

EFFECT OF TRANSCUTANEOUS CARBON DIOXIDE THERAPY ON WOUND HEALING AND SKIN GRAFT ACCEPTANCE IN THE HORSE

One proposed mechanism of exuberant granulation tissue (EGT) formation is persistent hypoxia. Transcutaneous carbon dioxide therapy (CDT) is thought to stimulate angiogenesis and cause release of oxygen from hemoglobin, improving local oxygenation. The objective was to evaluate the effect of CDT on wound healing and skin graft acceptance in the horse. Three wounds were created on the dorsal aspect of each metacarpus of six horses. One forelimb of each horse received CDT while the contralateral limb was the control. Treatments were performed on days 1-5, and 7-14. Skin grafts were performed on the larger wounds at day 7. Wounds were assessed regularly by a blinded observer to determine granulation tissue grade. Biopsies were obtained on days 7 and 14, and were evaluated for degree of inflammation, epithelialization, angiogenesis, and fibrosis. Digital images were used to determine granulation tissue area at each time point. Statistical analysis was performed with mixed effects logistic regression. There was a significantly higher degree of angiogenesis in treated wounds than control wounds ($p < 0.003$). There was a trend towards a faster rate of healing in treated wounds. One limitation of this study is there may have been a systemic effect of the treatment, which could have effected healing in the control wounds. The use of CDT may be beneficial for the treatment of distal limb wounds healing by second intention by promoting angiogenesis and thus improved tissue oxygenation.

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