Results from Investigational IMPROVE-IT Study of VYTORIN® (ezetimibe and simvastatin) Published in the New England Journal of Medicine

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KENILWORTH, N.J.--(BUSINESS WIRE)--Merck (NYSE: MRK), known as MSD outside the United States and Canada, today announced that the New England Journal of Medicine published the results of the IMPROVE-IT trial, an investigational study comparing treatment with VYTORIN® (ezetimibe and simvastatin) to treatment with simvastatin alone in more than 18,000 patients presenting with acute coronary syndromes.

The results of IMPROVE-IT were first presented at the American Heart Association Scientific Sessions in November, 2014. In IMPROVE-IT, patients taking the LDL-cholesterol-lowering medicine VYTORIN— which combines simvastatin with the non-statin ZETIA ® (ezetimibe)—experienced significantly fewer major cardiovascular events (as measured by a composite of cardiovascular death, non-fatal myocardial infarction, non-fatal stroke, re-hospitalization for unstable angina or coronary revascularization occurring at least 30 days after randomization) than patients treated with simvastatin alone.

“IMPROVE-IT was designed to answer a very important scientific question about the relationship between cardiovascular risk and lowering LDL-C to very low levels with ezetimibe in combination with a statin, and we are pleased that the results are now being published in NEJM,” said Eugene Braunwald, M.D., study co-chair, founding chair of the TIMI Study Group at Brigham and Women's Hospital. “We are very grateful to our investigators and to the participating patients for their commitment to completion of this complex, nine-year study. The analyses of the 18,000 patient IMPROVE-IT study are a robust addition to the many other important studies on the importance of lowering LDL-C.”

VYTORIN and ZETIA are currently indicated for use along with a healthy diet to reduce elevated LDL cholesterol in patients with hyperlipidemia. The current U.S. Prescribing Information for both products states that the effect of ezetimibe on cardiovascular morbidity and mortality, alone or incremental to statin therapy, has not been determined. Merck has submitted the data from the IMPROVE-IT study to the U.S. Food and Drug Administration to support a new indication for reduction of cardiovascular events for ZETIA (ezetimibe) and VYTORIN (ezetimibe and simvastatin).

In November 2014, Merck announced IMPROVE-IT met its primary and all secondary composite efficacy endpoints. In IMPROVE-IT, at seven years, 32.7 percent of patients taking VYTORIN experienced a first primary endpoint event (major cardiovascular event) compared to 34.7 percent of patients taking simvastatin alone, corresponding to a 6.4% relative risk reduction (absolute risk reduction 2%, hazard ratio of 0.936, 95% CI 0.887 to 0.988, p=0.016). The mean LDL-C in the study at one year was 53 mg/dl in the VYTORIN arm and 70 mg/dl in the simvastatin arm.

In a separate exploratory analysis of major vascular events, the risk reduction in the VYTORIN arm compared to the simvastatin alone arm was consistent with the treatment effect that had been projected based on prior studies of statins.

There were no significant differences between treatment groups in adverse events of special interest, which included myopathy and rhabdomyolysis, gallbladder adverse events, liver enzyme elevations greater than or equal to three times the upper limit of normal (ULN) and cancer. These safety findings from IMPROVE-IT were generally consistent with current labeling for ezetimibe. Among 9,067 patients in the ezetimibe/simvastatin group vs. 9,077 patients in the simvastatin group, myopathy was reported in 0.2 percent vs. 0.1 percent of patients, respectively; rhabdomyolysis was reported in 0.1 percent vs. 0.2 percent; gallbladder-related adverse events were reported in 3.1 percent vs. 3.5 percent; cholecystectomy was reported in 1.5 percent vs. 1.5 percent; and alanine aminotransferase (ALT) and/or aspartate transaminase (AST) elevations (greater than or equal to three times ULN, consecutive) were reported in 2.5 percent vs. 2.3 percent patients. Over seven years, new, relapsing or progressing cancer was reported in 10.2 percent of patients in both treatment groups.

