SIPS 2017

Proceedings of the
Surabaya International Physiology Seminar

Surabaya - Indonesia

October 12 - 14, 2017
BRIEF CONTENTS

INVITED SPEAKERS ........................................................................ IV
ORGANIZING COMMITTEES ................................................................. V
FOREWORD .................................................................................... VII
CONTENTS ..................................................................................... XI
INVITED SPEAKERS

Cheng Hwee Ming  
University of Malaya  
Malaysia

Daniel John Green  
University of Western Australia  
Australia

Fadzil Hamzah  
Sport Center of Changi General Hospital  
Singapore

Deanne Helena Skelly  
Griffith University  
Australia
ORGANIZING COMMITTEES

SCIENTIFIC COMMITTEE

Cheng Hwee Ming, Department of Physiology, Faculty of Medicine, University of Malaya, Malaysia
Daniel John Green, University of Western Australia, Australia
Fadzil Hamzah, Changi Sports Medicine Centre, Changi General Hospital, Singapore
Deanne Helena Skelly, University of Western Australia, Australia
R. Soedarso Djojonegoro, Universitas Airlangga, Indonesia
Paulus Liben, Universitas Airlangga, Indonesia
Elyana Asnar STP, Universitas Airlangga, Indonesia
Choesnan Effendi, Universitas Airlangga, Indonesia
Harlina, Universitas Airlangga, Indonesia
Tjitra Wardani, Universitas Airlangga, Indonesia
Gadis Meinar Sari, Universitas Airlangga, Indonesia
Purwo Sri Rejeki, Universitas Airlangga, Indonesia
Lilik Herawati, Universitas Airlangga, Indonesia
Bambang Purwanto, Universitas Airlangga, Indonesia
Kristanti Wanito Wigati, Universitas Airlangga, Indonesia
Hayuris Kinandita Setiawan, Universitas Airlangga, Indonesia
Irfiansyah Irwadi, Universitas Airlangga, Indonesia
Sundari Indah Wiyasihati, Universitas Airlangga, Indonesia
Eka Arum Cahyaning Putri, Universitas Airlangga, Indonesia
Misbakhul Munir, Universitas Airlangga, Indonesia
FOREWORD

Dean of Faculty of Medicine, Universitas Airlangga

Assalamu’alaikum Wr. Wb.

Distinguished Guests, all the Participants, Ladies and Gentlemen

On behalf of Faculty of Medicine, Universitas Airlangga, it is my great pleasure to welcome all the speakers, moderators, and participants on Surabaya International Physiology Seminar 2017 (SIPS 2017), which will be held from today, October 12th until October 14th, 2017. I would like to express my hearty welcome to all the international speakers, Prof. Cheng Hwee Ming, from University of Malaya, Malaysia; Prof. Daniel John Green, from University of Western Australia; Dr. Fadzil Hamzah, from Sport Center of Changi General Hospital, Singapore and Dr. Deanne Helena Skelly, from Griffith University, Australia.

The aim of SIPS 2017 is to provide a platform for academicians, educators, researchers, practitioners, undergraduate and postgraduate students to share and discuss the knowledge of the recent issues, opinions, researchers about the development and innovation of physiology in medical science, dentistry, veterinary, plants and agriculture, sports and sciences.

I believe this event is a great purpose in order to develop knowledge, experiences and best practices that can be applied for the good, especially in the field of healthcare as a whole.

Finally, I would like to express my sincere acknowledgements to those who take part and especially for Department of Medical Physiology, Faculty of Medicine, Universitas Airlangga for their effort in holding this event and wishing all to have success.

Wassalamu’alaikum Wr. Wb.

Prof. Dr. Soetojo, MD.
Faculty of Medicine, Universitas Airlangga
Greetings,

On behalf of SIPS committee and Physiology Department, Universitas Airlangga, we are welcoming to Surabaya, City of Heroes.

This year, the annual meeting of Indonesian Physiology Society (IAIFI) is hosted at Surabaya, entitled “Surabaya International Physiology Seminar Workshop (SIPS)”. We present some update workshop and lectures in order to bring physiology research from basic to clinical application on humanities, animal welfare and good environment. All participants have opportunities to publish their research in presentation, poster and ISBN proceeding. Selected papers will be submitted to SCOPUS indexed proceeding/journal and awarded as Best Poster and Best Oral Presentation.

We hope that all participants will get some interesting experiences for next 3 days, 12-14 October 2017. Enjoy our lectures and workshops, taste the culinary and take your time to sightseeing around Surabaya.

Wassalamu ‘alaikum wr. wb.

Dr. Bambang Purwanto
Chairman of Committee / Head of Physiology Department
Faculty of Medicine, Universitas Airlangga
Welcome Address - Surabaya International Physiology Seminar Workshop (SIPS)

Dear fellow Physiologists and Participants,

On Behalf of the Indonesian Physiological Society (IAIFI) and the Physiology Department Faculty of Medicine Universitas Airlangga, I would like to welcome you all to Surabaya International Physiology Seminar (SIPS), held on 12-14 of October 2017.

