

The Effectiveness of Combined Warm Water Foot Submerging and Breath Relaxation Therapy on Lowering the Blood T Pressure in Hypertensive Patients in the Work Area of Puskesmas Penumping Surakarta

by Nurul Makiyah

Submission date: 25-Sep-2019 10:48AM (UTC+0700)

Submission ID: 1179560314

File name: il_Review_The_2nd_Inter_Conference_The_2nd_Life_Science_2016.pdf (3.91M)

Word count: 10128

Character count: 59887



2nd ICHMS & 2nd LSC

PROCEEDING

PROCEEDING

The 2nd International Conference of Medical and Health Sciences (ICMHS) and The 2nd Life Sciences Conference (LSC) 2016

*"Towards a Better Quality of Life
through Interdisciplinary Research"*

Yogyakarta, 9th-10th December 2016
The Alana Hotel and Convention Center

ISBN: 978-602-757-793-0



9 786027 157793 0





PROCEEDING

The 2nd International Conference of Medical and Health Sciences (ICMHS) and The 2nd Life Sciences Conference (LSC) 2016

*"Towards a Better Quality of Life
through Interdisciplinary Research"*

Yogyakarta, 9th-10th December 2016
The Alana Hotel and Convention Center

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

TABLE OF CONTENT

COMMITTEE	viii
WELCOMING SPEECH	
Welcome Message from Comittee	ix
Welcome Message from Dean	x
Welcome Message from Rector	xi
Welcome Message from the Head of Provincial Health Office Special Region of Yogyakarta	xiii
KEYNOTE SPEAKER OF INTERNATIONAL CONFERENCE	xv
REVIEWER	xvi
FULL ARTICLE	
Diabetic Neuropathy - A Chance Towards A Better Treatment <i>Tri Wahyuliati</i>	2
Herbal Medicine a Holistic Approach; in Case of Food Supplement Formulation of <i>Sauropus androgynus</i> and <i>Elephantopus scaber</i> to Modulate Immune and Hormonal System in Pregnant <i>Salmonella typhi</i> Infected Mice <i>Muhammad Sasmito Djati</i>	10
Continuing Competence of Practicing Nurses in Indonesia <i>Fitri Arofiati, SKep.,Ns, MAN Ph.D</i>	19
The Influence of Neuromuscular Taping (NMT) in Walking Speed for the Patients After Ischemic Stroke <i>Umi Budi Rahayu</i>	29
Correlation between Larvae Free Number with DHF Incidence in Sleman, Yogyakarta, Indonesia <i>Tri Wulandari Kesetyaningsih, Sri Andarini, Sudarto, Henny Pramoedyo</i>	34
Correlation Interdialytic Weight Gain-Idwg towards Physical and Psychological Health to Quality of Life in Patients with Hemodialisa <i>Cecilya Kustanti, Maria Putri Sari Utami</i>	42

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Quality of Life in Hemodialysis Patiens with Hypertension <i>Maria Putri Sari Utami, Elsy Maria Rosa, Azizah Khoiriyati.....</i>	48
Environmental Housing Characteristic of Pulmonary Tuberculosis Sufferers in Slum Area <i>Iwan Stia Budi, Yustini Ardillah, Indah Purnama Sari, Dwi Septiawati</i>	55
Exploration Study in Psychological Changed on First Trimester Pregnant Women at Kembaran II Health Center, Banyumas <i>Wilis Dwi Pangesti, Dewi Ambarwati, Inggar Ratna Kusuma</i>	63
The Anxiety of Pregnant Mother with History of Abortion in Health Service 2 Banyumas Qualitative Study <i>Evicenna Naftuchah Riani, Wilis Dwi Pangesti, Diah Atmarina Yuliani</i>	72
Analysis of Infection Control Risk Assessment and Strategies to Reduce Health-Care Associated Infections in RS PKU Muhammadiyah Gamping Yogyakarta <i>Nurmalita Sari, Elsy Maria Rosa.....</i>	76
Health Promotion Program for Disaster Eruption of Mount Merapi Refugee in Youth Centre SlemanDstric, Yogyakarta Special Province, Indonesia <i>Novitasari Ratna Astuti.....</i>	91
Pap Smear is Important Screening of Cervical Cancer for Women <i>Ivanna Beru Brahmana.....</i>	100
Analysis of Compliance on Implementing Standard Precautions on Dental Health Service at PKU Muhammadiyah Gamping Hospital of Yogyakarta <i>Maria Margaretha S Nogo Masa, Elsy Maria Rosa</i>	108
Qualitative Study of Stakeholders' Knowledge Regarding Alert Village Program in Ogan Ilir Regency <i>Asmaripa Ainy, Iwan Stia Budi.....</i>	123
The Influence of Parents Knowledge and Health Care Access to the Identification of Children with Hearing Impairment <i>Asti Widuri, Alazi, Muhammad Pringgo Arifianto</i>	131

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

The Comparison of Maternal Leukocytosis Incidence between Preterm Premature Rupture of Membranes and Premature Rupture of Membranes at Term in Panembahan Senopati Hospital Bantul Yogyakarta <i>Choirotun Jum'iyatin Nisak, Supriyatiningih</i>	137
Analysis of Patient Safety Culture Instrument by MaPSaF <i>Arum Astika Sari, Arlina Dewi</i>	143
The Relationship of Fish Consumption to Cognitive Development in Students of SD Saptosari, Gunungkidul, Yogyakarta <i>Dewi Ngaisyah</i>	158
Inter Professional Education and Collaborative Practice: Reflection from Health students <i>Wiwik Kusumawati, Ika Setyawati, Romdzati, Likky Tiara Alphianti</i>	164
Steroidal Saponin in Ethanol Extract Tuber of Purple Yam (<i>Dioscoreaalata L.</i>) Decrease IL-4 Density of Blood Sera on BALB/c Mice Model Digestive Tract Allergy <i>Sri Nabawiyati Nurul Makiyah, Muhaimin Rifa'i, Widodo, Muhammad Sasmito Djati</i>	173
Managerial Leadership Competence in PKU Muhammadiyah Hospital of Gamping <i>Ranggit Oktanita, Qurratul Aini, Ekorini Listiowati</i>	184
Malaria Occurrence Factor Analysis Based on Elevation of Sea Surface in the District of OganKomeriungUlu, South Sumatra <i>Pademi Alamsyah, Chairil Anwar, Dwi Setyawan, Laila Hanum</i>	200
Increasing Family Involvement to Reduce of Cigarette Consumption with Participatory Learning Action (PLA) Approach <i>Tri Hastuti Nur Rochimah, Salmah Orbayinah</i>	212
Air Pollution Effect to Human Health in Palembang City <i>Marsidi, M.T. Kamaluddin, Fauziah N. Kurdi, Novrikasari</i>	230
Identification of Patient Satisfactory Profile for Outpatient Pharmaceutical Service at Private and Government Hospital within Semarang District <i>Pramitha Esha Nirmala Dewi, Novita Dwi Dahliyanti</i>	241

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Intervention of Family Nutritional Awareness to Increase Family's Food Security <i>Fatmalina Febri, Anita Rahmiwati, Fenny Etrawati</i>	249
The Effects of Exercises in Molecular Neuron Cells of Cerebellum in Congenital Hypothyroidism Rats <i>Idiani Darmawati, Marten Bhara Suryo Aji, Zulkhah Noor</i>	258
The Effect of Air Freshener Exposure on Corneal Thickness of White Rat (<i>Rattus norvegicus</i>) <i>Yuningtyaswari, Pajar Sigit Nugroho</i>	265
The Correlation between Education about Personal Hygiene and Knowledge and Attitude of Personal Hygiene of the Adolescent <i>Kusbaryanto, Wahana</i>	272
The Relationship between Sports Activities and Premenstrual Syndrome In SMA N 1 Sentolo, Kulon Progo <i>Fenthy Vabiella, Alfaina Wahyuni</i>	277
Relationship Thyroid Status to the Physical Growth and Psychomotor Development on Children Under 2 Years in Endemic Areas of Iodine Deficiency Disorders in District Samigaluh of Kulonprogo Regency <i>Adang Muhammad Gugun, Zulkhah Noor, Jifani Rasyad, Mardylla Nur Fitriany</i> ..	282
Baby Blood Vessel Detection-Based Touch Sensors <i>Ade Pajar Pirdianto, Anna Nur Nazila Chamim</i>	299
Analysis of Factors that Influence Smokers Using Alcohol among Students in a Private University in Yogyakarta <i>Iman Permana, Gibran Ilham Setiawan</i>	306
The Effectiveness of Combined Warm Water Foot Subm _{er} sion and Breath Relaxation Therapy on Lowering the Blood T Pressure in Hypertensive Patients in the Work Area of Puskesmas Penumping Surakarta <i>Prima Trisna Aji, Novita Kurnia Sari, Sri Nabawiyati Nurul Makiyah</i>	315
Assessment of Interprofessional Communication and Collaboration: Using Multi Methods <i>Sri Sundari Purbohadi</i>	335

