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Committee for Orphan Medicinal Products

Public summary of opinion on orphan designation

Xenon for the treatment of ischaemia reperfusion injury associated with cardiac arrest

On 14 October 2016, orphan designation (EU/3/16/1768) was granted by the European Commission to Neuroprotexeon Ltd, United Kingdom, for xenon for the treatment of ischaemia reperfusion injury associated with cardiac arrest.

What is ischaemia reperfusion injury associated with cardiac arrest?

Cardiac arrest is when the heart suddenly stops beating and blood circulation around the body stops. Because blood carries oxygen to the organs of the body, during cardiac arrest the tissues are deprived of the oxygen they need. This lack of oxygen is called ischaemia, and quickly produces various changes in the tissue. When heartbeat and circulation are restored by cardiopulmonary resuscitation (CPR), then the sudden flow of oxygen-rich blood to oxygen-starved tissues (reperfusion) can result in damage to vital organs such as the brain, heart and kidneys. Up to half of all patients may subsequently die from organ failure or may never regain consciousness.

Ischaemia reperfusion injury associated with cardiac arrest is a life-threatening and long-term debilitating condition due to the damage to many organs including brain, heart and kidneys.

What is the estimated number of patients affected by the condition?

At the time of designation, ischaemia reperfusion injury associated with cardiac arrest affected approximately 4 in 10,000 people in the European Union (EU). This was equivalent to a total of around 205,000 people*, and is below the ceiling for orphan designation, which is 5 people in 10,000. This is based on the information provided by the sponsor and the knowledge of the Committee for Orphan Medicinal Products (COMP).

*Disclaimer: For the purpose of the designation, the number of patients affected by the condition is estimated and assessed on the basis of data from the European Union (EU 28), Norway, Iceland and Liechtenstein. This represents a population of 513,700,000 (Eurostat 2016).

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What treatments are available?

At the time of designation, there were no satisfactory methods of treatment approved in the EU for ischaemia reperfusion injury after cardiac arrest. Patients in a coma were generally managed by supportive care including lowering their body temperature (hypothermia or targeted temperature management).

How is this medicine expected to work?

Xenon is a gas found in the atmosphere in very small amounts that can be used as an anaesthetic (to produce unconsciousness during surgery). It stabilises cells such as those in the brain and heart by altering the movement of potassium and other substances in and out of these cells. It is also known to protect nerve cells from the consequences of damage that occurs, for example, when nerve cells are starved of oxygen. In addition, it can block the action of NMDA receptors, proteins in nerve cells which have been found to be overactive in many disease processes, including nerve cell death. Through a combination of these actions, xenon is expected to provide some protection against the damage to organs such as the brain and heart following ischaemia and reperfusion.

What is the stage of development of this medicine?

The effects of xenon have been evaluated in experimental models.

At the time of submission of the application for orphan designation, clinical trials with xenon in patients with ischaemia reperfusion injury after cardiac arrest were ongoing.

At the time of submission, xenon was authorised in the EU for use as a general anaesthetic. At the time of submission, it was not authorised anywhere in the EU for ischaemia reperfusion injury after cardiac arrest. Orphan designation had been granted in the United States for treatment of out-of-hospital cardiac arrest as well as in both the EU and the United States for the treatment of perinatal asphyxia (interruption of oxygen supply to the baby during birth).

In accordance with Regulation (EC) No 141/2000 of 16 December 1999, the COMP adopted a positive opinion on 8 September 2016 recommending the granting of this designation.

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Opinions on orphan medicinal product designations are based on the following three criteria:

- the seriousness of the condition;
- the existence of alternative methods of diagnosis, prevention or treatment;
- either the rarity of the condition (affecting not more than 5 in 10,000 people in the EU) or insufficient returns on investment.

Designated orphan medicinal products are products that are still under investigation and are considered for orphan designation on the basis of potential activity. An orphan designation is not a marketing authorisation. As a consequence, demonstration of quality, safety and efficacy is necessary before a product can be granted a marketing authorisation.

For more information

Sponsor's contact details:

Contact details of the current sponsor for this orphan designation can be found on EMA website, on the medicine's rare disease designations page.

For contact details of patients' organisations whose activities are targeted at rare diseases see:

- Orphanet, a database containing information on rare diseases, which includes a directory of patients' organisations registered in Europe;
- European Organisation for Rare Diseases (EURORDIS), a non-governmental alliance of patient organisations and individuals active in the field of rare diseases.

Translations of the active ingredient and indication in all official EU languages[1], Norwegian and Icelandic

Language	Active ingredient	Indication
English	Xenon	Treatment of ischaemia reperfusion injury associated with cardiac arrest
Bulgarian	Ксенон	Лечение на исхемично-реперфузионно увреждане свързано със сърдечен арест
Croatian	Ksenon	Liječenje ishemije reperfuzijske ozljede povezane sa srčanim zastojem
Czech	Xenon	Léčba ischemicko-reperfuzního poškození při zástavě srdce
Danish	Xenon	Behandling af iskæmisk reperfusionsskade associeret med hjertestop
Dutch	Xenon	Behandeling van ischemie reperfusie lesie geassociëerd aan hartstilstand
Estonian	Xenoon	Südame seiskumisega seotud isheemilise reperfusiooni kahjustuse ravi
Finnish	Xenon	Sydänpysähdykseen liittyvän iskeemisen reperfuusiovaurion hoito
French	Xénon	Traitement des blessures de reperfusion ischémique associées à un arrêt cardiaque
German	Xenon	Behandlung des Ischämie-Reperfusionsschaden assoziiert mit Kreislaufstillstands
Greek	Ξένο	Θεραπεία της βλάβης από ισχαιμία-επανάρδευση που σχετίζεται με την καρδιακή ανακοπή.
Hungarian	Xenon	Szívrohamhoz kapcsolódó iszkémia reperfúziós károsodás kezelése
Italian	Xenon	Trattamento del danno da ischemia e riperfusione associate all'arresto cardiaco
Latvian	Ksenons	Ar sirds apstāšanos saistītu išēmijas-reperfūzijas bojājumu ārstēšana
Lithuanian	Ksenonas	Išeminio reperfuzinio pažeidimo, susijusio su širdies sustojimu, gydymas
Maltese	Xenon	Kura tad-dannu minn riperfusjoni wara iskemija assoċjat ma' attakk tal-qalb
Polish	Ksenon	Leczenie zespołu poreperfuzyjnego związanego z zatrzymaniem akcji serca
Portuguese	Xenon	Tratamento da lesão de isquémia e de reperfusão associada à paragem cardíaca
Romanian	Xenon	Tratamentul leziunii ischemice de reperfuzie associate cu stopul cardiac
Slovak	Xenon	Liečba ischemického reperfúzneho poškodenia spojeného so srdcovou zástavou
Slovenian	Ksenon	Zdravljenje reperfuzijske poškodbe po ishemiji ob srčnem zastoju

[1] At the time of designation

Language	Active ingredient	Indication
Spanish	Xenon	Tratamiento de la lesion de isquemia reperfusion asociada a un paro cardiaco
Swedish	Xenon	Behandling av iskaemisk reperfusionsskada associerad med hjärtstillestånd
Norwegian	Xenon	Behandling av iskemisk reperfusjonsskade etter hjertestans
Icelandic	Xenón	Meðferð við blóðþurðar endurperfusion skaða tengdum hjartastoppi