Finally after long-awaited Surabaya gets a turn again to host and organize the International Physiology Seminar. Hence the Steering- and Organizing Committee consisting of young energetic physiologists are determined to make the Seminar a successful one. The theme of the seminar is:

"The Role of Physiology in Translation Research: From Basic to Application"

This annual meeting covers a wide range of topics of Physiology on Medicine, Dentistry, Veterinary, Plants and Agriculture, Sports and Sciences. We sincerely hope that SIPS 2017 enable to provide a platform for academicians, educators, researchers, practitioners and postgraduate students to present and discuss researches, development and innovations in wide range of topics as mentioned above. It will provide all participants to share knowledge, exchange new ideas and their experiences in many research topics, for then it will enhance future collaborations.

With great interest and enthusiasm I look towards the success of this Seminar, and wish all of you every success and a pleasant stay in Surabaya.

May Allah Swt. bestow upon us His Blessings.

On Behalf of the Steering and Organizing Committee Senior Physiologist,

Prof. R. Soedarso Djojonegoro
CONTENTS

PAPERS

FULL PAPERS

The Dominant Personality Type in Vertigo Patients
Nanda Ricky FS, Netty Herawati, Nyilo Purnami, Nining Febriyana and Abdurachman
5

The Role of Osteocytes in Alveolar Bone During Tooth Movement
Agni Febrina Pargaputri and Noengki Prameswari
10

Body Movement and Islamic Energy Psychology Acupressure to Improve the Future Orientation In A Person With HIV
Ambar Sulianti and Fenti Hikmawati
15

White Matter Changes in Neurodegenerative and Global Cortical Atrophy Scale Correlation in Older Patients Using Magnetic Resonance Imaging
Anggraini Dwi Sensusiati
21

The Influence of Mass Basic Life Support Training on The Skills and Attitude in Undertaking Life Support Using the Method of the Faculty of Medicine, Universitas Airlangga
Arie Utariani, Teguh Sylvaranto, April Poerwanto Basoeki, Prananda Surya Airlangga, Windy Ari Wijaya, Soni Sunarso Sulistiawan, Bambang Pujo Semedi, Christrijogo Sumartono, Hamzah, Kohar Hari Santoso, Philia Setiawan and Eddy Rahardjo
26

Reflections of a Physiology Teacher
Cheng Hwee Ming
30

Does Sequential Diabetes Dance Improve on Glucose Level and Glucose Tolerance?
Cynthia Wahyu Asrizal and Bambang Purwanto
33

Antioxidant Effect of Dayak Onion Extract (Eleutherine Americana Merr.) on Serum MDA Levels in Mice (Mus Musculus) Exposed by Lead Acetate
Daeng Agus Vieya Putri, Gadis Meinar Sari and Tjitra Wardani
37

Exercise as Cardiovascular Medicine: Early Detection and Optimal Prevention
Danny Green and Raden Ar'garini
40

The Effect of Circadian Rhythm on Hematopoietic Stem Cell Mobilization in Peripheral Blood as a Result of Submaximal Physical Exercise
Dhoni Akbar Ghozali, Harjanto and Agung Dwi Wahyu Widodo
48

The Effect of Intermitten Fasting Vs Low Calorie Diet to Insuline Like Growth Factor-1 (IGF-1) Concentration, Fat Mass and Lean Mass of Rattus Norvegicus Obesity Model
Dian Wijayanti, Sunarjati Sudigdo Adi, Achadiyani, Gaga Irawan Nugraha, Reni Farenia and Adi Santosa Maliki
53

Uphill 10° Inclination Angle of Treadmill Concentric Exercises Improves Blood Glucose Levels and Glut-4 Levels in Diabetes Mice Model
Dini Surya Noviyanti, Bambang Purwanto and Choesnan Effendi
56
Variability in The Response to Low Impact Aerobic Exercise in Women Abdominal Obese With the Polymorphism of Uncoupling Protein-1 Gene
D Mukhtar, Siagian M, N Ibrahim, Neng Tine, T Ahmad, M Suryaatmadja, SW Jusman, AS Sofro, M Abdullah, S Waspudji and S Sugondo

The Effect of an Aluminium Foil Shield on Reducing The Strength of Electromagnetic Radiation of Mobile Phones Reaching the Oculi of Adult Male Rats
Dion K. Dharmawan, Viskasari P. Kalanjati and Abdurachman

The Effect of Osteocyte Signalling on Osteocyte Apoptosis
Dwi Setiani Sumardiko, Purwo Sri Rejeki and Gadis Meinar Sari

Intermittent Physical Training Decreases Peak of Blood Glucose Level after Meals in Rats
Eka Arum Cahyaning Putri, Raden Argarini, Bambang Purwanto and Lilik Herawati

The Effect of Cantaloupe Extract on Sperm Quality of Adult White Rats (Rattus Novergicus) Strain Induced by Ciproteron Acetat
Elyna Mahruzza Putri, Achadiyani, Sunarjati, Sudigdoadi, Oki Suwarsa and Adi Santosa Maliki

