



Oksijen Tedavisi

Dr. Mesut MUTLUOĞLU

GATA Haydarpaşa Eğitim Hastanesi
Sualtı Hekimliği ve Hiperbarik Tıp Servisi

Yok



Çıkar çakışması

6. ULUSAL SUALTI HEKİMLİĞİ VE HİPERBARİK TIP KONGRESİ

12-13 Nisan 2013 İSTANBUL



Yara İyileşmesinde Topikal Oksijenin Yeri Vardır

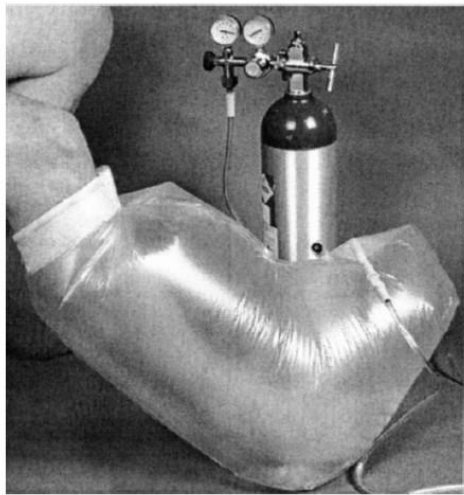
Mesut Mutluoğlu

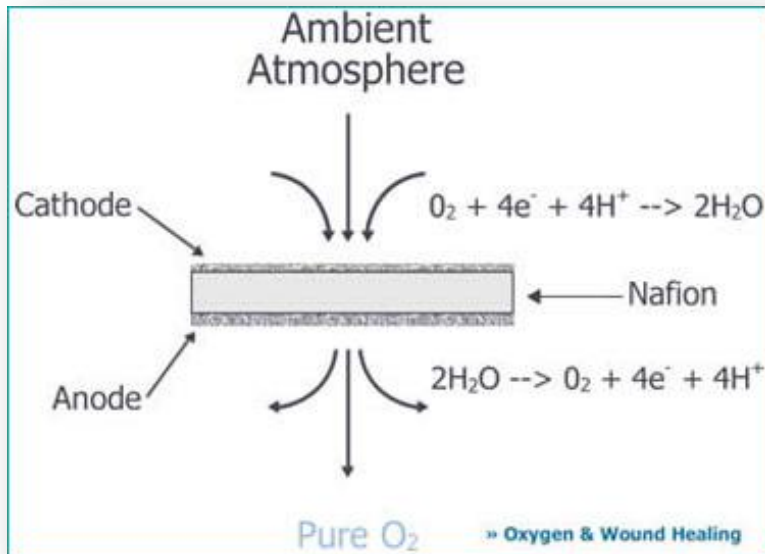
GATA Haydarpaşa Eğitim Hastanesi, Sualtı Hekimliği ve Hiperbarik Tıp Servisi

<http://www.sualti.org/tezler.html>









Treatment averages **49 days** to heal the wound at a cost of approximately
\$47 per day, or **\$2450 per patient**

Boguslav H.
Fischer

1969

40 kişi

Topikal
O₂



Introduction

THE beneficial effect of hyperbaric oxygen on some wounds and skin lesions ¹⁻⁴ suggested that similar effects might be expected if topical hyperbaric oxygen were used to treat skin ulcers and pressure sores.