VYTORIN should not be taken with strong CYP3A4 inhibitors (e.g., itraconazole, ketoconazole, posaconazole, voriconazole, HIV protease inhibitors, boceprevir, telaprevir, erythromycin, clarithromycin, telithromycin, nefazodone, and cobicistat-containing products); or with gemfibrozil, cyclopentolate, or danazol. VYTORIN also should not be taken by people with hypersensitivity to ezetimibe and simvastatin.

About the IMPROVE-IT Trial
About ZETIA (ezetimibe)

Not be titrated to the restricted 10/80-mg dose. 10/10, 10/20, 10/40, or VYTORIN tablets contain ezetimibe and simvastatin: 10 mg of ezetimibe and 10 mg of simvastatin (VYTORIN) compared with patients treated with ezetimibe/simvastatin: 10 mg of ezetimibe and 80 mg of simvastatin (VYTORIN).

In clinical trials, the most commonly reported side effects, regardless of cause, included headache (5.8 percent), myalgia (3.6 percent), upper respiratory tract infection (3.6 percent), and diarrhea (2.8 percent).

VYTORIN tablets contain ezetimibe and simvastatin: 10 mg of ezetimibe and 10, 20, 40, or 80 mg of simvastatin (VYTORIN 10/10, 10/20, 10/40, or 10/80 mg, respectively). The usual dosage range is 10/10 mg/day to 10/40 mg/day; patients should not be titrated to the restricted 10/80-mg dose.

About VYTORIN® (ezetimibe and simvastatin)

VYTORIN contains ezetimibe and simvastatin. VYTORIN is indicated as adjunctive therapy to diet for the reduction of elevated total cholesterol, LDL cholesterol, apolipoprotein B, triglycerides, and non-HDL cholesterol, and to increase HDL cholesterol in patients with primary (heterozygous familial and nonfamilial) hyperlipidemia or mixed hyperlipidemia when diet alone is not enough.

The Prescribing Information for VYTORIN states that no incremental benefit of VYTORIN on cardiovascular morbidity and mortality over and above that demonstrated for simvastatin has been established. VYTORIN is not indicated to reduce cardiovascular events in patients who have presented with acute coronary syndromes.

Selected cautionary information about VYTORIN (ezetimibe and simvastatin)

All patients starting therapy with VYTORIN, or whose dose of VYTORIN is being increased, should be advised of the risk of myopathy, including rhabdomyolysis, and told to promptly report any unexplained muscle pain, tenderness, or weakness particularly if accompanied by malaise or fever or if muscle signs and symptoms persist after discontinuing VYTORIN. VYTORIN should be discontinued immediately if markedly elevated creatine kinase (CK) levels occur or myopathy is diagnosed or suspected. VYTORIN contains simvastatin, which occasionally causes myopathy manifested as muscle pain, tenderness, or weakness with CK levels above 10 times ULN. Myopathy sometimes takes the form of rhabdomyolysis with or without acute renal failure secondary to myoglobinuria, and rare fatalities have occurred. Predisposing factors for myopathy include advanced age (≥65 years), female gender, uncontrolled hypothyroidism, and renal impairment. The risk of myopathy, including rhabdomyolysis, is dose related.

The 10/80 mg dose of VYTORIN should not be started in new patients. The risk of myopathy, including rhabdomyolysis, is greater in patients taking simvastatin 80 mg compared with other statin therapies with similar or greater LDL cholesterol lowering efficacy, and with lower doses of simvastatin. The 10/80 mg dose of VYTORIN should be used only in patients who have been taking that dose chronically (e.g., for 12 months or more) without evidence of muscle toxicity. If a patient who is currently tolerating the 10/80 mg dose needs to be initiated on an interacting drug that is contraindicated or is associated with a dose cap for simvastatin, that patient should be switched to an alternative statin or statin-based regimen with less potential for the drug-drug interaction. Please read Warnings and Precautions in the Prescribing Information for additional information.

In addition to drugs that are contraindicated because of an increased risk of myopathy/rhabdomyolysis, grapefruit juice should be avoided. Use caution when prescribing VYTORIN with a fenofibrate, and immediately discontinue both drugs if myopathy is diagnosed or suspected. Cases of myopathy, including rhabdomyolysis, have been reported with simvastatin coadministered with colchicine, and caution should be used when prescribing VYTORIN with colchicine.

