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Committee for Orphan Medicinal Products

Public summary of opinion on orphan designation

2,2-dimethylbutyric acid, sodium salt for the treatment of sickle cell disease

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Disclaimer

Please note that revisions to the Public Summary of Opinion are purely administrative updates. Therefore, the scientific content of the document reflects the outcome of the Committee for Orphan Medicinal Products (COMP) at the time of designation and is not updated after first publication.

On 18 March 2009, orphan designation (EU/3/09/621) was granted by the European Commission to Isabelle Ramírez, Germany, for 2,2-dimethylbutyric acid, sodium salt for the treatment of sickle cell disease.

What is sickle cell disease?

Sickle cell disease is a genetic disease in which the red blood cells become rigid and sticky, and change from being disc-shaped to being crescent-shaped (like a sickle). The change in shape is caused by the presence of an abnormal form of haemoglobin, the protein in red blood cells that carries oxygen around the body. In patients with sickle cell disease, the abnormal red blood cells attach to walls of blood vessels and block them, restricting the flow of nutrients and oxygen to the internal organs, such as the heart, the lungs, and the spleen. This causes severe pain and damage to these organs. Because the abnormal red blood cells have a shorter life span, the disease also causes anaemia (low red blood cell counts).

Sickle cell disease is a severe disease that is long lasting and may be life threatening because of its effects on the heart and the lungs.

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

At the time of designation, sickle cell disease affected less than 1 in 10,000 people in the European Union (EU). This was equivalent to a total of fewer than 50,000 people*, and is below the ceiling for

*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 27), Norway, Iceland and Liechtenstein.
At the time of designation, this represented a population of 504,800,000 (Eurostat 2009).

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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).

What treatments are available?

At the time of designation, there was one medicine authorised for sickle cell disease in the EU. The main treatment for sickle cell disease was blood transfusion. This was usually combined with iron chelators, medicines used to reduce the high iron levels in the body caused by repeated blood transfusions. In some cases, bone marrow transplant was used (a complex procedure where the bone marrow of the patient is destroyed and replaced with bone marrow from a matched donor) to allow the patient to produce red blood cells containing normal haemoglobin.

The sponsor has provided sufficient information to show that 2,2-dimethylbutyric acid, sodium salt might be of significant benefit for the patients because of the way the medicine is expected to work. 2,2-Dimethylbutyric acid, sodium salt could be an alternative treatment for sickle cell disease, or may be used in combination with existing treatments. This assumption will need to be confirmed at the time of marketing authorisation, in order to maintain the orphan status.

How is this medicine expected to work?

2,2-Dimethylbutyric acid, sodium salt is expected to increase the amount of haemoglobin in the blood by stimulating the production of foetal haemoglobin. Foetal haemoglobin is the main type of haemoglobin found in unborn children. The levels of foetal haemoglobin usually decrease to around 1% of the total haemoglobin by the end of the second year of life. In sickle cell disease, foetal haemoglobin is expected to replace the abnormal haemoglobin in red blood cells following treatment with 2,2-dimethylbutyric acid, sodium salt. This will stop the red blood cells changing their shape, reducing the risk of blood vessels becoming blocked.

What is the stage of development of this medicine?

The effects of 2,2-dimethylbutyric acid, sodium salt have been evaluated in experimental models.

At the time of submission of the application for orphan designation, clinical trials in healthy volunteers were ongoing.

At the time of submission, 2,2-dimethylbutyric acid, sodium salt was not authorised anywhere in the EU for sickle cell disease.

Orphan designation of the medicine had been granted in the United States of America for this condition.

In accordance with Regulation (EC) No 141/2000 of 16 December 1999, the COMP adopted a positive opinion on 9 February 2009 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

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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	2,2-dimethylbutyric acid, sodium salt	Treatment of sickle cell disease
Bulgarian	2,2-диметил-бутирова(маслена)киселина, натриева сол	Лечение на сърповидно-клетъчна анемия
Czech	2,2-dimetyl kyselina máslová, sodíková sůl	Léčba srpkovité anémie
Danish	2,2-dimethyl-butansyre, natriumsalt	Behandling af seglcellesygdom
Dutch	2,2-dimethylbutaanzuur, natriumzout	Behandeling van sikkelcelaandoening
Estonian	2,2-dimetüülvõihappe naatriumsool	Sirprakulise aneemia ravi
Finnish	2,2-(dimetyyli)voihappo, natriumsuola	Sirppisolusyndrooman hoito
French	Acide 2,2-diméthylbutyrique, sel de sodium	Traitement du syndrome drépanocytaire
German	2,2-Dimethylbuttersäure, Natriumsalz	Behandlung der Sichelzellenanämie
Greek	2,2-διμεθυλοβουτυρικό οξύ, άλας του νατρίου	Θεραπεία της δρεπανοκυτταρικής αναιμίας
Hungarian	2,2-dimetil-vajsav, nátriumsó	Sarlósejtes anaemia kezelése
Italian	2,2-dimetilbutirrato sodico	Trattamento dell'anemia falciforme
Latvian	2,2-dimetilsviestskābes nātrija sāls	Sirpjveida šūnu anēmijas ārstēšana
Lithuanian	2,2-dimetilsviesto rūgštis, natrio druska	Siklemijos gydymas
Maltese	2,2-dimethylbutyric acid, sodium salt	Kura tal-marda taċ-ċelluli sura ta' minġel
Polish	Sól sodowa kwasu 2,2-dimetylomasłowego	Leczenie niedokrwistości sierpowatokrwinkowej
Portuguese	Ácido 2,2-dimetilbutírico, sal sódico	Tratmento do sindrome das células falciformes
Romanian	Acid 2,2-dimetilbutiric, sare de sodiu	Tratamentul anemiei cu celule falciforme
Slovak	Kyselina 2,2-dimetylmaslová, sodná soľ	Liečba kosáčikovej anémie
Slovenian	2,2-dimetilbutanojska kislina, natrijeva sol	Zdravljenje bolezni srpastih celic
Spanish	Ácido 2,2-dimetilbutírico, sal sódica	Tratamiento de la anemia drepanocítica
Swedish	2,2-dimetylsmörsyra, natriumsalt	Behandling av sickle cell syndrom
Norwegian	2,2-dimetylbutansyre, natriumsalt	Behandling av sigdcellesykdom
Icelandic	2,2-dímetýlbútansýra, natríumsalt	Meðferð sigðkornablóðleysis

[1] At the time of designation