Correlation Between Academic Stress, Sleep Quality, Circadian Misalignment, Cortisol Concentration and Heart Rate Value at the First Year Medical Student at the State Islamic University Maulana Malik Ibrahim of Malang
Ermin Rachmawati, Muhammad Farid Wafi and Ira Resmi Melani

PlGF as Predictor of Preeclampsia Complication
Ernawati E, Manggala PS, Khanisyah Erza, Rozi Aditya, Cininta M, Ml Aldika Akbar, Budi Wicaksono, Agus Sulistyono, Hermanto TJ, Nadir Abdolah, Erry Gumilar and Adityawarman A

Aluminum Foil Shield Diminishes the Electromagnetic Radiation of Mobile Phones in the Cerebellum of Adult Male Rats
Etha Rambung, Viskasari P. Kalanjati and Abdurachman

Sauropus Androgynus for Increasing Uterine Weight in Menopausal Women: An Experimental Study Using Animal Models
Exma Mu'tatal Hikmah and Retno Susilowati

Exercise And Swimming in Pregnancy - Physiological Considerations
Fadzil Hamzah

The Comparison Effect Between Bodyweight and Sprint Interval Exercises Using Tabata Method Towards Heart Rate Frequency, Lactate Blood and Physical Fatigue Perception
Fengki Aditiansyah, Elyana Asnar and Choesnan Effendi

Detection of COMT Val158Met Gene Polymorphism in Chronic Schizophrenic Patients at Psychiatric Unit of DR. Soetomo Hospital Surabaya, East Java, Indonesia
Gwenny Ichsan Prabowo, Margarita Maria Maramis, Erikavitri Yulianti, Afrina Zulaikah, Zain Budi Syulthoni, Citrawati Dyah Kencono Wungu, Hendy Muagiri Margono and Retno Handajani

Hyperbaric Oxygen (HBO) Heals Cell Through Reactive Oxygen Species (ROS)
Handi Suyono and Guritno Suryokusumo

Correlation of Fat Free Mass and Skeletal Muscle Mass with Left Ventricular Mass in Indonesian Elite Wrestlers and Dragon Boat Rowers
Henny Tantono, Mohammad Riski Akbar, Badai B. Tiknadi, Triwedya Indra Dewi, Sylvie Sakasasmirta, Maryam Jamilah, Daniel Womsiwor, Ambrosius Purba, Augustine Purnomowati and Toni Mustahsani Aprami
Decrease of Homocysteine Plasma Degree in Smokers by Low Intensity Weight Training and Supplementation of Folic Acid and Cyanocobalamin

HS Muhammad Nurfatony, Damayanti Tinduh and Tjitra Wardhani

The Role of Physiology in Ergonomics - Empowerment Human Resources for Nations Competitiveness

I Putu Gede Adiatmika

Influence of Use of Insole on Blood Glucose Rate Diabetes Mellitus Type-2

Ignatius Heri Dwianto, Bambang Purwanto and Sony Wibisono

The Profile of Endothelin-1 (Et-1), Receptor ET$_A$, And Receptor ET$_B$ in Young and Adult Obese Wistar Rat

Irfan Idris, Aryadi Arsyad, A. Wardihan Sinrang and Syarifuddin Alwi

Characteristics of Glucose Tolerance, Energy Expenditure, Lactic Acid Level, and Oxygen Saturation in Indonesian Diabetes Dance Version 6

Irfiansyah Irwadi and Bambang Purwanto

The Effect of Aluminium Foil Shielding in Hampering Electromagnetic Radiation Emitted from A Mobile Phone as an Oxidative Stressor in The Cerebra of Adult Male Rats

Irmawan Farindra, Viskasari P. Kalanjati and Ni Wajan Tirthaningsih

Effect of Exercise on Learning Capability and Memory of Mice (Mus Musculus) Exposed to Monosodium Glutamate (MSG)

Husnur Rofiqoh, Kristanti Wanito Wigati and Suhartati

Low, Moderate, and High Intensity Swimming Exercise Has No Negative Effect on Semen Analysis Test in Male Wistar Rats

Kristanti Wanito Wigati, Sundari Indah Wiyasihati and Misbakul Munir

High-Calorie Diet Reduces Neurogia Count

Nilam Anggraeni, Kristanti Wanito Wigati, I Lukitra Wardani and Lilik Herawati

Three Weeks of High-Intensity Interval Training (HIIT) Decreases Visfatin Level on Overweight Men

Amal A. Hidayat, Mohammad Budiarto and Lilik Herawati

VO2MAX of Ergocycle Astrand Test Differs from 12-Minutes Cooper Running Test on Medical Students’ Physical Fitness Level

Bella Anggi Afisha, Atika and Lilik Herawati

Non-Invasive Method on Slow-Twitch Quadriceps Muscle Fibers Dominate a High Level of Fitness