The dose of VYTORIN should not exceed 10/10 mg daily in patients receiving verapamil, diltiazem or dronedaran, and 10/20 mg daily in patients receiving amiodarone, amiodipine or ranolazine. For patients with homozygous familial hypercholesterolemia (HoFH) taking lomitapide, the dose should not exceed 10/20 mg/day (or 10/40 mg/day for patients who have previously taken simvastatin 80 mg/day chronically, e.g., for 12 months or more, without evidence of muscle toxicity); patients initiating lomitapide should have their dose of VYTORIN (ezetimibe and simvastatin) reduced by 50%. The benefits of combined use of VYTORIN with these drugs, other fenofibrates, or niacin (≥1 g/day) should be carefully weighed against the potential risk of myopathy/rhabdomyolysis. Caution should be used when Chinese patients taking niacin (≥1 g/day) are coadministered doses of VYTORIN exceeding 10/20 mg/day; Chinese patients should not receive VYTORIN 10/80 mg with niacin.

Persistent elevations in hepatic transaminase can occur. Liver function tests should be performed at treatment initiation and thereafter when clinically indicated. If serious liver injury with clinical symptoms and/or hyperbilirubinemia or jaundice occurs during treatment, therapy should be interrupted promptly and not restarted unless an alternate etiology is found.

Increases in HbA1c and fasting serum glucose levels have been reported with statins, including simvastatin.

In clinical trials, the most commonly reported side effects, regardless of cause, included headache (5.8 percent), increased ALT (3.7 percent), myalgia (3.6 percent), upper respiratory tract infection (3.6 percent), and diarrhea (2.8 percent).

IMPROVE-IT (IMProved Reduction of Outcomes: VYTORIN Efficacy International Trial) was led by the Thrombolysis In Myocardial Infarction (TIMI) Study Group of Brigham and Women’s Hospital and the Duke Clinical Research Institute (DCRI), and was sponsored by Merck. IMPROVE-IT was an international, multi-center, randomized, double-blind active comparator trial of 18,144 high-risk patients presenting with acute coronary syndromes (ACS), including unstable angina (UA), non-ST-segment elevation acute myocardial infarction (NSTemi), and ST-segment elevation acute myocardial infarction (STEMI). The study assessed the incidence of major CV events, as measured by a composite of CV death, non-fatal MI, non-fatal stroke, rehospitalization for ACS, or coronary revascularization (occurring 30 days or more after the initial event), in patients treated with ezetimibe/simvastatin (VYTORIN) compared with patients treated with simvastatin alone.

All patients in the trial were started at doses of ezetimibe and simvastatin 10/40 mg or simvastatin 40 mg. Prior to a 2011 protocol amendment, the dose could be titrated to ezetimibe/simvastatin 10/80 mg or simvastatin 80 mg if successive LDL-C values exceeded 79 mg/dL. The study enrolled patients within 10 days of ACS hospitalization who had sufficient risk as defined in the protocol and who had an initial LDL-C of ≤125 mg/dL if lipid-lowering drug naïve or <100 mg/dL if on a prior prescription lipid-lowering therapy identified as no more potent than simvastatin 40 mg/day. The LDL-C entry limitations were designed to enroll patients reasonably anticipated to achieve LDL-C levels of 70 mg/dL or less in the simvastatin only cohort, which was the optional recommended target set in the 2004 update to the Adult Treatment Panel (ATP) III guidelines.
ZETIA, administered alone or in combination with a statin, is indicated as adjunctive therapy to diet for the reduction of elevated total cholesterol, LDL cholesterol, apolipoprotein B, and non-HDL cholesterol in patients with primary (heterozygous familial and non-familial) hyperlipidemia when diet alone is not enough.

The Prescribing Information for ZETIA states that the effect of ZETIA on cardiovascular morbidity and mortality has not been determined. ZETIA is not indicated for use with a statin to further reduce cardiovascular events in patients who have presented with acute coronary syndromes.

