P-0467 – Preliminary Pilot Study: Timolol is Used to Treat Diabetic Foot Ulcers

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Background

Diabetic foot ulcer (DFU) seriously is one of the main causes of death and disability. Conventional methods are difficult to cure DFU. Directional migration of keratinocytes is vital for wound re-epithelialization. β 2AR antagonists have been reported to promote wound healing by improving keratinocyte migration. In addition, β 2AR antagonists can also promote angiogenesis. But now there is still few clinical study. The purpose of this study was to observe whether timolol can promote the healing of diabetes refractory foot ulcers.

Methods

We describe twelve cases with diabetic foot ulcer who were taking part in Western China Hospital between Sep.2018 and Jul.2019. Timolol was local used to treat ulcers, and curative effect was observed.

Results

The average age of patients was 62.9 ± 10.2 years old, the median time of ulcer duration was 3.7 (1.0,7.3) months. According to Wagner grade, one patient was rated grade 2, three were grade 3 and eight were grade 4. The average ABI of unhealthy limb were 1.0 ± 0.3 . All patients have received conventional treatment, including debridement, local pressure offloading, anti-infective therapy, topical application of autologous platelet-rich gel. The average healing time was 68.0 ± 29.2 days. Ulcers area were narrowed, but healing was slowly. So giving 0.5% timolol eye drops to treat ulcers. Using one drop every 1cm² and once every 2 days. Then ulcers were covered by dry gauze. Among 12 patients, the wounds of 8 patients were healed completely, and the

healing median time was 12.0 (9.5, 26.0) days. The ulcer healing rate of another 4 patients was $78.9 \pm 19.7\%$ when they were discharged from hospital, and the observation median time was 11.0 (7.8, 15.3) days. For all patients, the average time when the ulcers area shrank by more than 50% was 5.6 ± 2.1 days.

Fig1 variation of the wound area during treatment. A: one week before using Timolol. B: at the begning of using Timolol. C: one week after using Timolol

Conclusions

For diabetic refractory foot ulcers, timolol was showed to promoted wound healing, which suggested β 2AB can improve healing in chronic wounds. However, Large sample multicenter randomized controlled study is needed to definite curative effect and mechanism of β 2AR antagonists.

Fig2. The therapeutic process of one patient. A: two weeks before using Timolol. B: one week before using Timolol. C: at the begning of using Timolol. D: one week after using Timolol. E: two weeks after using Timolol. F: three weeks after using Timolol