Yuannita Ika Putri, Andre Triadi Desnantyo and Lilik Herawati

Genotype Hepatitis B Virus Among Intravenous Drug Users with Occult Hepatitis B Infection in Surabaya, Indonesia

Lina Lukitasari, Lilik Herawati, Edhi Rianto, Indri Safitri, Retno Handajani and Soetjpto

Anopheles Vagus Larval Midgut Damage as an Effect of Areca Catechu L. Seed Extract

Majematang Mading, Yeni Puji Lestari, Etik Ainun Rohmah, Budi Utomo, Heny Arwati and Subagyo Yotopranoto

The Effect of Mozart’s Music on Mus Musculus Balb/C Spermatozoa’s Quantity and Motility Exposed by Lead Acetate

Maria Selviana Joni, Paulus Liben and Hermanto Tri Joewono
The Lactid Acid’s Decrease After Submaximal Exercise Due to Zamzam Water Treatment Compared the Packed Water
Moh. Tomy Yusep, Elyana Asnar STP and Harlina

The Correlation of Lung Vital Capacity, VO$_2$Max, and Heart Rate Recovery With Changes in Blood Lactate Levels in Young Male: Cross Sectional Study in Provoked By Repeated Sprint Sessional-3
Mustofa, Susiana Candrawati, Khusnul Muflikhat, Tiara Dwivantari, Rahardita Alidris and Desy Dwi Zahrina

Fgf 21 Secretion as Acute Response to Exercise in High Fat Diet Fed Rats
Nafi’ah, Imelda Rosalyn Sianipar, Nurul Paramita, Rabia and Neng Tine Kartinah

The Miracle of Stichopus Hermanii
Noengki Prameswari

Effect of Chemical Exposure on Endocrine System Disorder (Article Review)
Nurul Mahmudati and Husamah

The Effect of Acute Exercise of Basic Breathing Motion on Breathing Skills Retention in Swimming
Osky Sinta Dewanti and Choesman Effendi

Correlation Between Body Mass Index and Medial Longitudinal Arch of The Foot in Children Aged 5–6 Years
Purwo Sri Rejeki, Irfiansyah Irwadi, Widiarti and Misbakhul Munir

Correlation Between Agility and Flat Feet in Children 5–6 Years Old
Anita Faradilla Rahim, Miftahul Nur Amaliyah, Irfiansyah Irwadi and Purwo Sri Rejeki

Correlation Between Hand Grip and Achievement in Indonesian Female Floorball Athletes
Loren Fibrilia Perangin-angin, Siti Maesaroh, Irfiansyah Irwadi and Purwo Sri Rejeki

Maternal Anthropometrics as a Predictor of Preeclampsia Risk Factor
Putri Wulan Akbar, Florentina Sustini, Hermanto Tri Juwono and Handayani

Correlation Between Activity Level and Circadian Rhythmicity of Medical Students (Class Of 2014) at the Faculty of Medicine, Airlangga University
Qurrota Ayuni Novia Putri, Irfiansyah Irwadi, Agustina Salinding and Sundari Indah Wiyasihati

Exercise Formula to Induce Beiging Process: A Study Based on Acute Response of Irisin
Rabia, Neng Tine Kartinah, Nurul Paramita, Nafi’ah and Imelda Rosalyn Sianipar

Effects of the 6th Series of Senam Diabetes Indonesia on Energy Expenditure
Riza Pahlawi, Harjanto JM and Dwikora Novembri Utomo

The Difference of B-Endorfin Level in Brain Tissue and Testicular Tissue on Wistar Rats Given Once a Week Aerobic and Anaerobic Exercise
Rostika Flora, Lisna Ferta Sari, Muhammad Zulkarnain and Sukirno

The Effectiveness of Ultrasound-Guided Injection for Pain Management in Indonesia
Soni Sunarso Sulistiani, Dedi Susila, Belindo Wirabuana, Herdiani Sulistyo Putri, Yusufa Fil Ardy, Ferdian Rizaliansyah, Noryanto Ikromi, Bambung Pajo Semedi, Arie Utariani, Hamzah and Nancy Margarita Rehatta

Effects of Moderate Intensity Aerobic Exercise on MMP-9 Level, NOx Plasma Level and Resting Blood Pressure in Sedentary Elderly Women With Overweight
Suhartini SM, Gusbakti R and Ilyas ElI
Correlation Between Oxidative Stress Level with Plasma Beta Endorphin Level of Male Laboratory Rats Given Aerobic and Anaerobic Exercise
Sukirno, Herlia Elvita, Mohammad Zulkarnain and Rostika Flora

Bone Age Estimates the Onset of the Adolescent Growth Spurt Among Male Basketball Players
Sundari Indah Wiyasihati, Bambang Purwanto and Agus Hariyanto

The Correlation Between Haemoglobine and Body Mass Index With The Changes of Blood Lactate Levels in University of Jenderal Soedirman’s Medical Students - A Study at Repeated Sprint Sessional 3
Susiana Candrawati, Wiviek Fatchurohmah, Ahmad Agus Faisal and Hana Khairunnisa

