Transcutaneous Oxygen in Arms of Women with Unilateral Postmastectomy Lymphedema before and after Complete Decongestive Physiotherapy

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RESULTS AND CONCLUSIONS

Transcutaneous Oxygen and Tissue Properties

Main Research Findings

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ABSTRACT

Reports suggest that skin blood flow is reduced in arms of women with lymphedema due to breast cancer treatment. Since tissue oxygenation depends on blood flow, we sought to determine if transcutaneous oxygen tension (TcPO\textsubscript{2}) is also reduced and if so, if therapy that reduces edema also improves oxygenation. TcPO\textsubscript{2} was measured in fibrotic areas of edematous arms and in non-affected arms of 15 women with unilateral arm lymphedema before and after CDP therapy. Fibrosis was assessed by indentation recovery times (IRT) after applying an indentor-like device. Arm volumes and edema percentages were determined from circumferences using automated software calculations. Treatment significantly (p<0.01) reduced arm edema (mean±SD) from 28.6±22.9% to 18.1±17.7% and fibrotic segment edema from 42.6±30.1% to 25.0±20.4% and softened fibrotic tissue judged by reductions in IRT (88.7±60.7 sec vs. 23.1±38.8 sec, p<0.001). Surprisingly, TcPO\textsubscript{2} did not differ between arms initially and was unchanged by treatment, being 60.1±8.8 mmHg at the start and 61.8±9.2 mmHg after treatment. Thus, despite significant amounts of initial edema, TcPO\textsubscript{2} was not less in edematous arms nor was it changed by therapy that decreased edema. These findings suggest that for resting conditions, blood perfusion is adequate to prevent significant tissue oxygenation deficits.

Summary and Conclusions

In this study of a small group of post-mastectomy patients, treatment of the affected arm significantly reduced total arm and fibrotic segment edema and softened fibrotic tissue. However, despite significant amounts of initial edema of the affected arm, its TcPO\textsubscript{2} value was not initially less than in the non-affected contralateral arm nor was the affected arm’s TcPO\textsubscript{2} value changed by therapy. These findings suggest that for resting conditions, blood perfusion is adequate to prevent significant tissue oxygen deficits within the edema territory as determined by the present measures.