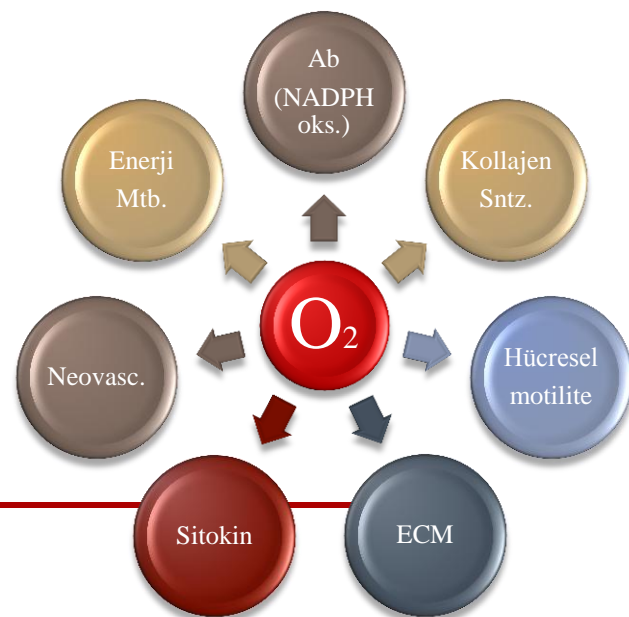
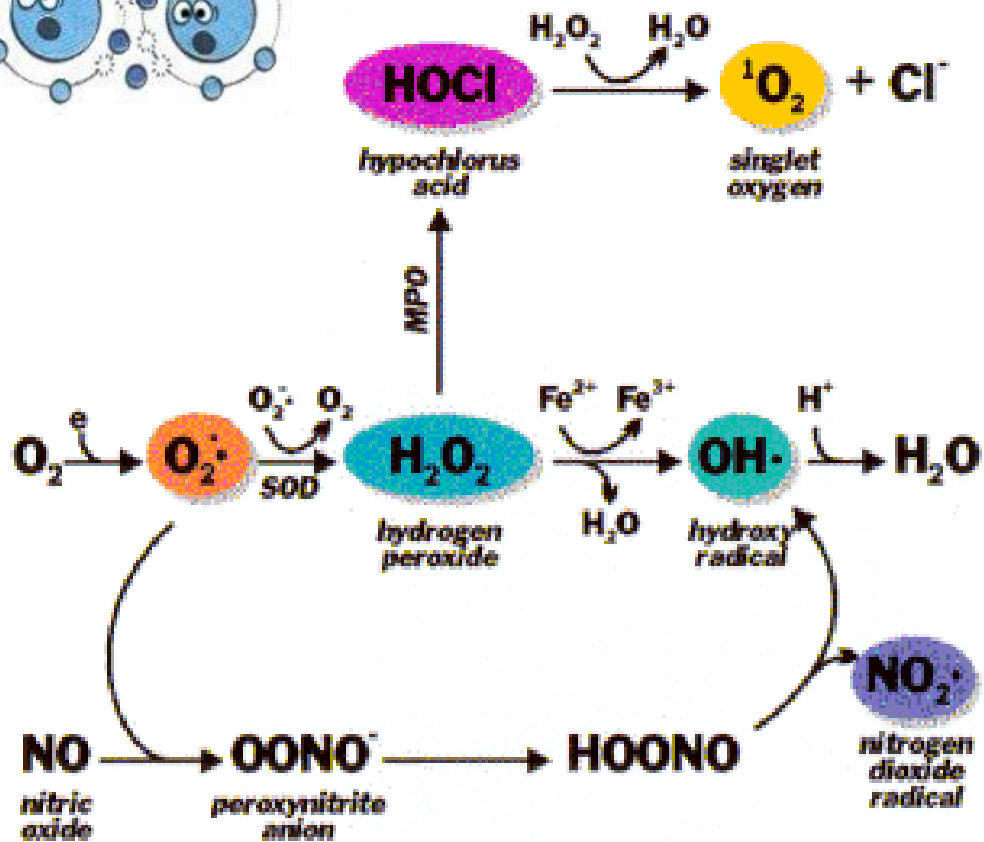
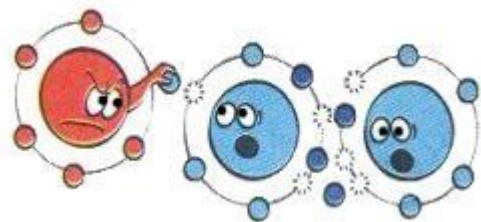
EDITORIAL

Topical oxygen is not hyperbaric oxygen (HBO₂).