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Bed Side Teaching as Effort for Decreasing Needle Stick and Sharp Injury in Clinical Practice Students of PSIK FKIK UMY <i>Azizah Khoiriyati, Novita Kurnia Sari</i>	342
The Relationship between Working Period and Cholinesterase Blood Levels among Pesticides-Spraying Workers in the Oil Palm Plantation <i>Restu Dewi Lestari, Merry Tiyas Anggraini</i>	350
The Effect of Interpersonal Relationship toward Birth Satisfaction <i>Hema Dewi Anggraheny</i>	356
Effect of Early Mobilization Education of The Level Anxiety and Independence of Patients After Total Knee Replacement in Hospital <i>Amik Muladi, Sagiran, Azizah Khoiriyati</i>	363
The Effect of Normal Dose Extract Gempur Batu Kejibeling (<i>Strobilanthus crispus.BL</i>) to the Histological of Rat's Digestive Tract <i>Yoni Astuti, Ali Usodo Mulyo, Harminani</i>	371
Effectiveness of Alcohol 70%, Clorhexidine Gluconate 4% Soap and Irgasan DP 300 as Hand Sanitizers in Reducing Bacterial Growth <i>Inayati, Pinter Hartono</i>	377

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Committee of ICMHS & LSC 2016

Supervisor	dr. Ardi Pramono, Sp.An, M.Kes
Chair	dr Iman Permana, M.Kes, Ph.D
Partner	Dr Zahid Iqbal, Ph.D
Secretary	Winnie Setyonugroho, S.Ked, MT, Ph.D
Secretariat	dr Bramantyas Kusuma H, M.Sc Futuh Hidayat, SEI Elida Tri Grahani, SE
Treasury	dr Hidayatul Kurniawati, M.Sc
Scientific section	Dr dr Ikhlas M Jenie, M.Med, Sc Dr Sri Nabawiyati Nurul Makiyah, S.Si, M.Kes Lia Fitriana, SP
Programme section	dr Ika Setyawati, M.Sc dr Imaniar Ranti, M.Sc dr Ahmad Ikliludin, SpM
Publication and Documentation section	dr April Imam Prabowo Arif Hadianto, ST
Logistic and Transportation	dr Muhammad Kurniawan, M.Sc Aris Nuryanta, SH Muhammad Ma'rifatullah Katiga Putra Dwi Hatmo Budi, S.IP
Fund Raiser	dr Maria Ulfa, MMR dr Akhmad Syaiful Fatah Husein, SpAn

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**Chair person of The 2nd International Conference of Medical and
Health Sciences and The 2nd Life Sciences Conference 2016**



Welcome to Jogja, sugeng rawuh!

For the second time, the Faculty of Medicine and Health Sciences Universitas Muhammadiyah Yogyakarta is going to conduct the 2nd International Conference of Medical and Health Sciences (ICMHS) this December in vibrant Yogyakarta, Indonesia. This year we are going to collaborate with the Life Sciences Society of Pakistan for their 2nd Life Sciences Conference (LSC) with Dr. Zahid Iqbal as the general secretary.

This year's conference theme "Towards a better quality of life through interdisciplinary research" will be celebrating an era of seamless interdisciplinary integration and collaboration in scientific innovations with the involvement of more extensive topics and disciplines in the conference. We aim to exhibit the products of that kind of approach in solving challenges, improving the quality of life, and creating sustainable developments. We are happy to announce that our conference is filled with Invited speakers from Pakistan, United States of America, Uni Emirates Arab, Malaysia and Indonesia. Presentations will be conducted in oral as well as poster that covers topics from medicine, public health, dentistry, pharmacy, biomedical to agriculture. To put more credibility to the conference we are collaborating with Isra Medical Journal and the Asian Journal of Agriculture and Biology to publish selected papers from the event. Other paper will be published in the ISBN Proceeding book.

The last but not least, enjoy the conference, start networking and sharing ideas, and let immerse yourself to the heritage cultural ambient of Jogja, sumonggo!

Yogyakarta, 1st December 2016

dr. Iman Permana, M.Kes, Ph.D.

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**Dean of Faculty of Medicine and Health Sciences,
Universitas Muhammadiyah Yogyakarta**



Assalamu'alaikum Wr. Wb.

Science, especially in the areas of health and life growing more rapidly. We need to work together in the research of various disciplines to the advancement of science and to provide benefits to human life.

After successfully organized international scientific meeting last year, the Faculty of Medical and Health Sciences Universitas Muhammadiyah Yogyakarta, held the second scientific meeting ICMHS along with "2nd Life Sciences Conference". In this second scientific meeting, FKIK UMY collaborates with various researchers, among others from Pakistan, Malaysia, and the United States. Taking the theme "Towards a better quality of life through interdisciplinary research" we hope to establish cooperation with various parties to be able to contribute ideas to the civilization of human life.

Finally, we congratulate the scientific meeting in the city of Yogyakarta Indonesia. Enjoy the beautiful city of Yogyakarta with priceless historical relics. We hope that this meeting can run smoothly and provide benefits to the advancement of knowledge.

Wassalamu'alaikum Wr. Wb.

Yogyakarta, 1st December 2016

dr. Ardi Pramono, M.Kes, Sp.An.

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Rector of Universitas Muhammadiyah Yogyakarta



Assalaamu'alaikum Wr. Wb.

Ladies and Gentlemen,

Welcome to the 2nd International Conference on Medical and Health Science in conjunction with the 2nd Life Sciences Conference 2016

Welcome to Yogyakarta City of Tolerance

Our Faculty of Medicine and Health Sciences has been doing such international conference almost every year for the last ten years. This and other previous conferences are the things that supporting our vision as an excellence and Islamic university, a young and global university. We will always try to keep monitoring the development of science through sending more lecturers to do the sabbatical leave overseas, doing international research collaborations and also the international conference. Each department should do this strategy of internationalization so that each department has its own network. Faculty of medicine and health science is one of the most progressive units in implementing this strategy by inviting international experts on a regular basis. This program will certainly strengthen our vision.

International conference on medicine and health sciences is a smart choice to offer our lecturers access to the most recent development of the subjects. The participants will also gain the same knowledge and latest information on medicine and health sciences. As everyone knows that the development of science and technology are faster today compared to the previous period. Information technology, computer, and other development have fastened the transformation of medicine and health science into the different and more complex stage.

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

Cellular technology, for instance, can be used for several functions including those that directly impacts our daily life. There is no long distance call anymore today because cellular phone can do everything we need to contact other people far from where we stand anytime anywhere. People will finally innovate cellular phone for the sake of personal health services. We will in the future using our simple cellular phone to detect our body temperature, blood pressure, even how much fat we have in our body and how much it is supposed to be. We may also be able to check the health of our body without leaving our house and order medicine without going into the drug store. Everything is almost possible as long as we think hard for the better of people in the future. Enjoy the conference and don't forget to visit our rich tourist destinations, mountains, beaches or caves (underground waterways).

Thank you

Wassalaamu'alaikum Wr. Wb.

Prof. Dr. Bambang Cipto, MA

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Keynote Speech

**by Head of Provincial Health Office Special Region of Yogyakarta
in International Conference
of Medical and Health Sciences and Life Sciences Conference**

The Alana Hotel and Convention Center, Yogyakarta, December 9-10, 2016

The honorable:

- Rector of Muhammadiyah University of Yogyakarta,
- The Dean of Medical and Health Sciences Muhammadiyah University of Yogyakarta,
- The chairman of organizing committee of the international conference of medical and health,
- Distinguished guests and colleagues.

