Detailed findings from CAROLINA® outcome trial support long-term cardiovascular safety profile of Tradjenta®

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- CAROLINA® demonstrated no increased cardiovascular risk for Tradjenta® (linagliptin) versus glimepiride in the only active-comparator cardiovascular outcome trial for a dipeptidyl peptidase-4 (DPP-4) inhibitor

- Adults with diabetes treated with Tradjenta experienced fewer events of hypoglycemia and a modest weight reduction compared with glimepiride

- Detailed results from CAROLINA were presented at the American Diabetes Association's 79th Scientific Sessions

RIDGEFIELD, Conn. and INDIANAPOLIS, June 10, 2019 /PRNewswire/ -- Boehringer Ingelheim and Eli Lilly and Company (NYSE: LLY) announced detailed findings from the CAROLINA® trial demonstrating that Tradjenta® (linagliptin) did not increase cardiovascular risk compared with glimepiride in adults with type 2 diabetes and cardiovascular risk. The findings were reported today at the American Diabetes Association's 79th Scientific Sessions® in San Francisco.

The trial met its primary endpoint, defined as non-inferiority for Tradjenta versus glimepiride in time to first occurrence of cardiovascular death, non-fatal myocardial infarction or non-fatal stroke (3P-MACE), which occurred in 11.8% (356 people) of the Tradjenta group compared with 12.0% (362 people) of the glimepiride group. The overall safety profile of Tradjenta in CAROLINA was consistent with previous data, and no new safety signals were observed.

The study assessed Tradjenta safety over the longest period ever studied in a DPP-4 inhibitor cardiovascular outcome trial, with a median follow-up of more than 6 years. Tradjenta was similar to glimepiride in the secondary endpoint of 3P-MACE plus hospitalization for unstable angina (4P-MACE) (13.2% for Tradjenta versus 13.3% for glimepiride).

"Millions of people living with type 2 diabetes are at an increased risk for cardiovascular disease," said Mohamed Eid, M.D., M.P.H., M.H.A., vice president, Clinical Development & Medical Affairs, Boehringer Ingelheim Pharmaceuticals, Inc. "When treatment with a DPP-4 inhibitor such as Tradjenta is appropriate, it is critical that physicians have therapeutic options with established long-term safety and tolerability. The findings from CAROLINA complement the results from CARMELINA®, which demonstrated similar long-term cardiovascular safety for Tradjenta compared with placebo, including no increased risk of hospitalization for heart failure, in adults with type 2 diabetes at high risk for cardiovascular and kidney disease."

In CAROLINA, a higher proportion of the Tradjenta group (16.0%) achieved the secondary composite efficacy endpoint of treatment sustainability compared with the glimepiride group (10.2%).* Compared with glimepiride, Tradjenta demonstrated similar overall effects on A1C, but reduced the relative risk for hypoglycemia (low blood sugar) by 77% (10.6% of patients treated with Tradjenta experienced any hypoglycemic incident versus 37.7% for glimepiride). This risk reduction was consistent across all hypoglycemia categories, including severe hypoglycemia requiring hospitalization. Tradjenta was also associated with a modest weight reduction of 1.5 kg versus glimepiride.

"The American College of Cardiology and American Diabetes Association recommend type 2 diabetes treatments with proven cardiovascular benefits for patients with established cardiovascular disease," said Jeff Emmick, M.D., Ph.D., vice president, Product Development, Lilly Diabetes. "But physicians considering additional therapies to lower blood glucose for their patients need a DPP-4 inhibitor with an established long-term safety profile. This new data from CAROLINA, along with data from the placebo-controlled cardiovascular outcome trial CARMELINA, expands the evidence and experience with Tradjenta, to provide healthcare professionals with confidence in the long-term safety profile across a broad range of patients with type 2 diabetes."

ABOUT CAROLINA (NCT01243424)

CAROLINA (CARdiovascular Outcome study of LINAgliptin versus glimepiride in patients with type 2 diabetes) is a multi-national, randomized, double-blind, active-controlled clinical trial that involved 6,033 adults with type 2 diabetes from 43 countries at more than 600 sites observed for a median duration of more than 6 years. The trial included adults with early type 2 diabetes: adults with a median disease duration of 6.2 years who either received no treatment or received one or two glucose-lowering agents (e.g., metformin). The study was designed to assess the effect of Tradjenta (5 mg once daily) compared with the sulfonylurea glimepiride (both added to stable background glucose-lowering medication and cardiovascular standard of care) on cardiovascular safety in adults with type 2 diabetes and increased cardiovascular risk or established cardiovascular disease. These patients reflect people that doctors typically see in their daily clinical practice.

CAROLINA was led by an academic trial steering committee and Boehringer Ingelheim and Eli Lilly and Company. CAROLINA is the only DPP-4 inhibitor active-comparator cardiovascular outcome trial.