C. A. PIANTADOSI

Interest in TOT is being rekindled by current scientific knowledge that cell signaling by reactive oxygen species (ROS), such as hydrogen peroxide, is involved in pathways that regulate cell growth, differentiation, and proliferation (5). Normal mammalian cells not only consume O₂ for metabolic purposes, but they generate ROS. Low level ROS production serves essential intra- and intercellular communication functions. Thus, basal ROS production offers certain advantages, such as facilitating adaptation to changes in milieu, and even promotes cell survival during times of stress.

The point of this discussion is that changes in wound PO₂ have important physiological implications that are independent of aerobic metabolism. Therapies involving minor or locally limited changes in PO₂ may have beneficial effects on wound healing. Therefore, topical application of O₂ to problem wounds, although likely to produce only minimal changes in tissue O₂ content relative to HBO₂, has a theoretical rationale. However, unlike HBO₂, a benefit of TOT on problem wound healing has never been demonstrated scientifically. TOT is not HBO₂T.

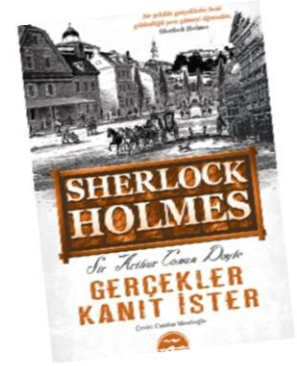


OKSIDATIF STRESS

THE THIN RED LINE



OKSIDATIF HASAR





Chandan K Sen

Wexner Medical Center at The Ohio State University

Tissue Injury and Repair - Wound Healing - Redox Biology - Regenerative Medicine - Vitamin E Tocotrienol

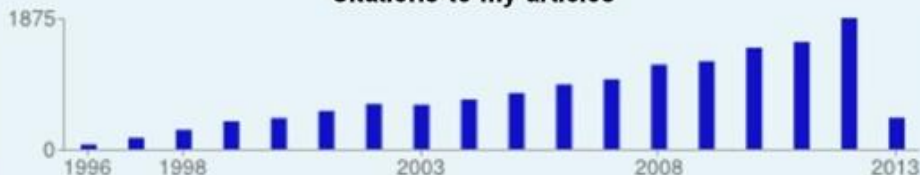
Verified email at osumc.edu

[Homepage](#)

Citation indices

	All	Since 2008
Citations	15037	7805
h-index	64	48
i10-index	201	167

Citations to my articles



Show: 20 1-20 Next >

Title / Author	Cited by	Year
Antioxidant and redox regulation of gene transcription. CK Sen, L Packer The FASEB journal 10 (7), 709-720	1743	1996
Oxidants and antioxidants in exercise CK Sen Journal of Applied Physiology 79 (3), 675-686	593	1995
Redox signaling and the emerging therapeutic potential of thiol antioxidants CK Sen Biochemical pharmacology 55 (11), 1747-1758	317	1998
Dermal excisional wound healing in pigs following treatment with topically applied pure oxygen RB Fries, WA Wallace, S Roy, P Kuppusamy, V Bergdall, GM Gordillo, WS Melvin ... Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis 579 (1 ...	60	2005



