

LOW-LEVEL LASER THERAPY IN RESOLUTION OF FIBROTIC PROCESS AND SIGNALLING: NEW TOLL TO TISSUE REPAIR

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Background: Low-level laser therapy (LLLT) is a modulator of kidney fibrosis without evidences of side-effects. Herein we investigated the LLLT effect on chronic kidney disease from mice submitted to obstruction ureteral unilateral (UUO).

Study: Methods: Male C57/BL6 mice (22 g) were divided in 3 groups (n = 5) being them: basal, UUO, UUO + LASER. On day 0. Following UUO mice were treated with LLLT for 7 days and sacrificed in day 7 after UUO.

Results: LLLT shown to be effective to decrease M1 macrophages with reduction of mRNA expression IL-1 β , iNOS, CD86 compared to UUO group. In contrast, LLLT can increase the expression of Arg-1, FIZZ-1, YM-1 compared to UUO group and basal group. When we verified fibrotic process, we observed that LLLT reduced the mRNA expression of Col I, Col 4, TGF- β and MMP9 compared to UUO group. The values of protein/creatinine ratio were (0.96 \pm 0.08) in LLLT group and (2.99 \pm 0.32) in UUO, showing a preserved effect in renal function. This result is observed in total cell count with Sirius Red (LLLT 0.93 \pm 0.16) to (UUO 5.39 \pm 0.84).

Conclusion: In the fibrotic process, macrophages are recognized for their central role. Thus, the study of non-pharmacological and non-invasive tools that can modify the natural history of the development of fibrosis after renal initial insult is justified. In our study LLLT operates in different areas, so that there is a reduction in M1 profile, a control of production of M2 phenotype, reduced renal fibrotic process, and improved renal function frame with a non-invasive treatment without side effects, and low cost, we believe that LLLT act by modulating TGF beta pathways.