Selected cautionary information about ZETIA

When using ZETIA with a statin, also follow the label recommendations for that specific statin.

When ZETIA was coadministered with a statin, consecutive elevations in hepatic transaminase levels (greater than or equal to 3 times ULN) were slightly higher (1.3 percent) than those of statins alone (0.4 percent). Liver function tests should be performed when ZETIA (ezetimibe) is added to statin therapy and according to statin recommendations. Should an increase in ALT or AST greater than or equal to 3 times ULN persist, consider withdrawal of ZETIA and/or the statin.

Patients should be advised to promptly report muscle pain, tenderness, or weakness. Risk for skeletal muscle toxicity increases with higher statin doses, advanced age (>65), hypothyroidism, renal impairment, and depending on the statin used, concomitant use of other drugs. Discontinue drug if myopathy is diagnosed or suspected.

ZETIA is not recommended in patients with moderate to severe hepatic impairment.

The coadministration of ZETIA with fibrate other than fenofibrate is not recommended until use in patients is adequately studied. Exercise caution when using ZETIA and cyclosporine concomitantly because exposure to both drugs is increased. Cyclosporine concentrations should be monitored in these patients.

ZETIA should be used in pregnant or nursing women only if the benefit outweighs the risk.

In clinical trials, regardless of causality assessment, the most frequent side effects for ZETIA coadministered with a statin versus a statin alone included nasopharyngitis (3.7 percent vs 3.3 percent), myalgia (3.2 percent vs 2.7 percent), upper respiratory tract infection (2.9 percent vs 2.8 percent), arthralgia (2.6 percent vs 2.4 percent), and diarrhea (2.5 percent vs 2.2 percent); for ZETIA administered alone vs placebo: upper respiratory tract infection (4.3 percent vs 2.5 percent), diarrhea (4.1 percent vs 3.7 percent), arthralgia (3.0 percent vs 2.2 percent), sinusitis (2.8 percent vs 2.2 percent), pain in extremity (2.7 percent vs 2.5 percent), and fatigue (2.4 percent vs 1.5 percent).

About Merck

Today's Merck is a global healthcare leader working to help the world be well. Merck is known as MSD outside the United States and Canada. Through our prescription medicines, vaccines, biologic therapies and animal health products, we work with customers and operate in more than 140 countries to deliver innovative health solutions. We also demonstrate our commitment to increasing access to healthcare through far-reaching policies, programs and partnerships. For more information, visit www.merck.com and connect with us on Twitter, Facebook and YouTube.

Forward-Looking Statement

This news release includes “forward-looking statements” within the meaning of the safe harbor provisions of the United States Private Securities Litigation Reform Act of 1995. These statements are based upon the current beliefs and expectations of Merck’s management and are subject to significant risks and uncertainties. If underlying assumptions prove inaccurate or risks or uncertainties materialize, actual results may differ materially from those set forth in the forward-looking statements.

Risks and uncertainties include but are not limited to, general industry conditions and competition; general economic factors, including interest rate and currency exchange rate fluctuations; the impact of pharmaceutical industry regulation and health care legislation in the United States and internationally; global trends toward health care cost containment; technological advances, new products and patents attained by competitors; challenges inherent in new product development, including obtaining regulatory approval; Merck's ability to accurately predict future market conditions; manufacturing difficulties or delays; financial instability of international economies and sovereign risk; dependence on the effectiveness of Merck’s patents and other protections for innovative products; and the exposure to litigation, including patent litigation, and/or regulatory actions.

Merck undertakes no obligation to publicly update any forward-looking statement, whether as a result of new information, future events or otherwise. Additional factors that could cause results to differ materially from those described in the forward-looking statements can be found in Merck's 2014 Annual Report on Form 10-K and the company's other filings with the Securities and Exchange Commission (SEC) available at the SEC's Internet site (www.sec.gov).


Language: English

Contact:
Merck
Media:
Pamela Eisele, (267) 305-3558
Tracy Ogden, (267) 305-2301
or
Investor:
Justin Holko, (908) 740-1879

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