Available online at www.sciencedirect.com

SCIENCE @ DIRECT®

Mutation Research 579 (2005) 172–181

MNR

Fundamental and Molecular
Mechanisms of Mutagenesis

www.elsevier.com/locate/molmut

Community address: www.elsevier.com/locate/mutres

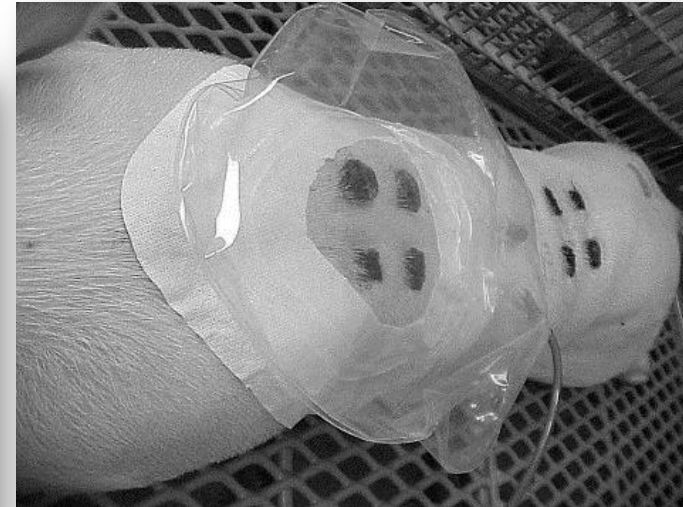
Dermal excisional wound healing in pigs following treatment with topically applied pure oxygen

Richard B. Fries, William A. Wallace, Sashwati Roy, Periannan Kuppasamy, Valerie Bergdall, Gayle M. Gordillo, W. Scott Melvin, Chandan K. Sen*

Laboratory of Molecular Medicine, Dorothy M. Davis Heart and Lung Research Institute and Comprehensive Wound Center,
Department of Surgery, The Ohio State University Medical Center, Columbus, OH 43210, USA

Received 11 February 2005; received in revised form 18 February 2005; accepted 18 February 2005

Available online 18 August 2005



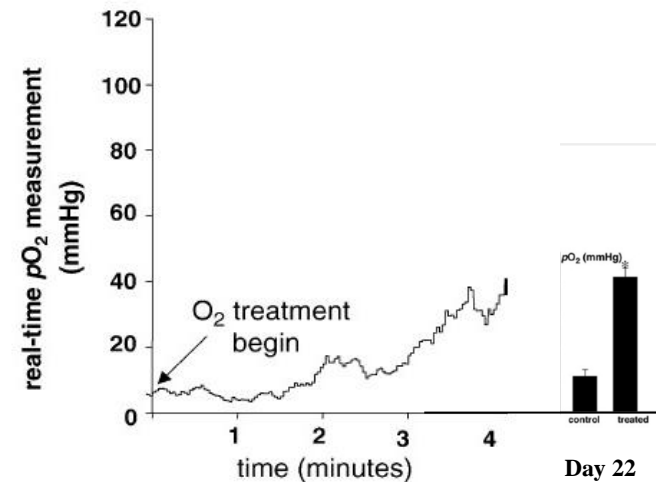
6 gün, günde 3 saat, 1 ATA, 3-6lt/dk
%100 o₂