Assalamu'alaikum Warahmatullahi Wabarakatuh,

First of all, we thank God for His blessings that today we may attend the International Conference of Medical Health Towards a Better Quality of Life Through Interdisciplinary Research in Yogyakarta.

My distinguished colleagues,

In Indonesia National Long Term Development Plan (2005-2024), the Indonesian Ministry of Health have determined a paradigm shift that have governed health services in health development plan. There has been a shift from Curative Health Services to Preventive and Promotive Health Services.

Recently, Indonesia suffers from a triple burden of diseases as health development challenges. The triple burden of diseases are: 1) the backlog of common infections, undernutrition, and maternal mortality; 2) the emerging challenges of non-communicable diseases (NCDs), such as cancer, diabetes, heart disease; and 3) mental illness, and the problems directly related to globalization, like pandemics and the health consequences of climate change.

Dear colleagues,

Here are some data that show several health problems in Indonesia:

1. Maternal mortality rate in 2015 is 4,809 cases, infant mortality rate in 2015 is 22,267 cases;
2. Regarding to children under the age of five, the national stunting rate is 37.2% which consists of 18% for very short dan 19.2% for short (Riskesdas 2013);

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

3. HIV testing coverage is 14% dan antiretroviral (ARV) therapy coverage is 65.58% (Directorate General of Disease Control and Prevention Ministry of Health, 2015);
4. Tuberculosis (TB) notification rate in 2015 is 73.5% and tuberculosis treatment success rate is 72% (Directorate General of Disease Control and Prevention Ministry of Health, 2015).

Distinguished guests,

Indonesia Health Development Program in 2015-2019 strengths in improving human quality life through Health Indonesia Program with family approach. The Indonesian Ministry of Health issued The Minister of Health Regulation (Permenkes) No. 39 Year 2016 as a Guideline of Implementation of Health Indonesia Program with Family Approach. This program has 12 main indicators as markers of a family health status. Currently, many health programs have been implemented by Indonesian Ministry of Health, Provincial Health Offices, and District Health Offices. However, many health problems, some as mentioned above, still become health burdens. We may ask a question whether the programs that we conducted have answered the health problems we have in Indonesia.

It would be better if all health programs that we implement based on scientific health research, especially interdisciplinary research. The research should be related to detection, prevention, and treatment of diseases or problem solving for better health.

My dear colleagues,

Being a province with speciality, Special Region of Yogyakarta placed Traditional Medicine as one of the priority programs in Provincial Medium Term Development Plan (2017-2022). We still encounter many challenges in developing Traditional Medicine, especially in providing services which are based on scientific evidence.

Distinguished colleagues,

We look forward to results of interdisciplinary research which would support health problem solving, especially by developing traditional medicine in Yogyakarta. We believe that collaboration in interdisciplinary research would improve quality of human life.

Finally,

Thank you for your attention. We wish you a successful conference.

Wassalamu'alaikum Warahmatullahi Wabarakatuh,

On behalf of
the Head of Provincial Health Office
Special Region of Yogyakarta

Drg. Pembajun Setyaningastutie, M.Kes

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**SPEAKER OF
INTERNATIONAL CONFERENCE**

Zahid Iqbal

Al-Nafees Medical College Isra University Islamabad Campus Islamabad, Pakistan
"One Health Program for Public Health Benefit"

Prof. Dr. Abdul Khaliq

Professor, Department of Agronomy, University of Agriculture, Faisalabad
"Role of Agriculture in Poverty Alleviation of Rural Areas"

Fitri Arofati

Universitas Muhammadiyah Yogyakarta, Indonesia
"Continuing Professional Development of Practicing Nurses in Indonesia"

Tri Wahyuliati

Universitas Muhammadiyah Yogyakarta, Indonesia
"Diabetic Neuropathy - A Chance Towards A Better Treatment"

Mohammad Khalid Ashfaq

University of Mississippi, USA
"Natural Products –Use or Misuse"

Muhammad Mukhtar

American University of Ras Al Khaimah, United Arab Emirates
"Emerging Biotechnologies and Genomic Medicines in Human Health and Well-Being"

Muhammad Sasmito Djati

Brawijaya University Malang, Indonesia
"Herbal Medicine a Holistic Approach: in case of food supplement formulation of Sauropusandrogynus and Elephantopuscaberto modulate immune and hormonal system in pregnant Salmonella typhi infected mice"

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

REVIEWER

1. Dr. Zahid Iqbal, Ph.D (Isra University, Islamabad, Pakistan)
2. Prof. Dr. Abdul Khaliq (University of Agriculture, Faisalabad)
3. Dr. Mohammad Khalid Ashfaq, DVM, DTVM, MS, Ph.D (University of Mississippi, USA)
4. Dr. Muhammad Mukhtar, Ph.D (American University of Ras Al Khaimah, United Arab Emirates)
5. Dr. Ir. Muhammad Sasmito Djati, MS. (Brawijaya University Malang, Indonesia)
6. Fitri Arofiati, S.Kep., Ns., MAN., Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
7. Dr. SN Nurul Makiyah, S.Si., M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
8. dr. Iman Permana, M.Kes, Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
9. Dr. dr. Ikhlas M. Jenie, M.Med, Sc (Universitas Muhammadiyah Yogyakarta, Indonesia)
10. Dr. dr. Arlina Dewi, M.Kes, AAK (Universitas Muhammadiyah Yogyakarta, Indonesia)
11. dr. Oryzati Hilman, M.Sc, CMFM (Universitas Muhammadiyah Yogyakarta, Indonesia)
12. Dr. Dra. Yoni Astuti, M.Kes, Ph.D (Universitas Muhammadiyah Yogyakarta, Indonesia)
13. Dr. drg. Tita Ratya Utari, Sp. Ort (Universitas Muhammadiyah Yogyakarta, Indonesia)
14. Dr. dr. Tri Wahyuliati, Sp.S, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
15. Dr. Elsy Maria Rosa, M.Kep (Universitas Muhammadiyah Yogyakarta, Indonesia)
16. Dr. dr. Titiek Hidayati, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
17. Dr. Shanti Wardaningsih, M.Kep., Ns., Sp.Kep.J., Ph.D. (Universitas Muhammadiyah Yogyakarta, Indonesia)
18. Dr. dr. Sri Sundari, M.Ke (Universitas Muhammadiyah Yogyakarta, Indonesia)
19. Dra. Lilis Suryani, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
20. Drh. Tri Wulandari K, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
21. Dr. dr. Wiwik Kusumawati, M.Kes (Universitas Muhammadiyah Yogyakarta, Indonesia)
22. Sabtanti Harimurti, S.Si., M.Sc., Ph.D., Apt. (Universitas Muhammadiyah Yogyakarta, Indonesia)

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

**SPEAKER OF
INTERNATIONAL CONFERENCE**

ICMHS-P-1-25

**The Effectiveness of Combined Warm Water Foot Submerging and
Breath Relaxation Therapy on Lowering the Blood T Pressure in
Hypertensive Patients in the Work Area of Puskesmas Penumping
Surakarta**

Prisma Trisna Aji^{1*}, Sri Nabawiyati Nurul Makiyah²

¹ Nursing Master Study Programme of Postgraduate Program
Universitas Muhammadiyah Yogyakarta

² Faculty of Medicine and Health Science Universitas Muhammadiyah Yogyakarta

*Email: prima.trisna.2014@pasca.umy.ac.id

Abstract

Hypertension is a global health problem requiring attention because it is the main cause of death. The long-term uncontrolled hypertension may result in impaired vision, coronary occlusion, renal failure and stroke. For that reasons, there should be an immediate management to lower the blood pressure without side effect, non-pharmacological management in the form of combined warm water-foot submerging and deep breathing relaxation therapy. The aim of this research is to find out the effectiveness of combined warm water-foot submerging and deep breathing relaxation therapy on the lowering blood pressure in Hypertensive patients in work area of Puskesmas Penumping Surakarta. This study was a quasi experimental research. The population of research was hypertensive patients present in Puskesmas Penumping Surakarta in 2014, with the mean number of 175 per month. The sample of research consisted of 20 respondents taken using purposive random sampling technique. Technique of collecting data used was observation sheet. Technique of analyzing data used was one-group paired sample t-test while two-group test was conducted using Mann Whitney test. There was a difference of effect between before and after the administration of warm water-foot submerging therapy on the lowering systolic and diastolic blood pressures in hypertensive patients with p value of 0.000 and 0.001; (2) There was a difference of effect between before and after the administration of deep breathing relaxation on the lowering systolic blood pressure in hypertensive patients with p value of 0.02, but no difference on diastolic blood pressure with p value of 1.000; 3) the combined warm water-foot submerging therapy was more effective than the deep breathing relaxation therapy on the lowering systolic blood pressure in hypertensive patients with p value < 0.05 in the work area of Puskesmas Penumping Surakarta.