Laughter Therapy Lowers Blood Pressure and Heart Rate in Hypertensive Balinese Patients at Ambarashram Ubud Bali
Suyasning HI and Adi Pratama Putra P

The Different Effects of Contrast Water Immersion and Warm Water Immersion on Blood Lactic Acid Levels After Submaximal Physical Activity Among Basketball Athletes
Taufan Reza Putra, Elyana Asnar STP and Dwikora Novembri

Diabetes Sprague-Dawley Model Induced With Fat Diet And Streptozotocin
Thressia Hendrawan, Nurul Paramita, Dewi Irawati and Ani Retno Prijanti

The Difference of Heart Rate and Blood Pressure in Aerobic and Anaerobic Predominant Athlete Koni West Java Year 2016
Titing Nurhayati, Hafiz Aziz and Nova Sylviana

Effect of Exhaustive Exercise on Blood Lymphocyte Count and Diameter of Splenic White Pulp in Rats
Tri Hartini Yuliawati, Dewi Ratna Sari, Rimbu, Atika, Iskantijah and Ari Gunawan

The Use of Purple Sweet Potato (Ipomoea Batatas L.) to Decrease Levels of Mda and Recover Muscle Damage
Utami Sasmita Lestari, Elyana Asnar and Suhartati Soewono

Risk Factors of Low Back Pain Among Tailors in Kramat Jati, East Jakarta
Vivi Anisa Patri, Leli Hesti and Nurfitri Bustamam

The Correlation of Norovirus Infection to Severity Degree of Acute Diarrhea in Children Under Five Years Old in Mataram City, Lombok
Warda Elmaita, Juniastuti and Soetjipto

Malaria Prevalence in Alor District, East Nusa Tenggara, Indonesia
Yeni Puji Lestari, Majematang Mading, Fitriah, Avia Putriati Martha, Didik Muhammad Muhdi, Juniarsih, Zainal Ilyas Nampra, Sukmawati Basuki and Florentina Sustini

The Potential Role of 25-Hydroxycholecalciferol on Calcium Regulation in Young Sedentary Women With Goat’s Milk Intervention
Yusni

Hemoglobin A1C as the Strongest Influencing Factor in relation to Vascular Stiffness in Type 2 Diabetes Mellitus - Metabolic Syndrome Patients
Deasy Ardianti, Soebagijo Adi, Ari Sutjahjo and Askandar Tjokroprawiro

Thyroid Crisis and Hyperosmolar Hyperglycemic State in a Hyperthyroid Patient
Yudith Annisa Ayu Reskitha, Rio Wironegoro, Hermawan Susanto, Soebagijo Adi and Ari Sutjahjo
Effect of Growth Hormone Deficiency on the Cardiovascular System  
Irma Magfirah, Soebagijo Adi Soelistijo, Hermina Novida and Deasy Ardiany  
342

Metformin, Effects Beyond Glycemic Control  
Soebagijo Adi Soelistijo and Askandar Tjokroprawiro  
349

The Correlation of Initial CD4 Cell Count with Increased Alanine Aminotransferase in Patients with Human Immunodeficiency Virus Who Have Received Nevirapine  
Abdur Rokhim, Usman Hadi and Erwin Astha Triyono  
356

Profile of Bacteraemia and Fungemia in HIV/AIDS Patients with Sepsis  
Sajuni Widjaja, Erwin Astha Triyono and Arthur Pohan Kawilarang  
363

The Association between Cryptococcal Antigenemia and CD4+ T lymphocyte Count in HIV/AIDS Patients with Suspected Cryptococcus Infection  
Sajuni Widjaja, Erwin Astha Triyono and Arthur Pohan Kawilarang  
370

Impact of Music on Sport Intensity (Allegro) and on Levels of Left Ventricular Myocardial Damage in Wistar Rats  
Faris Pamungkas Wicaksono, Sugiharto, Rias Gesang Kinanti, Paulus Liben, Suhartono Taat Putra and Purwo Sri Rejeki  
378

Association of Topical Capsaicin Exposure Dosage and Its Influence on Macrophages and Neutrophils in Periodontal Tissue  
Ratna Mustriana, Haryono Utomo and Purwo Sri Rejeki  
383

Pharmacological Therapy of Portal Hypertension  
Mukhammad Burhanudin, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfa Kholili, Budi Widodo, Muhammad Miftahussurur, Husin Thamrin and Amie Vidyani  
389

Chronic Constipation Management in Adults  
Erliza Fatmawati, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfa Kholili, Budi Widodo, Husin Thamrin, Amie Vidyani and Muhammad Miftahussurur  
397

Diagnosis and Management of Ulcerative Colitis  
Rendy Revandana Bramantya, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfa Kholili, Budi Widodo, Amie Vidyani, Muhammad Miftahussurur and Husin Thamrin  
405

The Diagnosis and Management of Achlorhydria  
Dicky Febrianto, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfa Kholili, Budi Widodo, Amie Vidyani, Muhammad Miftahussurur and Husin Thamrin  
413