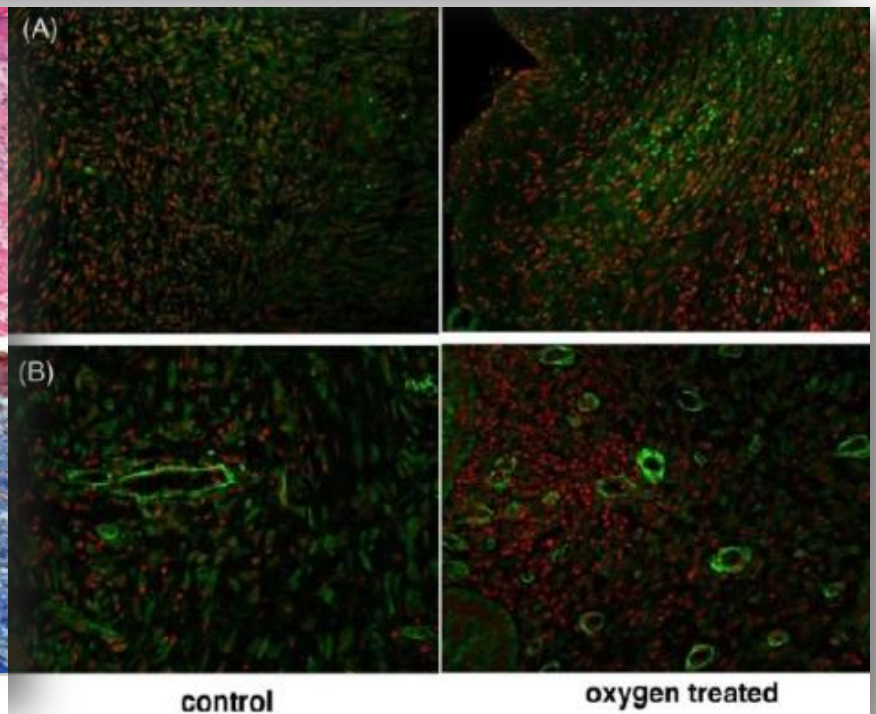
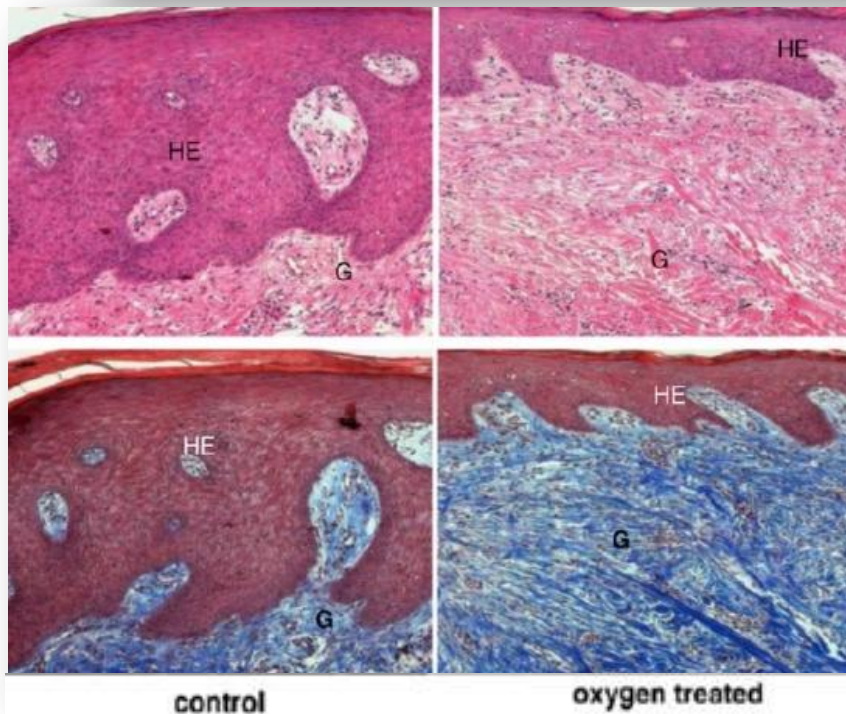
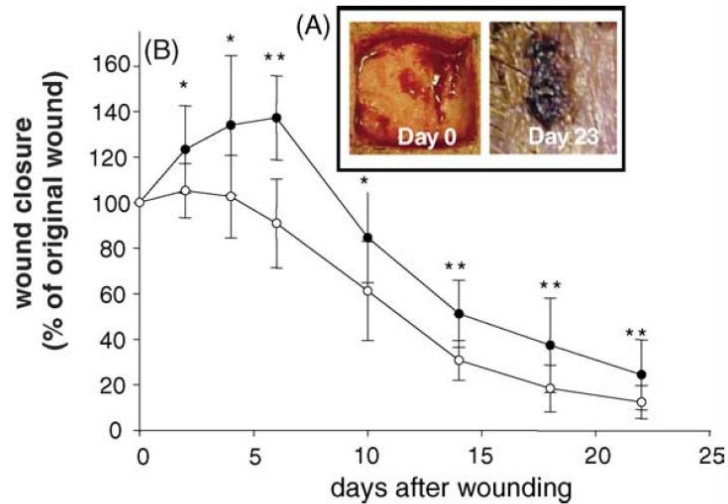
OxyLite™

