Luxturna®* gene therapy for *RPE65* mutation-associated inherited retinal disease

What are inherited retinal diseases?

Inherited retinal diseases are a group of rare conditions that can lead to total blindness, often disproportionally affecting children and young adults[1].

What is *RPE65* mutation-associated inherited retinal disease?

RPE65 is one of more than 260 genes that may be responsible for an inherited retinal disease[2]. Mutations in both copies of the *RPE65* gene can lead to total blindness[1].

Early in the disease patients can suffer from night blindness (nyctalopia), loss of light sensitivity, loss of peripheral vision, loss of sharpness or clarity of vision, impaired dark adaptation and repetitive uncontrolled movements of the eye (nystagmus)[3].

Who has *RPE65* mutation-associated retinal disease?

Mutations in both copies of the *RPE65* gene affect approximately 1 in 200,000 people[4]. Nearly 60% of patients have severe forms of the disease, with severe visual impairment occurring shortly after birth[5].

How are patients diagnosed?

Patients with mutations in both copies of the *RPE65* gene may be diagnosed with subtypes of either Leber congenital amaurosis or retinitis pigmentosa[6].

Tests used to diagnose retinitis pigmentosa or Leber congenital amaurosis include retinal slit lamp exams, electroretinograms and visual field tests[3]. A genetic test is necessary to confirm that vision loss is due to mutations in the *RPE65* gene[7].

What treatments exist?

In the EU, Luxturna is the only approved treatment for vision loss due to a genetic mutation in both copies of the *RPE65* gene. Outside the US and the EU, there are currently no approved treatment options for vision loss caused by *RPE65* mutations.

Luxturna (voretigene neparvovec)

What is Luxturna?

Luxturna (voretigene neparvovec), known as voretigene neparvovec-rzyl in the United States, is one-time gene therapy for the treatment of patients with vision loss due to a genetic mutation in both copies of the *RPE65* gene[7]. Luxturna provides a working copy of the *RPE65* gene to act in place of the mutated *RPE65* gene[7]. This working gene can restore vision and improve sight[7]. Luxturna is administered as a single injection below the retina in patients who have confirmed *RPE65* mutations and viable retinal cells[7].

What safety and efficacy data support Luxturna?**

The use of Luxturna is supported by data from a Phase 1 clinical trial, its follow-up trial, and a Phase 3 trial that enrolled 43 patients with *RPE65* mutation-associated inherited retinal disease[7]. The Phase 3 trial was the first randomized, controlled Phase 3 gene therapy trial for an inherited disease[7].

In the Phase 3 trial, the vision of patients treated with Luxturna improved by 1.6 light levels at 1 year on the binocular multi-luminance mobility test (MLMT), the trial's novel, patient-centric, primary endpoint[1].

The MLMT measures changes in patient relevant functional vision by asking patients to navigate a course accurately and at a reasonable pace at seven different levels of illumination, ranging from 400 lux (corresponding to a brightly lit office) to one lux (corresponding to a moonless summer night)[1]. Vision improved by one or more light levels for 90% of patients treated with Luxturna, and 65% were able to successfully navigate the MLMT at the lowest light level of 1 lux at 1 year[1].

*Luxturna is a trademark of Spark Therapeutics, Inc. in the United States.
** Important Safety Information: Some patients who received Luxturna experienced red or painful eyes, sensitivity to light, an eye infection, cataracts, increased pressure in the eye, or temporary visual disturbances, like flashes or floaters, worsening of or blurred vision. Some of these may be related to the procedure used to inject Luxturna. This information is not comprehensive. For full information please see the EU Summary of Product Characteristics.

References

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