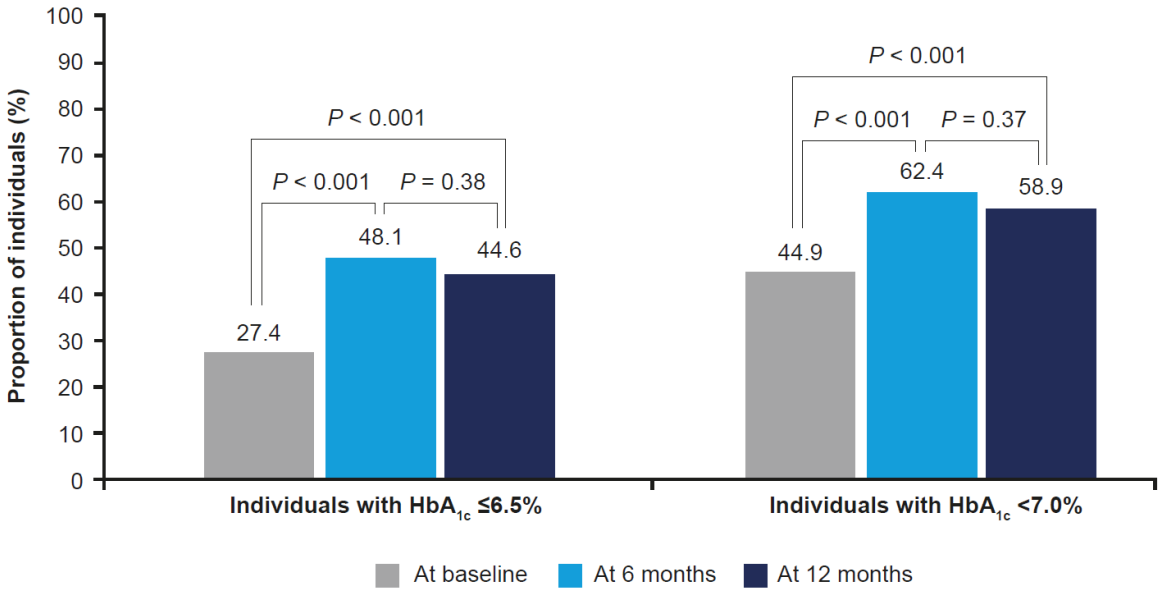
Fig. S3 Adverse events in the full analysis set (*n* = 26,859)



Adverse events from a preselected list among individuals during the on-treatment period (only adverse events identified during periods of continuous semaglutide treatment, plus 30 days at the end of all continuous treatment periods, were included)

[a]Diabetic retinopathy complications included vitreous hemorrhage, blindness, or conditions requiring treatment with an intravitreal agent or photocoagulation.

Fig. S4 Proportion of individuals with HbA_{1c} ≤6.5% or <7.0% at 6 and 12 months among individuals with continuous semaglutide treatment



Data include individuals with continued semaglutide treatment at month 12, and available HbA_{1c} measurements at 6 and 12 months (n = 314)

HbA_{1c} glycated hemoglobin

Table S1 Verification of T2D diagnosis and exploration of potential reasons for using once-weekly semaglutide with HbA_{1C} <7.0% at baseline

	Individuals in the FAS with HbA_{1c} <7.0% at baseline	*Individuals in the primary analysis set with HbA_{1c} <7.0% at baseline*
Prior anti-diabetic medication use, and medical history for individuals with HbA_{1c} <7.0% in the FAS		
HbA_{1c} <7.0% at baseline	2394	1234
Without any anti-diabetic medication use any time prior to or on index date	115 (4.8)	20 (1.6)
Without any HbA_{1c} >6.5% or fasting blood glucose >7.0 mmol/L or 2h OGTT >11.1 mmol/L recorded prior to or on index date	75 (3.1)	11 (0.9)
Without diagnosis of T2D complications (i.e., diabetic retinopathy, diabetic neuropathy, and diabetic nephropathy) prior to or on index date	68 (2.8)	9 (0.7)
Without ≥2 outpatient T2D diagnoses or one inpatient T2D diagnosis throughout the entire study period	27 (1.1)	1 (0.1)
Prior history of GLP-1RA or insulin use and comorbidities among patients with HbA_{1c} <7.0% at baseline		
Use of GLP-1RA or insulin within 6 months prior to or on index date and/or with any diagnosis of CVD, hypertension, hyperlipidemia, overweight/obesity, or chronic kidney disease any time prior to or on index date	2381 (99.5)	1232 (99.8)
Use of GLP-1RA or insulin within 6 months prior to or on index date	1553 (64.9)	853 (69.1)
Diagnosis of comorbidities including CVD, hypertension, hyperlipidemia, overweight/obesity, or chronic kidney disease any time prior to or on index date	2378 (99.3)	1229 (99.6)

Data are *n* (%). The primary analysis set included individuals with an available HbA_{1c} measurement at baseline and 6 months

CVD diagnosis included myocardial infarction, coronary heart disease, congestive heart failure, stroke, cerebrovascular disease, and peripheral vascular disease. Hypertension diagnosis was defined as SBP ≥140 and/or DBP ≥90 mmhg. Hyperlipidemia diagnosis was defined as total cholesterol ≥5.2 mmol/L, high-density lipoprotein cholesterol <1.0 mmol/L, low-density lipoprotein cholesterol ≥2.6 mmol/L, or triglycerides ≥1.7 mmol/L. Overweight/obesity was defined as body mass index ≥24 kg/m²

CVD cardiovascular disease, *DBP* diastolic blood pressure, *FAS* full analysis set, *GLP-1RA* glucagon-like peptide-1 receptor agonist, *HbA_{1c}* glycated hemoglobin, *OGTT* oral glucose tolerance test, *SBP* systolic blood pressure, *T2D* type 2 diabetes

Reference

1. OMOP Common Data Model v5.4. Observational Medical Outcomes Partnership. Accessed Nov 25, 2025. https://ohdsi.github.io/CommonDataModel/