In vivo and in vitro oxygen monitoring



- Hypoxic tissue culture
- Tissue engineering
- Hypoxia/ischemia in tissues







TOPICAL HYPERBARIC OXYGEN TREATMENT OF PRESSURE SORES AND SKIN ULCERS

BOGUSLAV H. FISCHER

Reprinted from THE LANCET, August 23, 1969, pp. 405-409

$n=52$

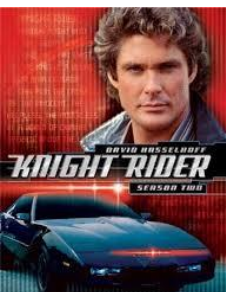


Reprinted from
The Journal of Dermatologic Surgery, Inc.
Vol. 1 No. 3 October 1975 Copyright © 1975

Treatment of Ulcers on the Legs With Hyperbaric Oxygen

BOGUSLAV H. FISCHER, M.D.

$n=30$

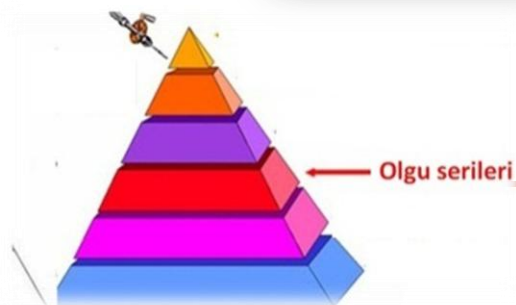


J Am Podiatry Assoc. 1982 Apr;72(4):180-5.

The effect of hyperbaric oxygen on lower extremity ulcerations.

Diamond E, Forst MB, Hyman SA, Rand SA.

$n=?$





JAMA Dermatology

Article | May 1984

A Simplified Hyperbaric Oxygen Technique for Leg Ulcers

Madalene C. Y. Heng, MBBS, FRACP, FACD; Jennifer P. Pilgrim, MBBS; Francis W. J. Beck, MS

n=20

J Dermatol Surg Oncol. 1993 Aug;19(8):784-93.

Topical hyperbaric therapy for problem skin wounds.

Heng MC.

n=?

Ostomy Wound Manage. 2000 Sep;46(9):18-28, 30-2.

Angiogenesis in necrotic ulcers treated with hyperbaric oxygen.

Heng MC¹, Harker J, Csathy G, Marshall C, Brazier J, Sumampong S, Paterno Gomez E.

n=40

Ostomy Wound Manage. 2000 Mar;46(3):52-60, 62.

Enhanced healing and cost-effectiveness of low-pressure oxygen therapy in healing necrotic wounds: a feasibility study of technology transfer.

Heng MC¹, Harker J, Bardakjian VB, Avvazian H.

n=15

← Olgu serileri





HENG MEDICAL INC.

CAMARILLO, CALIFORNIA

HOME

PHYSICIANS

CONTACT

SOCIAL



"DEDICATED TO IMPROVING
WELLNESS FROM THE INSIDE OUT"

CARDIOLOGY

Ming K. Heng, MD, FRACP, FAHA

Clinical Professor of Medicine, UCLA School of Medicine
Board Certified | Internal Medicine & Cardiovascular Disease

DERMATOLOGY

Madalene C.Y. Heng, MD, FRACP, FACP, FAAD

Clinical Professor of Medicine, UCLA School of Medicine
Board Certified | Dermatology





Topical oxygen as an adjunct to wound healing: a clinical case series

Loree K. Kalliainen, Gayle M. Gordillo, Richard Schlanger, Chandan K. Sen*

Department of Surgery, 512 Davis Heart & Lung Research Institute, The Ohio State University Medical Center, 473 West 12th Avenue, Columbus, OH 43210, USA

Received 29 October 2002; accepted 4 November 2002

n=32

Clin Exp Pharmacol Physiol. 2008 August ; 35(8): 957–964. doi:10.1111/j.1440-1681.2008.04934.x.

