



TECHNOLOGY INFO SHEET



Pharmaceutical composition comprising a ryanodine receptor antagonist for facilitating wound healing

Development status

Proof of concept

► Development

Product development and Testing

Entering to market

Market development

IP status

In priority year

PCT I.

PCT II.

► National/regional phase

Validation

Challenge

Delayed wound healing places substantial burden on healthcare systems and considerably decreases health-related quality of life. Several factors may influence the process of regeneration and lead to chronic wounds (e.g. impaired blood supply, infections and prolonged inflammation). Special attention shall be paid to the blood supply, because microcirculatory failure belongs to the reasons of diabetes-related chronic wounds. Many treatments have been developed to support healing (e.g. silver, advanced dressings, growth factors, etc.); some of them may improve microcirculation and/or oxygen supply (e.g. negative pressure wound devices, hyperbaric- and topical oxygen treatment) but they are expensive or require special infrastructure or devices. Researchers at the University of Szeged introduced a novel, easy and cost-effective pharmacological treatment for the improvement of microcirculation and acceleration of wound healing.

Technology

Local application of dantrolene supports the healing of full-thickness dermal wounds in animal model. The experiments were performed on male SKH-1 hairless mice. A skin fold was formed in the dorsal region and was fixed with two symmetrical fenestrated titanium frames ("skin fold chamber model"). A circular full-thickness wound was made on the area of the skin fold and received topical dantrolene treatment (once a day) during 20 days of the observation period. Photographs were taken in order to assess the rate of wound closure. Microcirculation of the wound was monitored with intravital videomicroscopy and laser Doppler flowmetry. Tissue samples were collected for routine histology and biochemical measurements.

According to the results, locally applied dantrolene significantly increased the rate of wound closure, epithelialization and dermal regeneration during the first part of the observation period.

Intravital videomicroscopy has revealed that dantrolene increased the average vessel diameter in the wound and also increased the velocity of red blood cells in the capillaries. Laser Doppler measurement has shown a considerable elevation of blood flow after application of dantrolene. Furthermore, dantrolene significantly decreased the activity of xanthine oxydase enzyme which is an indicator of free radical production.

Keywords

Dantrolene, wound care, microcirculation

Benefits

- ▶ As a muscle relaxant, dantrolene is approved by FDA and the appropriate European and Hungarian Authorities, thus preclinical dossier can be spared.
- ▶ Dantrolene increases the rate of wound closure, epithelialization and dermal regeneration.
- ▶ It can be used locally in such wounds which originate in impaired microcirculation e.g. diabetic ulcers.
- ▶ It is a cost-effective and easy to use method.

Development status

In vitro test are currently running to clarify the metabolic processes within the cells. Besides, further animal experiments will be carried out in order to study the exact mechanism of actions of dantrolene on wound healing in diabetic mice.

IP status

The Hungarian patent application (P1300720) was submitted in 2013.

PCT examination (PCT/HU2014/00124) was submitted in 2014. PCT examination was extended to US (US 15/103,374), Europe (EP 14837102.4), India (201647023609) and China (201480075392.6) in 2016.

Registration of European patent application No. 14837102.4 in Hong Kong, pending (Filing number 17103927.3).

The US patent was granted in 2017.

What we are looking for

The University is looking for partners to start the human phases, firstly to complete the safety, efficacy studies and after to start the pharmacokinetic examination.

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