Keywords: Combined Warm Water-Foot Submerging Therapy, the Deep Breathing Relaxation Therapy, Hypertension

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

INTRODUCTION

Hypertension is a global health requiring attention because it is the leading cause of death in both developed and developing countries. About 26.6 % of men and 26.1% of women develop hypertension in the world population and these figures predictably will increase to 29.2% in 2025. The prevalence of hypertension in Indonesia increases over time. The 2009 data of RI's Ministry shows that the prevalence of hypertension is 29.6% and increased to 34.1% in 2010 (Apriany, 2012).

The number of hypertension cases in the last three years (2011-2013) in Surakarta is 143,365 cases and that in 2012 is 14.9%. Hypertension is one of diseases with the highest number of case compared with other diseases in Surakarta City. Considering the data of Surakarta DKK, the highest number of hypertensive cases in Puskesmas Penumping Surakarta is 198,645 cases.

Non-pharmacological medication is the one deriving from natural ingredients; these ingredients are obtained easily with relatively low cost. Non-pharmacological medication in the form of natural therapy includes herbal therapy, nutrition therapy, progressive relaxation, meditation, laughing therapy, acupuncture, acupressure, aromatherapy, reflexology, and hydrotherapy including foot submerging in warm water (Sudoyo, 2006).

A study on this matter has been done by Santoso (2015). The similarity of Santoso's study and this current research is that one of their variables is the same, conducting a research on the effect of warm water-foot submerging on the lowering hypertension in elder patients. Meanwhile the difference of them is that Santoso's study was conducted in Puskesmas Khatulistiwa, Pontianak City and only used one variable with elder hypertensive patients as the respondents. Meanwhile this research was taken in the work area of Puskesmas Penumping Surakarta with warm water-foot submerging and breathing relaxation variables in lowering hypertension. Meanwhile the respondents taken are hypertensive patients aged 34-75 years.

The use of breathing relaxation as non-pharmacological management and independent nursing intervention can lower blood pressure and anxiety among primary hypertensive patient in Indonesia. Suwardianto's study (2011) on blood pressure in hypertensive patient found that breathing relaxation technique can lower blood pressure.

The physiology of breathing relaxation lowers blood pressure in the patient developing stress (tension) and anxiety. In high blood pressure, the nerve working is sympathetic nervous system serving to improve the heart beat. Breathing relaxation works reciprocally thereby removing anxiety and lowering blood pressure. Sympathetic nervous system will increase blood pressure that for a moment will increase blood pressure when the response occurring, increasing the speed and strength of heart beat and narrowing most arterioles, but widening them in certain area (for example skeletal

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

muscle needing more blood supplies), reducing water and salt disposal by kidney, thereby increasing the blood volume in the body: releasing epinephrine (adrenaline) hormone and norepinephrine (noradrenaline) stimulating heart and blood vessels. Stressor is one factor triggering the increasing blood pressure with the process of releasing epinephrine and norepinephrine hormones (Endang, 2014).

Ervan's (2013) study found that there is the change of blood pressure in hypertensive patient after the implementation of deep breathing relaxation therapy. The similarity of research lies on the variable (deep breathing relaxation therapy), and the respondent (hypertensive patients). The difference is that Ervan's research used one variable only (deep breathing relaxation), while this current study uses warm water-foot submerging and deep breathing relaxation. Another difference lies on Ervan's (2013) study investigating the change of blood pressure rather than the lowering of blood pressure.

This combined warm water-foot submerging and deep breathing relaxation therapy is used because it can help the blood vessel muscle maintain the elasticity of arteries. In addition, the warm water-foot submerging and deep breathing relaxation therapy can be done concomitantly in the patient. The advantage of deep breathing relaxation is that it can deal with the high blood pressure and heart beat dysrhythmia, reduce headache, back pain, and other pain and sleep disorder. The response of deep breathing relaxation and warm water-foot submerging to lowering blood pressure is the widened blood vessel in vasodilatation process in sympathetic nervous system that for a moment will increase blood pressure as long as the response increase the heart beat rate and strength and the narrowed arterioles, but widened arterioles in certain areas (for example, skeletal muscle needing more blood supply), reduced water and salt disposal by kidney, thereby increasing the blood volume in the body: releasing epinephrine (adrenaline) and norepinephrine that stimulates the heart and blood vessel (Triyadini, 2010).

From the result of preliminary study conducted on the people in the work area of Puskesmas Penumping Surakarta, it can be found that majority people have the higher rank of hypertension incidence and do not know the accessibility and affordability of deep breathing relaxation nursing care implementation to lower blood pressure. So far, the people in the work area of Puskesmas Penumping Surakarta only come to the health facility to have their health examined when there is a complaint.

For the people in the work area of Puskesmas Penumping Surakarta, the high prevalence of hypertension and their inadequate knowledge on non-pharmacological method to lower blood pressure in hypertensive patient make the author interested in conducting a study entitled "*The Effectiveness of Combined Warm Water Foot Submerging and Breath Relaxation Therapy on Lowering the Blood Pressure in Hypertensive Patients in the Work Area of Puskesmas Penumping Surakarta*".

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

MATERIALS AND METHODS

This study was conducted from July to August 2016. The type of research used was Quasi-Experiment research aiming to reveal the effect of adaptive manipulation on the respondent. The population of research was hypertensive patients present in Puskesmas Penumping Surakarta in 2014 consisting of 175 per month. The sample of research consisted of 20 respondents taken using purposive random sampling technique. The research instrument used was observation sheet with "One Med" Aneroid mercury Spigmomanometer. Technique of analyzing data used was one-group paired sample t-test while two-group test was conducted using Mann Whitney test.

RESULTS AND DISCUSSION

Table 1. The mean ($\bar{x} \pm SD$) of Blood Pressure (mmHg) for Hypertensive Patient before the administration of combined Warm Water-Foot Submerging and Deep Breath Relaxation Therapies on the lowering Blood Pressure in the area of Puskesmas Penumping Surakarta

Variable	N	Blood Pressure ($\bar{x} \pm SD$)	Min	Max
Pre-test of combination systolic	20	166.75 \pm 14.35	150.00	200.00
Pre-test of combination diastolic	20	94.00 + 5.02	90.00	100.00
Pre-test of systolic for deep breathing relaxation	20	168.50 + 13.48	150.00	200.00
Pre-test of diastolic for deep breathing relaxation	20	96.00 + 4.98	80.00	100.00

Table 2. The mean ($\bar{x} \pm SD$) of Blood Pressure (mmHg) for Hypertensive Patient after the administration of combined Warm Water-Foot Submerging and Deep Breath Relaxation Therapies on the lowering Blood Pressure in the work area of Puskesmas Penumping Surakarta

Variable	N	TD	Min	Max
Pre-test of combination systolic	20	128.00 \pm 4.41	120.00	135.00
Pre-test of combination diastolic	20	83.75 + 6.66	70.00	100.00
Pre-test of systolic for deep breathing relaxation	20	164.00 + 13.92	145.00	190.00
Pre-test of diastolic for deep breathing relaxation	20	96.00 + 5.98	80.00	100.00

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

Table 3. The mean ($x \pm SD$) of lowering Blood Pressure (mmHg) for Hypertensive Patient after the administration of combined Warm Water-Foot Submerging and Deep Breath Relaxation Therapies on the lowering Blood Pressure in the work area of Puskesmas Penumping Surakarta.

