Low Power Laser Accelerates Wound Healing in Diabetic Rats

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Introduction

Diabetic wounds have been the area of challenge since many years with different approaches to improve the problem.
Nitric Oxide (NO) has been shown to play a crucial role in wound healing.
In addition, application of laser on wound healing has already examined.
Thus, this study was designed to Investigate the efficacy of low power laser Irradiation for dermal wound healing of diabetic rats.

Materials and Methods

In this study 36 male SD rats were used. Diabetes was induced by IP injection of STZ. A full-thickness circular wound was made on the back of all rats. Rats were selected to be irradiated directly on their wound with a combination of 670 nm (100 mw,2j/cm2) and 810nm (50mw, 1j/cm2) every other day. Wound imaging was performed on days 0,7,12,16,20 and 22. the wounds margin and context were scored pathologically NO was measured by NO-analyzer.

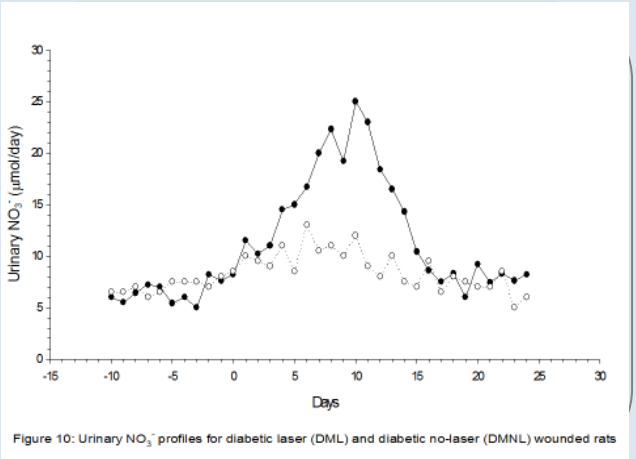
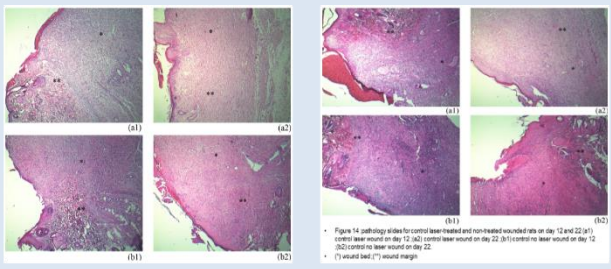
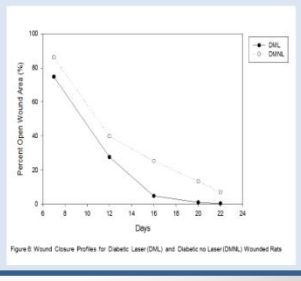


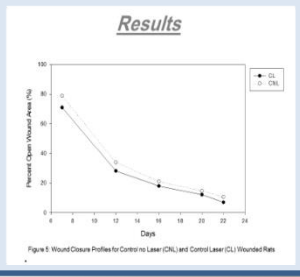
Figure 10: Urinary NO_3^- profiles for diabetic laser (DML) and diabetic no-laser (DMNL) wounded rats

Results

Percent open wound area (POWA) was significantly lower in diabetic laser group in comparison to the diabetic non-laser group in all measurement days. Also the POWA decrease in DML group was quicker than DMNL group (P=o.o21, mean difference=19.7% and P=0.013, respectively). NO production was increased in DML group as compared to DMNL group from 6-10 post-wounding (20.64 µmol/day for DML vs 11.3 mol/day for DMNL, P<0.05.







Conclusions

- It has been reported that NO production during wound healing is an index of healing. NO production was attenuated for DMNL
- Group but there was significant increase for DML group probably because of bio-stimulation of laser on impaired wounds. However, our study showed that the irradiation of diabetic wounds with a combination of low dose 670nm and 810nm lasers accelerates wound healing process in diabetic rats because of Bio-stimulatory effect on impaired wound with modulatory effect on normal wounds.
- Hence manipulation of wound by laser for NO synthesis and availability during wound healing may potentially lead to therapeutic results.

References

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