Acute Liver Failure  
Troy Fonda, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfa Kholili, Budi Widodo, Husin Thamrin, Amie Vidyani and Muhammad Miftahussurur  
421

Transient Elastography as Non-Invasive Examination of Hepatic Fibrosis  
Satyadi, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfa Kholili, Budi Widodo, Amie Vidyani, Muhammad Miftahussurur and Husin Thamrin  
426
Termination of Antiviral Administration in Chronic Hepatitis B
Edward Muliawan Putera, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfah Kholili, Budi Widodo, Husin Thamrin, Amie Vidyani and Muhammad Miftahussurur

Management for a Patient with Barret’s Esophagus: A Case Report
Muhammad Miftahussurur, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfah Kholili, Budi Widodo, Husin Thamrin and Amie Vidyani

Thrombocytopenia in Chronic Hepatitis C
Arvi Dian Prasetya Nurwidda, Poernomo Boedi Setiawan, Iswan Abbas Nusi, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfah Kholili, Budi Widodo, Amie Vidyani, Muhammad Miftahussurur and Husin Thamrin

Short Bowel Syndrome: Review of Treatment Options
Nina Oktavia Marfu’ah, Herry Purbayu, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Titong Sugihartono, Ummi Maimunah, Ulfah Kholili, Budi Widodo, Muhammad Miftahussurur, Husin Thamrin and Amie Vidyani

Problematic Diagnosis of a Patient with Tuberculosis Peritonitis
Elieza L. Pramugaria, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfah Kholili, Budi Widodo, Husin Thamrin, Amie Vidyani and Muhammad Miftahussurur

Pathophysiology of Irritable Bowel Syndrome
Rastita Widyasari, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Ulfah Kholili, Budi Widodo, Husin Thamrin, Amie Vidyani and Muhammad Miftahussurur

Recent Pathophysiology and Therapy for Paralytic Ileus
I Putu Surya Pradanta, Ulfah Kholili, Iswan Abbas Nusi, Poernomo Boedi Setiawan, Herry Purbayu, Titong Sugihartono, Ummi Maimunah, Budi Widodo, Amie Vidyani, Muhammad Miftahussurur and Husin Thamrin

A Case Report of a Patient with a Rare and Aggressive Plasma Cell Leukemia
Ugrosoeno Yudho Bintoro, Putu Niken Amrita, Raharjo Budiono, Made Putra Sadana and Ami Ashariati

Decreased Triglyceride and Protein Levels in Diabetic Rat Muscle Following Physical Exercise
Susiki Anggawati, Bambang Purwanto and Sutji Kuswarini

Abnormal Uterine Bleeding with Three Different Doses and Intervals of Hormonal Contraceptive Injection
Ananda Febina Kimresti A, Ashon Sa’adi, Lilik Djuari and Maftuhah Rochmanti

Hypertrophic Scars Cause Burn Injuries Assessed by the Vancouver Scar Scale
Ardea Ramadhanti Perdanakusumah, Iswinarso Dososaputro and Diah Mira Indramaya

Description of Body Mass Index Changes in Emergency Patients at the Intensive Observation Room–Emergency Installation
Galang Damariski Lusandi, Prananda Surya Airlangga and Ariandi Setiawan

Laboratory Profile of Acute Diarrhea and Chronic Diarrhea in Children
Mochammad Nasrulloh, Alpha Fardah Athiiyyah and Arifoel Hajat

XVII
Effect of Ethanol Extract of Ruellia tuberosa L. Leaves on Total Cholesterol Levels in Hypercholesterolemia Model of Mus Musculus L
Nurin Kasuma Dewi, Siti Khaerunnisa and Danti Nur Indriastuti

Combination of Aerobic and Resistance Exercise in Lowering Blood Glucose Levels Compared to Aerobic or Resistance Exercises in a Male Wistar Rat Model with Diabetes Mellitus
Sahrul Latif, Dwikora Novembri Utomo and Purwo Sri Rejeki

AUTHOR INDEX
Characteristics of Glucose Tolerance, Energy Expenditure, Lactic Acid Level, and Oxygen Saturation in Indonesian Diabetes Dance Version 6

Irfiansyah Irwadi and Bambang Purwanto

Department of Physiology, Faculty of Medicine, Universitas Airlangga, Jl. Mayjen. Prof. Dr. Moestopo No. 47 Surabaya, Indonesia
irfiansyah@fk.unair.ac.id

Keywords: Diabetes Dance, Energy Expenditure, Glucose Tolerance, Lactate, Oxygen Saturation.

