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MEDIA UPDATE

Novartis sickle cell medicine Adakveo® approved in Europe to prevent recurrent vaso-occlusive crises

- *Adakveo is the first targeted sickle cell disease therapy for prevention of recurrent vaso-occlusive crises (VOCs) available for use in Europe*
- *Clinical data showed that use of Adakveo led to a significant reduction in the rate of VOCs and to fewer days spent in hospital*
- *VOCs disrupt patients' lives physically, socially, and emotionally – and can increase risk of organ damage and early death*

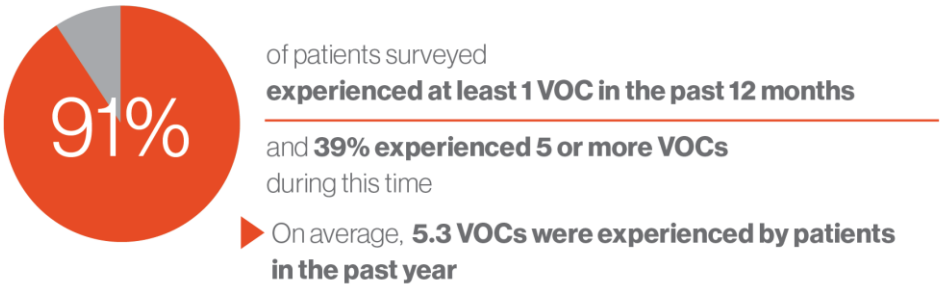
Basel, October 30, 2020 — Novartis today announced that the European Commission (EC) has approved Adakveo® (crizanlizumab) for the prevention of recurrent vaso-occlusive crises (VOCs), or pain crises, in patients with sickle cell disease aged 16 years and older.[1] Adakveo can be given as an add-on therapy to hydroxyurea/hydroxycarbamide (HU/HC) or as monotherapy in patients for whom HU/HC is inappropriate or inadequate.

Adakveo binds to P-selectin, a cell adhesion protein that plays a central role in the multicellular interactions that can lead to vaso-occlusion.[2,3] Sickle cell disease is considered a rare blood condition, affecting about 50,000 people in Europe.[4,5]

"Data shows that nine out of ten people living with sickle cell disease experience one or more VOCs in a year, with a third of those crises leading to hospitalization, underscoring the significant unmet need among a vulnerable group of patients," said Kees Roks, Head Region Europe, Novartis Oncology. "Just one VOC could be catastrophic for the patient, so preventing these sudden, unpredictable and life-threatening events is hugely important. Today's decision gives people living with sickle cell disease a chance to achieve that goal."

About Sickle Cell Disease

Patients who completed the Sickle Cell World Assessment Survey, sponsored by Novartis, reported substantially higher numbers of VOCs than current published data, **suggesting VOCs are underreported**



Reference: Osunkwo I, Andemariam B, Inusa B, et al. Management Strategies and Satisfaction Levels in Patients With Sickle Cell Disease: Interim Results From the International Sickle Cell World Assessment Survey (SWAY). Poster presented at: The American Society of Hematology Annual Meeting; December 7-10, 2019; Orlando, FL.

The approval follows a positive opinion by the Committee for Medicinal Products for Human Use (CHMP) in July based on results of the SUSTAIN trial, which showed that Adakveo significantly lowered the median annual rate of VOCs to 1.63 vs 2.98 compared with placebo (*P*=.010), equivalent to a 45% reduction. There was also a greater than two-fold increase in the proportion of patients with no VOCs who completed the study, compared to placebo. Reductions in the frequency of VOCs were observed among patients regardless of sickle cell disease genotype and/or hydroxyurea/hydroxycarbamide (HU/HC) use. In the same study, Adakveo was shown to reduce the median annual rate of days hospitalized by 42% (4.0 days for Adakveo vs. 6.87 days for placebo).[6] Read more about the positive CHMP opinion and the SUSTAIN clinical trial results **here**.

About Adakveo

Adakveo® (crizanlizumab) – previously known as SEG101 – is indicated for the prevention of recurrent VOCs in patients with sickle cell aged 16 years and older. It can be given as an add-on therapy to HU/HC or as monotherapy in patients for whom HU/HC is inappropriate or inadequate. It is the first and only targeted biologic that works by binding to P-selectin, a cell adhesion protein that plays a central role in the multicellular interactions that can lead to vaso-occlusion in sickle cell disease. By binding to P-selectin on the surface of the activated endothelium and platelets, Adakveo blocks interactions between endothelial cells, platelets, red blood cells, and leukocytes.

Adakveo is now approved in 36 countries around the world including the United States and European Union member states.

Important Safety Information

Adakveo may cause serious side effects, including infusion-related reactions. Infusion-related reactions may happen within 24 hours of receiving an infusion of Adakveo. Patients should tell their doctor or nurse immediately if they experience any of the following, which may be signs and symptoms of an infusion-related reaction, such as fever, chills or shivering, nausea, vomiting, tiredness, dizziness, sweating, hives, itching, shortness of breath or wheezing, or pain. In the event of a severe reaction, crizanlizumab should be discontinued and appropriate therapy should be instituted.

The most common side effects (incidence > 10%) were arthralgia, nausea, back pain, pyrexia, and abdominal pain. Other side effects which may affect up to 1 in every 10 people are diarrhea, itching (including vulvovaginal itching), vomiting, muscle pain (myalgia), pain in the muscles or bones of the chest (musculoskeletal chest pain), sore

throat (oropharyngeal pain), and redness or swelling and pain at the site of the infusion.

Adakveo may interfere with a laboratory test used to measure the number of platelets in the blood. Patients should tell their doctor or nurse that they are on treatment with Adakveo. It is recommended to run the tests as soon as possible (within 4 hours of blood collection) or use tubes containing citrate.

It is preferable to avoid the use of Adakveo during pregnancy and in women of childbearing potential not using contraception.

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