About our cardiovascular outcome trials

Cardiovascular outcome trials are highly relevant, as cardiovascular disease is a major complication and the leading cause of death in people with type 2 diabetes. Worldwide, most people with type 2 diabetes die of a cardiovascular event. In 2015, Boehringer Ingelheim and Eli Lilly and Company announced results from the landmark cardiovascular outcome trial EMPA-REG OUTCOME® with the SGLT2 inhibitor empagliflozin, which reduced the

relative risk of cardiovascular death by 38% in adults with type 2 diabetes and established cardiovascular disease, on top of standard of care.[†‡] As a result, empagliflozin was the first type 2 diabetes medicine approved by the FDA to reduce the risk of cardiovascular death.

CAROLINA is one of two cardiovascular outcome trials with the DPP-4 inhibitor Tradjenta. CAROLINA and CARMELINA (CArdiovascular safety and Renal Microvascular outcomE with LINAgliptin in patients with type 2 diabetes at high vascular risk) provide one of the most comprehensive datasets on the long-term safety of a DPP-4-inhibitor across a broad range of patients with type 2 diabetes.

CARMELINA is a multi-national, randomized, double-blind, placebo-controlled clinical trial that involved 6,979 adults with type 2 diabetes from 27 countries at more than 600 sites observed for a median duration of 2.2 years. CARMELINA studied the impact of Tradjenta on cardiovascular and kidney safety in adults with type 2 diabetes at high risk for cardiovascular and/or kidney disease. The study met its primary endpoint,[§] with Tradjenta demonstrating a similar cardiovascular safety profile compared with placebo when added to standard of care. CARMELINA also included a key secondary composite endpoint,[**] showing a similar kidney safety profile compared with placebo. The overall safety profile of Tradjenta in CARMELINA was consistent with previous data, and no new safety signals were observed. CARMELINA also showed a similar rate of hospitalization for heart failure for Tradjenta compared with placebo.

To learn more about CARMELINA, please visit: https://www.carmelinatrial.com/

What is TRADJENTA?
TRADJENTA is a prescription medicine that is used along with diet and exercise to lower blood sugar in adults with type 2 diabetes.

TRADJENTA is not for people with type 1 diabetes or for people with diabetic ketoacidosis (increased ketones in the blood or urine).

If you have had inflammation of the pancreas (pancreatitis) in the past, it is not known if you have a higher chance of getting pancreatitis while you take TRADJENTA.

IMPORTANT SAFETY INFORMATION

What is the most important information I should know about TRADJENTA?
Serious side effects can happen to people taking TRADJENTA, including inflammation of the pancreas (pancreatitis), which may be severe and lead to death. Before you start taking TRADJENTA, tell your doctor if you have ever had pancreatitis, gallstones, a history of alcoholism, or high triglyceride levels.

Stop taking TRADJENTA and call your doctor right away if you have pain in your stomach area (abdomen) that is severe and will not go away. The pain may be felt going from your abdomen through to your back. The pain may happen with or without vomiting. These may be symptoms of pancreatitis.

Heart failure. Heart failure means your heart does not pump blood well enough. Before you start taking TRADJENTA, tell your doctor if you have ever had heart failure or have problems with your kidneys. Contact your doctor right away if you have any of the following symptoms: increasing shortness of breath or trouble breathing, especially when you lie down; swelling or fluid retention, especially in the feet, ankles, or legs; an unusually fast increase in weight or unusual tiredness. These may be symptoms of heart failure.

Who should not take TRADJENTA?
Do not take TRADJENTA if you are allergic to linagliptin or any of the ingredients in TRADJENTA.

Symptoms of a serious allergic reaction to TRADJENTA may include rash, itching, flaking or peeling; raised red patches on your skin (hives); swelling of your face, lips, tongue, and throat that may cause difficulty breathing or swallowing. If you have any of these symptoms, stop taking TRADJENTA and call your doctor or go to the emergency room right away.

What should I tell my doctor before using TRADJENTA?
Tell your doctor about all your medical conditions, including if you have or have had inflammation of your pancreas (pancreatitis). Tell your doctor about all the medicines you take, including prescription and non-prescription medicines, vitamins, and herbal supplements. TRADJENTA may affect the way other medicines work, and other medicines may affect how TRADJENTA works. Especially tell your doctor if you take

- other medicines that can lower your blood sugar. If you take TRADJENTA with another medicine that can cause low blood sugar, such as sulfonylurea or insulin, your risk of getting low blood sugar is higher. The dose of your sulfonylurea or insulin may need to be lowered while you take TRADJENTA.
- rifampin (Rifadin®, Rimactane®, Rifater®, Rifamate®),* an antibiotic that is used to treat tuberculosis.

*These trademarks are owned by third parties not affiliated with TRADJENTA.

Tell your doctor if you are pregnant or planning to become pregnant or are breastfeeding or plan to breastfeed.

What are the possible side effects of TRADJENTA?
TRADJENTA may cause serious side effects, including

- Inflammation of the pancreas (pancreatitis).
- Low blood sugar (hypoglycemia), especially if you take TRADJENTA with another medicine that can cause low blood sugar. Signs and symptoms of low blood sugar may include headache, drowsiness, weakness, dizziness, confusion, irritability, hunger, fast heartbeat, sweating, or feeling jittery.