	Warm water-foot submerging combination		Deep Breathing Relaxation	
	Systolic	Diastolic	Systolic	Diastolic
BP	38.75 ± 15.38	10.25 ± 9.24	4.50 ± 4.55	0.00 ± 3.24
Minimum	15.00	0.00	-10.00	10.00
Maximum	70.00		15.00	10.00

Table 4. The mean ($x \pm SD$) respondent frequency based on the lowering Blood Pressure (mmHg) in the combined Warm Water-Foot Submerging therapy in the work area of Puskesmas Penumping Surakarta

Variable	N	BP Before	BP After	P
Systolic BP	20	166.75± 14.35	128.00± 4.41	0.000
Diastolic BP	20	84.00± 5.02	83.75± 6.66	0.001

*Notes:

- N : Number of research respondents
 BP : Blood pressure
 SD : Standard Deviation
 P : Probability

Table 5. The mean ($x \pm SD$) respondent frequency based on the lowering Blood Pressure (mmHg) in the deep breathing relaxation therapy in the work area of Puskesmas Penumping Surakarta

Variable	N	BP Before	BP After	P
Systolic BP	20	168.50± 13.48	164.00± 13.91	0.002
Diastolic BP	20	96.00± 5.98	96.00± 5.98	1.000

*Notes:

- N : Number of research respondents
 BP : Blood pressure
 SD : Standard Deviation
 P : Probability

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

Table 6. The result of Mann-Whitney Test on the lowering Blood Pressure (mmHg) with the combined Warm Water-Foot Submerging therapy in the work area of Puskesmas Penumping Surakarta

Variable	Treatment	Blood Pressure	Std. Error	P
Combined systolic BP	Warm water-foot submerging	38.75 ± 38	3.43	0.000
	Deep breathing relaxation	4.50 ± 4.56	1,019	
Combined Diastolic BP	Warm water-foot submerging	10.25 ± 9.24	2.07	0.000
	Deep breathing relaxation	0.00 ± 3.24	0.725	

Source: Processed Primary Data

DISCUSSION

The effectiveness of Combined Warm water-foot submerging therapy.

There is a difference of blood pressure lowering pretest and posttest scores after the administration of combined warm water-foot submerging therapy. There is a decrease in the mean score of systolic blood pressure with combined warm water-foot submerging therapy from 166.75 mmHg (before) to 128.00 mmHg (after). The result of Wilcoxon Signed Rank Test for the combined warm water-foot submerging therapy group obtains p value of 0.000 in the lowering systolic blood pressure.

The mean score of lowering diastolic blood pressure in hypertensive patients is 94.00 mmHg (before) and 83.75 mmHg (after) the administration of combined warm water-foot submerging therapy. The result of Wilcoxon Signed Rank Test for the deep breathing relaxation therapy treatment group obtains p value of 0.001 in the lowering systolic blood pressure. Considering the result of analysis, it can be found that there is a significant difference of blood pressure between before and after the administration of warm water-foot submerging in hypertensive patients in the work area of Puskesmas Penumping Surakarta.

The respondents undertake warm water-foot submerging therapy for 10-15 minutes at 32°C– 35°C. The warm water-foot submerging therapy is conducted once a day for 7 (seven) successive days, indicating that there is a significant difference of blood pressure after the warm water-foot submerging therapy. After the administration of therapy, post-test is conducted so that the author can see or get the result of blood pressure measurement showing that there is a significantly lowering blood pressure after the administration of combined warm water-foot submerging therapy (Kusumastuti, 2011).

This result of research is supported by Santoso's study (2015) indicating that there is an effect of warm water-foot submerging therapy on lowering blood pressure. This research found that the warm water-foot submerging therapy lowers the blood

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

pressure significantly in hypertensive patients.

The effectiveness of Deep Breathing Relaxation Therapy for Hypertensive Patients. There is a difference of blood pressure lowering pretest and posttest scores in hypertensive patient using deep breathing relaxation therapy. The increase in the systolic blood pressure lowering score is 168.50 mmHg (before) and 164.00 mmHg (after) the deep breathing relaxation therapy. The result of Wilcoxon Signed Rank Test on the treatment group with breathing relaxation therapy obtained the systolic blood pressure lowering with p value of 0.002, while there is no decrease of diastolic blood pressure - 96.00 mmHg before and 96.00 mmHg after – the administration of deep breathing relaxation therapy in hypertensive patients. The result of Wilcoxon Signed Rank Test on the treatment group with breathing relaxation therapy obtained the diastolic blood pressure lowering with p value of 0.100.

Considering the result of analysis, it can be found that there is a difference of lowering systolic blood pressure after the administration of deep breathing relaxation therapy treatment, while there is no difference of diastolic blood pressure. This diaphragm respiratory relaxation therapeutic technique is very good to be done everyday by the hypertensive patients in order to help relaxing the body muscles, particularly blood vessel, thereby maintaining the elasticity of arteries and helping lower the blood pressure (Endang, 2014).

In this research, the respondents undertake breathing relaxation therapy in an inspiration through nose and expiration through mouth aiming to reducing tension and anxiety. This therapy is conducted 6-8 times a day in the morning for 7 (seven) successive days. After the therapy, blood pressure is measured again (post test) to find out whether or not there is a significant difference of systolic blood pressure after the deep breathing relaxation therapy. But the result shows that there is no difference of diastolic blood pressure between before and after the deep breathing relaxation therapy.

The deep breathing relaxation therapy is more effective in previous studies because in this research the author employed diverse respondents in determining inclusive criterion. In addition the administration of different pharmacological therapy is due to the difficulty of finding hypertensive respondents corresponding to the inclusive criteria, particularly in the same pharmacological therapy administration because the areas are different as well.

The effectiveness of the combined warm water-foot submerging and deep breathing relaxation therapy on the lowering Blood Pressure (mmHg) in Hypertensive Patients in the work area of Puskesmas Penumping Surakarta. There is an effect of the combined warm water-foot submerging and deep breathing relaxation therapy on the lowering systolic Blood Pressure (mmHg) in Hypertensive Patients in the work area of Puskesmas Penumping Surakarta. The result of Mann Whitney obtains p

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

value of 0.000. In the combined warm water-foot submerging therapy treatment group, there is a decrease by 38.75 mmHg in systolic blood pressure and by 10.25 mmHg in diastolic blood pressure. Meanwhile, the deep breathing relaxation therapy group, it can be found the mean decrease by 4.50 mmHg in systolic blood pressure and by 0.00 mmHg in diastolic blood pressure. From the result of research, it can be summarized that the combined warm water-foot submerging is more effective than deep breathing relaxation therapy in lowering the blood pressure in hypertensive patients. This result in line with Santoso (2015) finding that there is an effect of warm water-foot submerging on the lowering blood pressure.

After the respondents have undertaken the combined warm water-foot submerging therapy for 10-15 minutes at water temperature of 32°C-35°C for 7 (seven) successive days, indicating that there is a significant difference of blood vessel after the administration of combined warm water-foot submerging therapy. After the therapy, blood pressure is measured again (post test) indicating that there is a significant decrease in blood pressure after the administration of warm water-foot submerging therapy. The mean score of decrease is 38.75 mmHg in systolic and 10.25 mmHg in diastolic blood pressure. The deep breathing relaxation therapy is undertaken 6-8 times a day for 7 (seven) successive days, indicating that there is a difference of blood pressure in hypertensive patients. Considering the result of posttest, it can be found the decrease by 4.50 in systolic and by 0.00 in diastolic blood pressures.

Considering the result of measurement on the combined warm water-foot submerging and deep breathing relaxation therapies, it can be found that the mean decrease of blood pressure in group treatment (combined warm water-foot submerging therapy) is higher than that in the control group (deep breathing therapy) so that it proves that the combined warm water-foot submerging therapy lowers the blood pressures very effectively in hypertensive patients.

From the result of research conducted, it can be found the decrease of blood pressure among the respondents is varied. It is because every individual has different body response. Considering the mean blood pressure before the administration of combined warm water-foot submerging therapy (166.75 mmHg for systolic and 94.00 mmHg for diastolic BP), the hypertension category belongs to moderate category. This statement is confirmed by Sudarta (2013) classifying hypertension in adult with systolic blood pressure of 160-179 mmHg and diastolic of 90-100 mmHg into Borderline hypertension category.