Topical Oxygen Therapy Induces VEGF Expression and Improves Closure of Clinically Presented Chronic Wounds

Gayle M Gordillo^{1,2}, Sashwati Roy^{1,2}, Savita Khanna^{1,2}, Richard Schlanger^{1,2}, Sorabh Khandelwal^{1,3}, Gary Phillips⁴, and Chandan K. Sen^{1,2}

n=25



Olgu serileri



Topical Treatment Ulcers:

Eric Blackman,
Railton, MD, FF

24

OSTOMY WOUND

Table 1. Baseline patient and wound characteristics

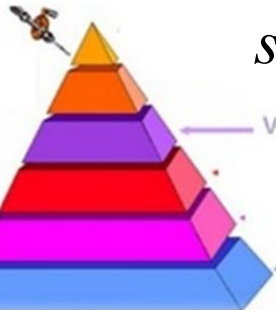
Characteristics	Control group N = 11	TWO ₂ group N = 17
Age (years)	63.4 (9.6)	62.4 (9.7)
Gender (male)	8 (72.7%)	12 (70.6%)
HbA1c (%)	7.4% (1.2%)	7.3 (1.2)
Current smoker	0 (0%)	2 (11.8%)
Ankle-brachial systolic pressure index (mm Hg)	1 (0.18)	0.9 (0.21)
Wound duration before therapy (months)	3.2 (0.4)	6.1 (5.8)
Wound area (cm ²)	1.4 (0.6) ^a	4.1 (4.3) ^a
Wound stage		
C II	0 (0%)	0 (0%)
C III	0 (0%)	1 (5.9%)
D II	7 (63.6%)	5 (29.4%)
D III	4 (36.4%)	11 (64.7%)

the
t
Study

, FRCS(C); Richard

WWW.O-WITI.COM

Sonuç: TO tedavisi alan ve iyileşme gösteren 17 hastanın 14'ü (%82.4) ortalama 56 günde iyileşirken, kontrol grubunda iyileşme gösteren 11 hastanın 5'inde (%45.5) bu süre 93 gün olarak bulunmuştur



Vaka / kontrol

Randomized Controlled Trial of Topical Hyperbaric Oxygen for Treatment of Diabetic Foot Ulcers

Camilo A. Leslie, MD
Francisco L. Sapico, MD, FACP
Virginia J. Ginunas, MT
Rodney H. Adkins, PhD

TABLE 1
Baseline clinical characteristics

	Group 1 (THO)	Group 2 (control)	Total
n	12	16	28
Age (yr)	52.8 ± 8.6	46.2 ± 8.5	49 ± 8.9
Male/female	6/6	10/6	16/12
IDDM/NIDDM	0/12	4/12	4/24
Diabetes duration (yr)	11.4 ± 7.6	13.2 ± 8	12.4 ± 7.8
Ulcer duration (wk)	6.4 ± 6.2	6.2 ± 7.8	6.3 ± 7
Previous amputations	7	5	12
Abnormal arterial Doppler study (ankle/brachial ratios <0.5 or >1.5)	1 of 10	2 of 14	3 of 24
Abnormal bone scan or X rays	6	5	11
White blood cell count >12,000/mm ³	0	2	2
Erythrocyte sedimentation rate (mm/h, Westergren method)	72 ± 31	66 ± 40	71 ± 36

THO, topical hyperbaric oxygen treatment; WBC, white blood cell.

