



EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

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Public summary of the evaluation of the proposed paediatric investigation plan

(S)-Pyrrolidine-2-carboxylic acid compound with (2S,3R,4R,5S,6R)-2-(3-((2,3-dihydrobenzo[b][1,4]dioxin-6-yl)methyl)-4-ethylphenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol (2:1) for treatment of type 2 diabetes mellitus

On 20 June 2014, the Paediatric Committee of the European Medicines Agency agreed a Paediatric Investigation Plan* (PIP) for (S)-Pyrrolidine-2-carboxylic acid compound with (2S,3R,4R,5S,6R)-2-(3-((2,3-dihydrobenzo[b][1,4]dioxin-6-yl)methyl)-4-ethylphenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol (2:1) (LIK066) for treatment of type 2 diabetes mellitus (EMA-001527-PIP01-13).

What is (S)-Pyrrolidine-2-carboxylic acid compound with (2S,3R,4R,5S,6R)-2-(3-((2,3-dihydrobenzo[b][1,4]dioxin-6-yl)methyl)-4-ethylphenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol (2:1) and how is it expected to work?

(S)-Pyrrolidine-2-carboxylic acid compound with (2S,3R,4R,5S,6R)-2-(3-((2,3-dihydrobenzo[b][1,4]dioxin-6-yl)methyl)-4-ethylphenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol (2:1) is not authorised in the European Union. Studies in adults are currently on-going. This medicine is proposed in adults for the treatment of type 2 diabetes mellitus.

(S)-Pyrrolidine-2-carboxylic acid compound with (2S,3R,4R,5S,6R)-2-(3-((2,3-dihydrobenzo[b][1,4]dioxin-6-yl)methyl)-4-ethylphenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol (2:1) is a dual inhibitor of the sodium glucose co-transporters one and two (SGLT-1 and -2). Inhibition of SGLT-1 and -2 leads to inhibition of glucose reabsorption from the kidney and potentially glucose absorption in the intestine. This may improve post-prandial glycaemia.

What was the proposal from the applicant?

For children, the applicant proposed:

To study the medicine in children from 10 years to less than 18 years of age affected by type 2 diabetes mellitus, in a paediatric investigation plan*. The future indication proposed for children is



treatment of type 2 diabetes mellitus. The plan includes a proposal to show efficacy and safety of the medicine in clinical studies.

The applicant proposed a deferral* for the paediatric clinical studies.

Is there a need to treat children affected by type 2 diabetes mellitus?

Taking into account the proposed indication in adults, and the characteristics of the medicine, the Paediatric Committee considered this medicine of potential use for the treatment of type 2 diabetes mellitus. This condition occurs also in children, and affects in particular adolescents.

What did the Paediatric Committee conclude on the potential use of this medicine in children?

At present, some treatments are available for the treatment of type 2 diabetes mellitus in children in the European Union, such as diet and exercise, metformin and insulin that are known to work. Therefore, the Committee considered that new data are required to decide whether the use of this medicine will bring a benefit to children from 10 to less than 18 years affected by the condition, and to understand any potential risks.

Because there is a need for more medicines for the treatment of type 2 diabetes mellitus in children, and this medicine has a potential interest for children, the Committee considered that clinical studies were necessary.

The Committee considered that it is more prudent to confirm that the medicine is effective and safe in adults, before starting the paediatric studies. Therefore, the Committee agreed with the request of the applicant that the paediatric clinical studies should be deferred.

What is the content of the Plan after evaluation?

The Paediatric Committee considered that:

- Studies are not necessary in children below 10 years of age because the disease does not occur in this specific paediatric subsets.
- Determination of the best dose should be done with one trial of the medicine's behaviour in the body and the body's reactions to it.
- It is necessary to study if the medicine is efficacious to treat the disease in children. This will be done in one study comparing the medicine to placebo* in an add-on to standard of care setting.
- It is necessary to study the potential side effects of the medicine, to prevent them or to reduce the consequences if they occur. The main concern identified by the PDCO is the potential toxicity of the medicine for bone growth, renal function (including nephrocalcinosis) and the risk for genitourinary infections.

What happens next?

The applicant has now received the EMA Decision* on this medicine. The Decision itself is necessary for the applicant to request in the future a marketing authorisation* for this medicine in adults and/or in children.

The Decision* on the agreed Paediatric Investigation Plan means that the applicant will perform the studies and trials in the next months or years. In case of difficulties, or a change in current knowledge

or availability of new data, the applicant may request changes to the plan at a later stage. This can be done through a modification of the PIP.

The agreed completion of all the studies and trials included in the Paediatric Investigation Plan is December 2029.

Trials in the Paediatric Investigation Plan will be listed in the public EU Clinical Trials Register (<https://www.clinicaltrialsregister.eu/>) as soon as they have been authorised to be started, and their results will have to be listed in the register within 6 months after they have completed.

The results of the studies conducted in accordance with the agreed Paediatric Investigation Plan will be assessed, and any relevant information will be included in the Product Information (summary of product characteristics, package leaflet). If the medicine proves to be efficacious and safe to use in children, it can be authorised for paediatric use, with appropriate recommendations on the dose and on necessary precautions. The product information will also describe which adverse effects are expected with the medicine, and wherever possible, how to prevent or reduce these effects.

***Definitions:**

Applicant	The pharmaceutical company or person proposing the Paediatric Investigation Plan or requesting the Product-Specific Waiver
Children	All children, from birth to the day of the 18 th birthday.
Paediatric investigation plan (PIP)	Set of studies and measures, usually including clinical studies in children, to evaluate the benefits and the risks of the use of a medicine in children, for a given disease or condition. A PIP may include “partial” waivers (for example, for younger children) and/or a deferral (see below).
Waiver	An exemption from conducting studies in children, for a given disease or condition. This can be granted for all children (product-specific waiver), or in specific subsets (partial waiver): for example, in boys or in children below a given age.
Deferral	The possibility to request marketing authorisation for the use of the medicine in adults, before completing one or more of the studies /measures included in a PIP. The Paediatric Committee may grant a deferral to avoid a delay in the availability of the medicine for adults.
Opinion	The result of the evaluation by the Paediatric Committee of the European Medicines Agency. The opinion may grant a product-specific waiver, or agree a PIP.
Decision	The legal act issued by the European Medicines Agency, which puts into effect the Opinion of the Paediatric Committee.
Pharmaceutical form	The physical aspect of the medicine (the form in which it is presented), for example: a tablet, capsule, powder, solution for injection, etc. A medicine can have more than one pharmaceutical form.
Placebo	A substance that has no therapeutic effect, used as a control in testing new drugs.
Active control	A medicine with therapeutic effect, used as a control in testing new drugs.
Historical control	A group of patients with the same disease, treated in the past and used in a comparison with the patients treated with the new drug.
Route of administration	How a medicine is given to the patient. For example: for oral use, for intramuscular use, for intravenous use, etc. The same medicine, or the same pharmaceutical form, may be given through more than one route of administration.
Patent	A form of protection of intellectual property rights. If a medicinal product is protected by a patent, the patent holder has the sole right to make, use, and sell the product, for a limited period. In certain circumstances, a patent for a medicinal product may be extended for a variable period by a Supplementary Protection Certificate.
Marketing Authorisation	When a Marketing Authorisation is granted, the pharmaceutical company may start selling the medicine in the relevant country (in the whole European Union, if the procedure was a centralised one).