The working mechanism of warm water-foot submerging therapy is conduction principle in which there is a transfer of heat/warmth from water to the body leading the blood vessel to widen and reducing the muscle strain thereby making the blood circulating smoothly that will affect artery pressure by baroreceptor in sinus cortices and

**The 1st International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

arcus aorta that will deliver impulse carried by the nervous fiber carrying signal from all parts of body to inform the brain the blood pressure, blood volume and special need of all organs to the sympathetic nervous center to medulla thereby stimulating systolic pressure indicating with the ventricular muscle tension that will stimulate the ventricle to contract (Santoso, 2015).

In the beginning of contraction, the aorta and semilunar valves have not been opened. To open the aorta valve, the pressure in the ventricle should exceed the aorta valve pressure. The condition in which ventricular contraction begins thereby widening the blood vessel, leading the blood stream to run smoothly, thereby encouraging the blood to enter into the heart and lowering its systolic pressure. In diastolic pressure, the isovolemic ventricular relaxation condition during ventricular relaxation, dramatically lowering pressure in ventricle, and smooth blood stream with the widening of blood vessel will lower diastolic pressure. Therefore, it can be stated that there is a significant relationship between the warm water-foot submerging and the lowering systolic and diastolic blood pressure (Perry & Potter, 2010).

This result is confirmed by Suandika's (2015) study finding that submerging the foot with warm water makes the blood circulates smoothly. This research indicated that the effect of foot submerging with warm water can lower the blood pressure and can make the blood circulate smoothly because of vasodilatation in the blood vessel of submerged foot areas.

The characteristics of respondents constituting the hypertensive patients in the work area of Puskesmas Penumping Surakarta undertaking the combined warm water-foot submerging and deep breathing relaxation therapies include more women than men. It is in line with Basuki Setianto (2011) conducting a study in Cijeruk Bogor finding that the number of women developing hypertension is more than that of men. Meanwhile, at education level, most respondents have Junior High School education, and work as merchants. These characteristics triggers the recurrent incidence of hypertension as well because merchant profession requires an individual to wake up earlier to prepare the commodity and no time spent for doing exercise in the morning.

In the term of income, most hypertensive patients in the work area of Puskesmas Penumping Surakarta are dominated with the low-income society. Meanwhile the nutrition status is distributed evenly including: poor, good, excessive and obese nutrition statuses. It is in line with Prisma Trisna Aji's (2009) study on the Relationship of Income Level and Nutrition Status to Hypertension Recurrence in Puskesmas Gilingan Surakarta.

Meanwhile, for the stress level, the hypertensive patients in the work area of Puskesmas Penumping Surakarta rarely develop stress, and it does not affect the result of research conducted by the author. Meanwhile, the number of sleeping hour is

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

dominated by the hypertensive respondents with sleeping time more than 8 hour a day. Similarly, sleep disorder is dominated by the hypertensive patients rarely developing sleep disorders such as insomnia and etc. The natrium consumption more than 2 spoons a day is dominated by the respondents rarely consuming natrium more than 2 spoons a day.

Considering the result of research, it can be seen that the administration of combined warm water-foot submerging therapy is very effective to be used in lowering the blood pressure of hypertensive patient in the work area of Puskesmas Penumping Surakarta. From the result of research, it can be found that to deal with hypertension, a combined warm water-foot submerging can be done because it is cheap, easy and can be done independently.

CONCLUSION

There is a different effect between before and after the administration combined warm water-foot submerging therapy on the lowering systolic and diastolic blood pressure in the hypertensive patients with p value of 0.000 and 0.001. There is a different effect between before and after the administration of deep breathing relaxation therapy on the lowering systolic blood pressure in the hypertensive patients with p value of 0.02, but there is no different effect on the diastolic one, with p value of 1.000. The combined warm water-foot submerging therapy is more effective than the deep breathing relaxation therapy in lowering the blood pressure in hypertensive patients in the work area of Puskesmas Penumping Surakarta with p value < 0.05.

This result of research is expected to increase the experience in conducting research so that the researcher will be motivated to improve his self-potential in relation to the management of high blood pressure and to develop non-pharmacological therapy that can lower the blood pressure effectively in the hypertensive patients.

REFERENCES

1. Apriany. (2012). *Prevalensi Penderita Hipertensi di Indonesia*. Bandung. PT Alumni.
2. Sudoyo. (2006). *Hidroterapi Air Hangat terhadap Tubuh. Cetakan Ketiga*. Jakarta : Salemba Medika
3. Santoso, B. (2012). *Buku Saku Diagnosis Keperawatan*. Edisi 8. Alih Bahasa: Monica Ester. Jakarta : Penerbit Buku Kedokteran EGC.
4. Suwardianto H. (2011). *Efektivitas Relaksasi Nafas Dalam pada Penderita Hipertensi di Puskesmas Wilayah Selatan Kota Kediri*. Diakses 15 November 2016 dari puslit2.petra.ac.id/ejournal/index.php/stikes/article/download/18257.
5. Endang T. (2014). *Pelayanan Keperawatan Bagi Penderita Hipertensi Secara Terpadu*. Yogyakarta : Graha Ilmu Edisi Ketiga.

**The ¹2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

6. Ervan.(2013). *Panduan Menurunkan Tekanan Darah dengan Gaya Hidup*. Diakses 27 Desember 2015 dari <http://Gayahidupsehatonline.com>.
7. Triyadini (2010). *Efektifitas Terapi massage dengan Terapi Mandi Air Hangat terhadap penurunan Insomnia Lansia*. Malang:Jurnal Keperawatan Sudirman.
8. Kusumuastuti (2011). *Pengaruh Rendam Air Hangat pada Kaki dalam Meningkatkan Kuantitas Tidur Lansia*. Jombang : Universitas Pesantren Tinggi Darul Ulum Jombang. Jombang
9. Sudarta (2013). *Efek Hidroterapi terhadap Kualitas Hidup Myalgia*. Jakarta.
10. Potter & Perry. (2010). *Fundamental Keperawatan Edisi 7 Buku 2*. Jakarta. Salemba Medika.
11. Suandika.(2015). *Manfaat Hidroterapi untuk Penderita Hipertensi*. *Jurnal Keperawatan*. Jakarta
12. Setianto, B. (2011). *Hubungan Jenis Kelamin dengan angka kejadian Hipertensi*. Universitas Indonesia. Jakarta.
13. Prisma Trisna Aji's (2009). *Hubungan Status Gizi dan Pendapatan terhadap tingkat kekambuhan terhadap tekanan darah pada pasien hipertensi di Wilayah kerja Puskesmas Gilingan Surakarta*. Universitas Muhammadiyah Surakarta. Surakarta

ICMHS-P-1-26

The Difference of Radiological Characteristics between Giant Bullous Emphysematous and Pneumothorax

Ana Maidawati*, Anggita Putri Kantilaras

Staffs of Radiology Department, Faculty of Medicine and Health Sciences,
Universitas Muhammadiyah Yogyakarta

*Email: anamjdw2@gmail.com

Abstract

Background: Giant Bullous Emphysematous (GBE) is developed from bullous lung parenchyma diseases and is resulted from multiple causes. The Images between GBE with pneumothorax are similar and difficult to differentiate. Both are emergency cases that prompt diagnosis might mean proper treatment and life saving. This was a case study presenting a case of a 27-years-old-man to emergency room with dyspnoe. Respiratory rate of 32 and coarse upper breath sounds with diminished breath sounds at the right lung. Chest Computed Tomography (Chest CT) and Chest X Ray (CXR) images at right lung has shown a large coalescing bulla which trapped air and fluid, compressed the adjacent lung parenchyma with resultant ipsilateral volume loss, air fluid level and thin walls. Smaller bullous lesions were also seen in the left upper lobe. Results: the difference characteristics between chest CT and CXR GBE compared to pneumothorax were: 1) the location of lesions: GBE was within the lung and pneumothorax was in pleural space; 2) The shape of the lesions: GBE, oval, thin walled-less than 1 mm may be formed by pleura, septa or compressed lung tissue. Pneumothorax: with linear density outlining distinct lucent area with broncho vascular marking 3.) Complications: GBE caused minimal mediastinal shifts line and spontaneous pneumothorax. Pneumothorax with large areas caused greater mediastinal shift line. Conclusions: chest CT and CXR were important to determine between GBE and pneumothorax based on the location, the shape of the lesions and complications.