- Allergic (hypersensitivity) reactions can happen after your first dose or up to 3 months after starting TRADJENTA. Symptoms may include swelling of your face, lips, throat, and other areas on your skin; difficulty with swallowing or breathing; raised, red areas on your skin (hives); skin rash, itching, flaking, or peeling.

- Joint pain. Some people who take medicines called dipeptidyl peptidase-4 (DPP-4) inhibitors like TRADJENTA, may develop joint pain that can be severe. Call your doctor if you have severe joint pain.

- Skin Reaction. Some people who take medicines called DPP-4 inhibitors like TRADJENTA, may develop a skin reaction called bullous pemphigoid which can be serious and may need to be treated in a hospital. Tell your doctor right away if you develop blisters.

The most common side effects of TRADJENTA include stuffy or runny nose, sore throat, cough, and diarrhea.

These are not all the possible side effects of TRADJENTA. For more information, ask your doctor or pharmacist. **You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.**

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Boehringer Ingelheim and Eli Lilly and Company
In January 2011, Boehringer Ingelheim and Eli Lilly and Company announced an alliance in diabetes that centers on compounds representing several of the largest diabetes treatment classes. The alliance leverages the strengths of two of the world's leading pharmaceutical companies. By joining forces, the companies demonstrate commitment in the care of people with diabetes and stand together to focus on patient needs. Find out more about the alliance at www.boehringer-ingelheim.com or www.lilly.com.

About Boehringer Ingelheim
Boehringer Ingelheim Pharmaceuticals, Inc., based in Ridgefield, Conn., is the largest U.S. subsidiary of Boehringer Ingelheim Corporation.

Boehringer Ingelheim is one of the world's top 20 pharmaceutical companies. Headquartered in Ingelheim, Germany, the company operates globally with approximately 50,000 employees. Since its founding in 1885, the company has remained family-owned, and today our goal is to improve the lives of humans and animals through its three business areas: human pharmaceuticals, animal health and biopharmaceutical contract manufacturing.

Boehringer Ingelheim concentrates on developing innovative therapies that can improve and extend patients' lives. As a research-driven pharmaceutical company, it plans in generations for long-term success. Its research efforts are focused on diseases with high, unmet medical need. In animal health, the company stands for advanced prevention.

In 2018, Boehringer Ingelheim achieved net sales of around $20.7 billion (17.5 billion euros). R&D expenditure of almost $3.7 billion (3.2 billion euros) corresponded to 18.1 per cent of net sales.

Boehringer Ingelheim is committed to improving lives and strengthening our communities. Please visit www.boehringer-ingelheim.us/csr to learn more about Corporate Social Responsibility initiatives.

For more information, please visit www.boehringer-ingelheim.us, or follow us on Twitter @BoehringerUS.

About Lilly Diabetes
Lilly has been a global leader in diabetes care since 1923, when we introduced the world's first commercial insulin. Today we are building upon this heritage by working to meet the diverse needs of people with diabetes and those who care for them. Through research and collaboration, a wide range of therapies and a continued determination to provide real solutions—from medicines to support programs and more—we strive to make life better for all those affected by diabetes around the world. For more information, visit www.lillydiabetes.com.

About Eli Lilly and Company
Lilly is a global healthcare leader that unites caring with discovery to make life better for people around the world. We were founded more than a century ago by a man committed to creating high-quality medicines that meet real needs, and today we remain true to that mission in all our work. Across the globe, Lilly employees work to discover and bring life-changing medicines to those who need them, improve the understanding and management of disease, and give back to communities through philanthropy and volunteerism. To learn more about Lilly, please visit us at www.lilly.com and newsroom.lilly.com/social-channels.

This press release contains forward-looking statements (as that term is defined in the Private Securities Litigation Reform Act of 1995) about Tradjenta and its safety profile, and reflects Lilly's current belief. However, as with any pharmaceutical product, there are substantial risks and uncertainties in the process of development and commercialization. Among other things, there can be no guarantee that future study results will be consistent with the results to date or that Tradjenta will receive additional regulatory approvals. For further discussion of these and other risks and uncertainties, see Lilly's most recent Form 10-K and Form 10-Q filings with the United States Securities and Exchange Commission. Except as required by law, Lilly undertakes no duty to update forward-looking statements to reflect events after the date of this release.

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* Secondary composite efficacy outcome defined as A1C at or below 7% at the final visit without rescue medication, moderate or severe hypoglycemia or a 2% or greater weight gain

† Adults with type 2 diabetes and coronary artery disease, peripheral artery disease, or a history of MI or stroke

‡ Standard of care included cardiovascular medications and blood sugar lowering agents given at the discretion of physicians

§ Primary endpoint defined as time to first occurrence of the 3P-MACE (cardiovascular death, non-fatal myocardial infarction or non-fatal stroke)

** Key secondary endpoint defined as time to first occurrence of sustained end stage kidney disease (ESKD), death due to kidney disease, or a sustained decrease in eGFR from baseline of ≥40% compared to placebo

View original content to download multimedia:http://www.prnewswire.com/news-releases/detailed-findings-from-carolina-outcome-trial-support-long-term-cardiovascular-safety-profile-of-tradjenta-300864614.html

SOURCE Eli Lilly and Company