Abstract: Objective: One approach of the Indonesian Diabetes Association (PERSADIA) to prevent glucose intolerance, which is the first sign of the course of diabetes mellitus progression, is through increased programmed and measurable physical activity, such as dance. This study aims to determine the effect of diabetes dance version 6 on oxygen saturation, energy expenditure, lactic acid levels and glucose tolerance. Methodology: A total of 32 subjects were measured for fasting and 2 hours post prandial (2hPP) blood glucose, then they performed a diabetes dance version 6 and we measured heart rate, oxygen saturation, energy expenditure and lactic acid blood levels. A day later, at the same time, we measured the same parameters. Output: There was no difference in glucose tolerance, both before (33.91±24.14) and after (34.37±22.31) the diabetes dance version 6 (p: 0.918). Total energy expenditure still did not reach the recommended value: 83.77±22.96 (>135 kcal). Diabetes dance version 6 is accordance with American Diabetes Association (ADA) recommendations in terms of percentage of heart rate maksimum 67.12±8.46 (standard: 50-70%), lactic acid 1.79±0.82 (standard: <4mmol/L and SpO2 97.94±0.72) Conclusion: diabetes dance version 6 did not produce a significant difference in glucose tolerance, and did not achieve the recommended energy expenditure, but this version of the exercise of diabetes dance did match the training zone requirement.

1 INTRODUCTION

Diabetes mellitus (DM) is a syndrome characterized by elevated blood glucose levels (hyperglycemia) above the normal average. Increased blood glucose levels are caused by the failure of cells to transport glucose from the blood into the cells. Disturbance of glucose transport is caused by low insulin stimulation and/or low response to insulin stimulation. Both glucose transport impairments were observed through fasting blood glucose loading tests. Increased blood glucose levels after the loading of glucose per oral is called glucose intolerance (WHO, 1999; ADA, 2004).

Glucose intolerance is an early sign of DM progression. Pancreatic beta cells are unable to release adequate insulin, or tissue cells are unable to respond to insulin stimulation properly. Intolerance develops into sedentary hyperglycemia that triggers further DM complications. Prevention of glucose intolerance is an important first step in the control of DM disease (Sato, 2000; IDF, 2006).

Nutritional needs, especially glucose as the main ingredient of energy metabolism, can not be ignored in the daily diet. Daily glucose intake, in the form of polysaccharide, disaccharides, and monosaccharides, becomes the main menu. High glucose intake burdens pancreatic beta cells to synthesize insulin. Glucose restriction as an effort to prevent glucose intolerance often fails (Sato, 2000).

The Indonesian Diabetes Association (PERSADIA) recognizes the difficulty of preventing glucose intolerance through the restriction of glucose in the diet. Prevention of glucose intolerance is further developed through increased programmed and measurable physical activity, such as gymnastics/dance (Fox, 1998; Brown et al., 2009; Yendi, 2014). PERSADIA has developed a series of Diabetes dance, from series 1 to series 6. This study aims to determine the effect of diabetes dance
version 6 on oxygen saturation, energy expenditure, lactic acid levels and glucose tolerance.

## 2 METHODS

This study was a field experiment study. The population of this study was educational staff of Medical Faculty of Universitas Airlangga which has characteristics according to the criteria of women aged 21-60 years and with a random blood glucose concentration of 120-200 mg/dL. The subjects of the study underwent a health examination, were given information for consent and signed informed consent forms for approval following research procedures. Selected candidates who met the exclusion criteria and/or were unwilling to sign informed consent forms are excluded from the sample and replaced by another candidate. Subjects were asked to fast for 8 hours, and then their fasting blood glucose levels were taken. Subsequently subjects received carbohydrate for consumption, then 2 hours post prandial (2hPP) blood glucose levels were measured. Research subjects were then guided to do the movement of diabetes dance version 6 for 30 minutes with a tool installed to measure energy expenditure, that is, an Actiheart monitor. During diabetes dance, we measured heart rate, and oxygen saturation. And after diabetes dance, we determined the lactic acid level in the blood. A day later, at the same time, we measured the same parameters.

## 3 RESULTS

The research results show, that there were 35 research subjects that were able to follow the whole process, and we obtained the basic data characteristics as shown in Table 1.

### Table 1: Distribution of the participants.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>32.40</td>
<td>10.310</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>61.23</td>
<td>12.074</td>
</tr>
<tr>
<td>Body height (cm)</td>
<td>153.86</td>
<td>4.380</td>
</tr>
<tr>
<td>Body mass index</td>
<td>25.49</td>
<td>4.937</td>
</tr>
</tbody>
</table>

We measured the fasting blood glucose and 2 hours PP blood glucose before and after the diabetes dance version 6, and the results can be seen in Table 2.

### Table 2: Fasting blood glucose and 2 hours PP blood glucose.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Normal Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Blood Glucose Pre exercise (mg/dL)</td>
<td>83.829</td>
<td>11.2184</td>
<td>.200</td>
</tr>
<tr>
<td>2 hoursPP Pre exercise (mg/dL)</td>
<td>117.743</td>
<td>24.2443</td>
<td>.200</td>
</tr>
<tr>
<td>Fasting Blood Glucose Post exercise (mg/dL)</td>
<td>79.486</td>
<td>11.3484</td>
<td>0.126</td>
</tr>
<tr>
<td>2hPP Blood Glucose Post exercise (mg/dL)</td>
<td>113.857</td>
<td>20.9005</td>
<td>0.179</td>
</tr>
</tbody>
</table>