Keywords: Giant Bullous Emphysematous, pneumothorax, characteristic of lesions, chest x ray, chest ct scan

**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

INTRODUCTION

Giant Bullous Emphysematous (GBE) or Vanishing Lung Syndrome is Bullous lung disease is a spectrum of disease with multiple causes that presence of air in the cavity more than one third of the hemithorax in lung parenchyma. These Giant Bullous develop from centrilobular or paraseptal emphysematous lung with Chronic Obstructive Pulmonary Diseases (COPD). Clinical symptoms patients maybe asymptomatic or experience hypoxia, severe dyspnea and chest pain.^{1,2} These GBE more often seen in young men and in cigarette smokers. However, GBE also been described in non-smokers and patients with immunodeficiency Syndrome (deficiency of alpha 1-anti protease), smokers, drug abuse injections, sarcoidosis, genetic disorders such as Boccherini or Have Ehlers syndrome and cystic lesions on Lung parenchyma lung Damage.^{2,3} The Size of GBE varies from 1 to 20 cm and an average of 2-8 cm, asymmetrical and can be enlarged on the hemithorax. Giant bullae form when adjacent areas of paraseptal emphysema coalesce, and are therefore usually subpleural in distribution. Bullae are described as air-filled spaces exceeding 1cm in size with a wall thickness less than 1mm. It was originally hypothesized that bulla formation was due to a "ball-valve mechanism" in which gas entered the lesion but could not exit. Over time, the bullae would enlarge with subsequent destruction and compression of adjacent lung parenchyma. Newer research, however, suggests there is negative intrabullous pressure, similar to pleural pressure, and is thus preferentially ventilated during inspiration with loss of elastic recoil preventing air from being expelled. Giant bullae usually form in areas of parenchymal weakness, tends to preferentially affect the upper lobes, is often asymmetric in distribution and often progressive in nature.^{1,2,4}

It is limited by the Bullae of lung parenchyma which is a form of fibrous tissue that can form trabeculae alveolar septal.³

Chest X Ray (CXR) of GBE will classically demonstrate a white linear density (pleura) outlining a distinct area of black pleural space where bronchovascular markings are absent because of these similarities, it can be difficult to differentiate bullae from pneumothorax. Both the case is same emergency and has treatment is very different. The surgical action is indispensable in the case of GBE, is on pneumothorax management with the inserted chest tube to the air so that expenditure can be minimized lung compressed. The accurate diagnosis indispensable due to either GBE or pneumothorax is a case of emergency that need immediate handling to save sufferers to prevent further complications and mortality of patients. The complications of GBE is pneumothorax and CXR can find two abnormal with careful observation. CXR is sometimes less accurate to diagnose this case so that it is necessary to other modality of radiology such as Chest CT and thoracic ultrasound. The purpose of this case report is to determine the characteristics of CXR and Chest CT scan between GBE compared pneumothorax so that enforcement of the diagnosis and treatment can be done immediately and complications can be minimized.^{2,3}

CASE REPORT

A 27 years old man presented to the emergency department of hospital with complaints of chest feels pain, dyspneu, productive cough and low grade fever. He had a history of of smoking about 5 years and emphysema. He seem shortness of breath with sternal and intercostal retractions. Vital sign s upon presentation: blood pressure shows 130/90 mmHg, pulse 90, respiratory rate 32 and temperature 37^oC. Physical examination demonstrated respiratory distress, with coarse upper breath sounds and diminished breath sounds at the bases right lung. auscultation: decreased breath sounds over the right middle and basal lung fields. Tactile fremitus right chest wall is less than the left. Chest X Ray (CXR) demonstrating a large right midle and basal lung bulla with internal layering of fluid (containing an air fluid level), oval shape, thin walls, costofrenikus sinus sharp and right diaphragm is flattened. Bronchovascular marking lung field seems increased and lung parenchyme compressed to medial, minimal mediastinal shift line to contralateral with giant bullous and hyperinflation in both the lung.. Chest CT scan demonstrating extensive lung bullous in right lung with thin-walled- less than 1 mm and luscent centrilobular and paraseptal luscent lesions in left lung field. Tracheal and mediastinal shift to the left and and bronchovascular marking in left lung is increased.



Figure 1



Figure 2

Figure 1 and 2. Chest X Ray : the luscent wide oval shape lesion in right lung with thin-walled, the infiltrate into basal lobe lung (Giant Bullae). Hyperinflasi both the lung, right diaphragm had flattened. Minimal Shift line mediastinal and trakhea to the left

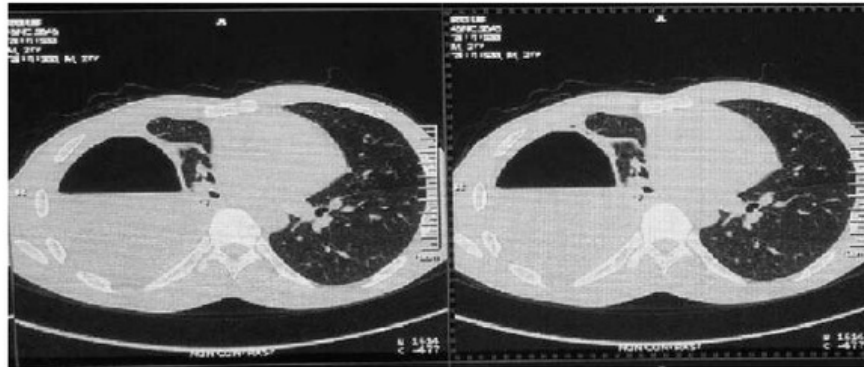


Figure 3

Figure 4

Figure 1. Chest CT Scan: lucent oval shape lesion in right lung containing air fluid level. Compressed lung parenchyme to medial near mediastinal. Lucent lesions, small, thin walls, multiple, limits firmly in left lung. Bronchovascular marking in left lung seem to increase.



Figure 5



Figure 6

Figure 2. Chest CT Scan: Giant bullae with septal lucent lesions in the anterior of the basal-right lung. The infiltrate in parenchyme basal of the right lung. It seems compressed lung parenchyme to medial with the outlines fibrosis and lucent lesions. Multiple small bullous with diameter average 1-3 cm in the superior lobe (centrilobular and paraseptal) with hyperaerasi in left lung. Trachea and mediastinum is shifting a little to the left. Right diaphragm is flattened.

DISCUSSION

The imaging of Chest X Ray or Chest CT scan between GBE with Pneumothorax very similar. Both are equally contains the air so that it appears luscent lesion that filled spaces that occupy more than one-third of the hemithorax and unbounded firmly. The both of case is an emergency cases requiring immediate diagnosis, because will cause failed breath, due to lung parenchyme compression so hypoxia and respiratory distress which can cause death. The complications can cause permanent destroyed lung parenchyme that can continue to be a tear in the visceral pleura, causing the formation of fistulopleura and become pneumothorax. Giant Bullae can be divided according to Klingman become two type, namely 1). Type 1, Giant Bullae with pulmonary tissue surrounding normal bullae (20% of patients), most the cigarette smoking young age, presence of immunodefisiensi syndrome (deficiency of alpha 1-anti protease) that is characterized by dilatation of the air fill space in parenchyme. The location of the lesions are usually symmetrical in the apex of the both of superior lung lobe. Giant Bullae so-called Vanishing Lung syndrome, Bullous lung disease, pneumopathy or bullous disease of the Primary lung type.^{1,2,3,5} 2). Type 2, occurred because a continuation of the existence of chronic pulmonary tissue damage (Emphisematous lung or COPD) which causes dilation of the air space of lung parenchyme (centrilobullar and paraseptal) or a combination of several small luscent lesions in the form of bullae with smaller size can unite to form the air contains luscent lesions with a large size, called the GBE. The characteristis GBE is abnormal lung parenchyme around bullae (centrilobular or paraseptal emphysematous). The incidence GBE with abnormal parenchme is 80% of patients. The location of the lesions are often asymmetrical on ipsilateral hemithorax, occupies the superior lobe is sometimes extended to lung lobe medius.^{2,3}