Lalettavin Murakabeli Tettebbu



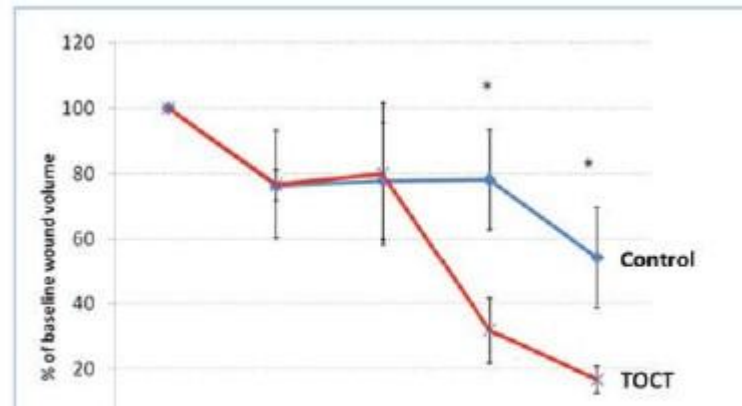
A Prospective, Randomized Clinical Study Evaluating the Effect of Transdermal Continuous Oxygen on Diabetic Foot Ulcers and Wounds

Vickie R. Driv
Guosheng Gu

Table 2. Baseline characteristics of patients

	Control (n=8)	TCOT (n=9)	P value
--	------------------	---------------	---------

Ulcer
Ulcer
Wagn
I
II



>0.05
>0.05
>0.05

ci, DDS, PhD;
D

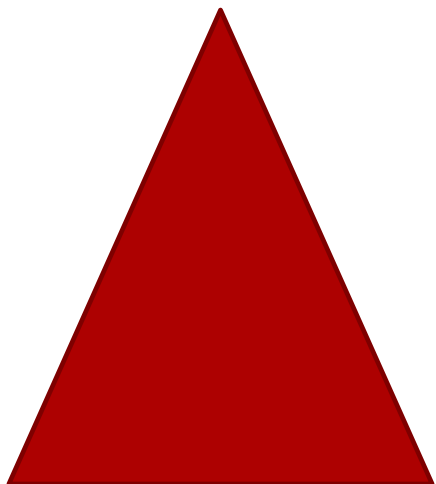
Limitations

An important limitation of this study is that treatment was limited to 4 weeks and wounds were not followed until healing, so time to healing is not known. In addition, as



• Sonuç

- TOT' un yara tedavisinde kullanımı halen tartışmalı bir konudur, çok sayıda geniş ve bilimsel kanıt düzeyi yüksek çalışmalara ihtiyaç vardır.
 - TOT'un kemiğe difüze olmadığı kabul edilmektedir, bu nedenle Wagner grade 3 ve üstü yaralarda etkili olmayacağı söylenebilir.
 - Ayrıca Wagner grade 1 ve 2 olarak sınıflandırılan yaraların büyük çoğunluğu ideal bir yara bakım stratejisi ile iyileşebilmektedir.
 - Bu şartlar altında, güvenilir ve tekrarlanabilir veriler elde edilinceye kadar TOT' un kronik yarada rutin kullanımı önerilemez.
-

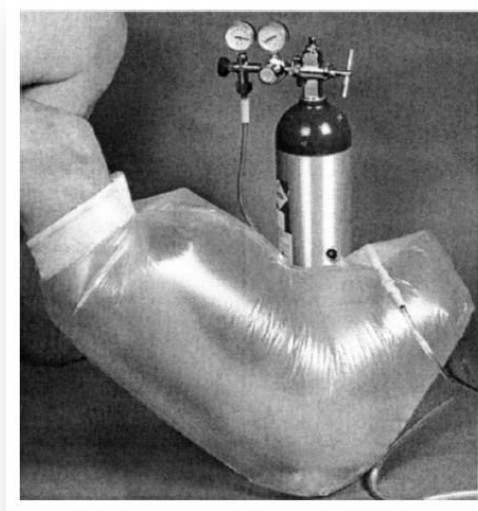


3



4







Teşekkürler