### Table 3: Glucose tolerance comparison.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Normal Distribution</th>
<th>Wilcoxon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose tolerance Pre exercise (mg/dL)</td>
<td>33.9143</td>
<td>24.13975</td>
<td>0.14</td>
<td>0.918</td>
</tr>
<tr>
<td>Glucose tolerance Post exercise (mg/dL)</td>
<td>34.3714</td>
<td>22.31734</td>
<td>0.12</td>
<td></td>
</tr>
</tbody>
</table>

From Table 3, blood glucose levels were increased after glucose loading (glucose tolerance) both for on pre and post-diabetes dance version 6. That is 33.91±24.13 before diabetes dance version 6, and 34.37±22.31 on one day after diabetes dance version 6. Based on statistics analysis, there was no significant difference in glucose tolerance between before and after the treatment of diabetes dance version 6.

### Table 4: Percentage of HR Max (%HRmax), lactic acid levels, total energy expenditure, and oxygen saturation.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>%HRmax (%)</td>
<td>67.1254</td>
<td>8.45762</td>
<td>50-70</td>
</tr>
<tr>
<td>Lactic acid levels (mmol/L)</td>
<td>1.7857</td>
<td>0.82217</td>
<td>&lt;4</td>
</tr>
<tr>
<td>Total energy expenditure (Kcal)</td>
<td>83.7714</td>
<td>22.96684</td>
<td>&gt;135</td>
</tr>
<tr>
<td>SPO2 (%)</td>
<td>97.94</td>
<td>.725</td>
<td>95-100</td>
</tr>
</tbody>
</table>

Other parameters measured in this study were Percentage of Heart Rate maximum (%HRmax), lactic acid levels, total energy expenditure, and oxygen saturation. This was done to see if the diabetes dance version 6 performed is in accordance with the recommendations issued by the ADA. In
Table 4 it can be seen that the diabetes dance version 6 was in accordance with the ADA recommendation in terms of %HRmax is 67.12 ± 8.46 (standard: 50-70%), lactic acid 1.79 ± 0.82 (standard: <4mmol/L) and SpO2 97.94 ± 0.72 From the data it can be seen that diabetes dance version 6 is done in the aerobic zone, but in the total energy expenditure results it still has not reached the recommended value of > 135 kcal.

4 DISCUSSION

Diabetes dance is a sequence of physical activities that was developed to prevent diabetes. Subjects with a high risk of diabetes were recommended to perform diabetes dance. Impaired fasting glucose and obesity were two diabetes risks commonly found among Indonesian subjects. Mean of fasting blood glucose level of subjects was 83.83mg/dl, higher than the ADA recommendation (≤ 70 mg/ dl). Mean of body mass index of subjects was 25.49kg/m², higher than the ADA recommendation (20 -24 kg/m²) (WHO, 1999; ADA, 2004; Chambers et al., 2009)

There were six versions developed of diabetes dance. This research evaluated the latest version compared with the ADA physical activity recommendation for diabetes prevention. Diabetes dance version 6 fulfilled the ADA recommendation for the exercise intensity (67.25% HRmax) and lactate level (1.78 mmol/L). Unfortunately, the total energy expenditure was only 83.77 kcal, significantly below the ADA recommendation. (WHO, 1999; ADA, 2004; Seo et al., 2009).

A low level of energy expenditure was found almost all subjects after a single bout of diabetes dance. Consistent with this, the fasting blood glucose levels were also not significantly lower (p= 0.92), even though the mean level of fasting blood glucose was lower after single bout diabetes dance version 6 performance. Higher energy expenditure might result in a lower fasting blood glucose level after performing diabetes dance. Repeated bouts of diabetes dance would increase total energy expenditure to the ADA recommendation. (ADA, 2004; Heled et al., 2005; Seo et al., 2009).

It was impossible to increase the intensity of the exercise in order to reach minimum energy expenditure. The exercise intensity of diabetes dance had reached an optimum level at aerobic zone of moderate intensity. Higher exercise intensity stimulated a higher level of lactate. It is necessary to find an alternative method to increase higher energy expenditure without any changes in repetition, exercise intensity and lactate level.

5 CONCLUSIONS

In this study, diabetes dance version 6 did not produce significant differences in glucose tolerance, and also did not reach the energy expenditure recommended by the ADA. However, diabetes dance version 6 has met the aerobic exercise zone, as can be seen from %HRmax of 67%, and it is still below the anaerobic threshold value, judging by the lactate level measured post-exercise (1.78mmol / L). We suggest further improvements should be made to the movements of the diabetes dance, in accordance with the progress of existing science and technology.

REFERENCES

Chambers et. al, 2009. Stretch stimulated glucose uptake in skeletal muscle is mediated by ros& p38 MAPK. J.Physiol 587:13
IDF. 2006. Cost Effective Approaches to Diabetes Care and Prevention
Seo et. al, 2009 atf4 regulates obesity, glucose homeostasis, & energy expenditure. Diabetes 58: 2565 2573