

## Original Article

### Short Duration Hyperbaric Oxygen Therapy to Improve HbA1c, Leukocyte, and Serum Creatinine in Patient with Diabetic Foot Ulcer Wagner 3-4

#### Author:

**dr. Hendry Irawan**

Surgery Department, Faculty of Medicine, Udayana University, Sanglah General Hospital, Denpasar, Indonesia.

#### Co-Author 1:

**Dr. dr. I Nyoman Semadi, Sp.B, Sp.BTKV**

Thorax and Cardiovascular Surgery Division, Surgery Department, Faculty of Medicine, Udayana University, Sanglah General Hospital, Denpasar, Indonesia.

#### Co-Author 2:

**Prof. Dr. dr. I Gde Raka Widiana, Sp.PD-KGH**

Nephrology and Hypertension Division, Internal Medicine Department, Faculty of Medicine, Udayana University, Sanglah General Hospital, Denpasar, Indonesia.

#### Correspondence:

Name : dr. Hendry Irawan  
Phone : +62 82125097786  
Email : hendry\_irawan@rocketmail.com  
Affiliation : Surgery Department, Faculty of Medicine, Udayana University, Sanglah General Hospital, Denpasar, Indonesia.  
Address : Kesehatan Street No. 1, Denpasar, Bali, Indonesia.

Denpasar, 10-04-2018



Hendry Irawan

## Methods

This study uses pretest and posttest control group design, to know the role of standard therapy and combination therapy (standard therapy with adjuvant HBOT) to decrease HbA1c levels, leukocyte count, and serum creatinine levels in DFU patient Wagner 3-4. All DM patients with DFU at Sanglah General Hospital, Denpasar who meet the inclusion and exclusion criteria and willing to follow the research procedure. All patients are signing the agreement paper after getting research explanation. All patients were briefed on the study research using HBOT. If they are willing to participate in the study and use HBOT was grouped to combination therapy, if they are willing to participate in the study but do not want to use HBOT was grouped to standard therapy, but if they are not willing participate then excluded. The study was approved by Institutional Review Board of Medical Faculty of Udayana University and Sanglah General Hospital Denpasar with the ethical number 580/UN.14.2/KEP/2016.

Thirty diabetic patients with DFU Wagner 3-4 were participated in this study. All patients were taken blood test for HbA1c levels, leukocyte count, and serum creatinine levels before debridement, then grouped for standard therapy or standard therapy with 10 sessions of HBOT. One session of HBOT uses oxygen at 2.4 ATA for 90 minutes per day at multiplace hyperbaric chamber. This therapy is given five sessions in a week, so it takes two weeks. At the end of therapy, all blood tests were performed again in both groups.

The inclusion criteria were patients who had type 2 diabetes and DFU Wagner class 3 or 4, aged over 18 years, and underwent debridement with or without toe amputation. The exclusion criteria were patients who had severe organs dysfunction such as heart failure, pulmonary infection, pneumothorax, chronic obstructive pulmonary disease, and stroke.

Statistical analysis using SPSS 17.0 (SPSS Inc., Chicago, IL, USA). All variables were described before and after treatment. Analysis pretest and posttest values on both groups were used paired T-test and independent T-test. The statistical test results are significant if  $p < 0.05$ .