GBE and pneumothorax diagnosis of enforcement is important as initial CXR to give an overview of the condition of the lung and surrounding tissues are useful as screening. Chest X Ray is easy, inexpensive and almost all hospitals have X ray. Chest X Ray weakness its accuracy is less because there is some description of the lesion-covered or not seems a result of superposition. Other modality another is chest CT scan that more better than the CXR. Lesions in the lung field can be seen more clearly because of the thoracic thin section and the pieces can be confirmed in 3 dimensions, i.e., axial, coronal and sagittal. Lesions or bullae or small Pneumothorax can be more visible than the CXR.^{3, 5, 6}

There are some diagnosis GBE, is pneumatocele, cavitas, cystic masses, bleb and pneumothorax. This case report, there are several things that distinguish between GBE with pneumothorax. This is important because both have a very similar imaging and is an emergency case that need immediate handling. Characteristics of CXR and chest CT scan on the GBE distinguishes pneumothorax are 1) the location and the type

1
**The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016**

of lesion: GBE, a cavity containing air due to lung parenchyme air space damage, often in superior lobe and medius are being pneumothorax in the form of air in the pleural cavity, location can be anywhere from part of hemithorax 2). The shape of the lesion: GBE, oval shape, thin walled-less 1 mm can be formed from the pleura of lung parenchyme sections and viscerae on the other side, septal alveolar; pneumothorax: luscent lesions without bronchovascular marking in the pleural space, between parietale and viscerae pleural; 3.) Complications: GBE contralateral mediastinum shifts is minimal, pneumothorax with large areas pose a midline shift of mediastinum is severe until maximal. Lung Parenchyme around the lesion on GBE can be accompanied by damage, but can also be normal. Pneumothorax can cause lung parenchyme collaps (atelectasis) accompanied the withdrawal of fissura. 4). On a flattened of diaphragm accompanied by GBE on the side of the lesion, pneumothorax is not. 5). the difference with GBE with pneumothorax, is a chest tube after placement in the lung parenchyma of GBE not returned expands to fill hemithorax (the image of the lung field narrower post insertion of chest tube), pneumothorax is, lung parenchyme re-inflates to fill hemithorax.^{3,4}

Figure 7



Figure 8

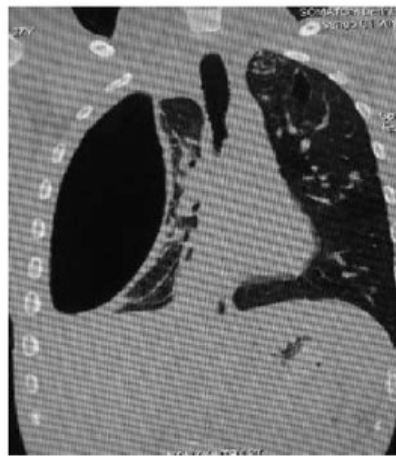


Figure 3. GBE on COPD (type 2), centrilobular emphisematous di pulmo sinistra , asymeric



Figure 9



Figure 10

Figure 4. Picture of CXR and CT coronal Giant Chest Bullous on normal lung (type 1).⁷



Figure 11

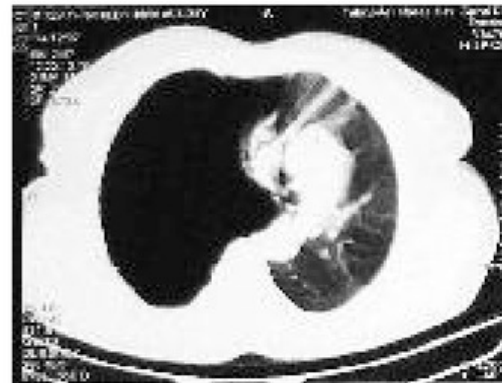


Figure 12

Figure 5. Pneumothorax is lucent area without bronchovascular marking it shows a lung in a right hemithorax push mediastinal and trachea to shift to the left. They Compared with Midline shift on GBE, Pneumothorax greater shift of mediastinal to the contralateral.⁸

The most common complication of GBE is pneumothorax. Chest X Ray difficult to distinguish GBE with complications pneumothorax. The modalities of Chest CT is very helpful to see more clearly the existence of a pneumothorax due to the tearing of the pleural wall limiting viscerale bullae so that air goes into the pleural cavity. Important signs that should be known in the presence of pneumothorax with Chest CT scan on a GBE is a double-wall sign. The surgical indication of action five points in the GBE are, increasing the size of the bullae, pneumothorax, decreased lung function, hemoptysis and bullae are infected.^{2,3}

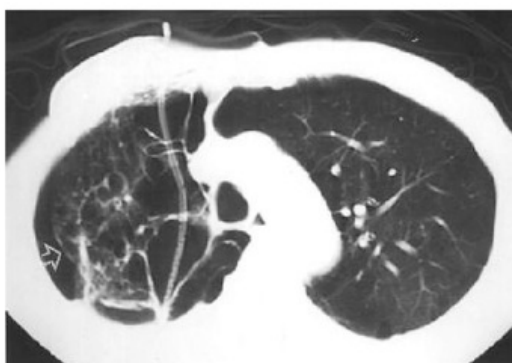


Figure 13

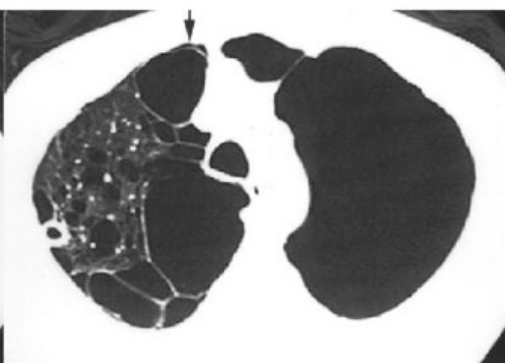


Figure 14

Figure 6. Arrow Showed A Picture of A Double Wall Sign, Which Means on A GBE Complications of Pneumothorax.⁹

CONCLUSION

Chest X Ray and Chest CT Scan is important to determine the diagnosis of GBE with pneumothorax which includes the location and type of lesion, lesions form and complications that occur. Some characteristics radiology of the GBE and pneumothorax to diagnosed are important to know because both are emergency cases that require immediate management.

The management of GBE different with pneumothorax. GBE is surgery performed, lobectomy, thoracotomi. Patients on case report had some clinical symptoms based on the above, the description of the CXR and Chest CT scan diagnosis is type 2 GBE with COPD and therapeutic treatment is toracotomi, lung lobectomy on which there are lesions of the GBE.

1
The 2nd International Conference of Medical & Health Sciences
and
The 2nd Life Sciences Conference 2016

REFERENSI

1. Goldberg, C. and Carey K, E. Bullous Lung Disease. *West J Emerg Med*. 2013; 14 (5): 450–451.
2. Gelabert, C. and Nelson; M. Case Report: Bleb Point: Mimicker of Pneumothorax in Bullous Lung Disease. *Western J Emergency Med*, 2015; XVI, (3): 448-447.
3. Sokouti, M and Golzari, S. A Case Report: A Giant Bulla of the Lung Mimicking Tension Pneumothorax. *J Cardiovasc Thorac Res*, 2010; 2 (2): 41-44.
4. Greenberg JA, Singhal S, Kaiser LR. Giant Bullous Lung Disease: Evaluation, Selection, Techniques and Outcomes. *Chest Surg Clin N Am*, 2003; 13 (4): 631-649.
5. Gayle, M. Waitches GM, Stern EJ, Dubinsky TJ. Original Report: Usefulness of the Double-Wall Sign in Detecting Pneumothorax in Patients with Giant Bullous Emphysema. *AJR*, 2000; 174: 1765–1768.
6. Agarwal R and Aggarwal AN, Bullous Lung Disease or Bullous Emphysema? *Respiratory Care*, 2006; 51 (5): 534-532.
7. Lindsey RB. Vanishing Lung Syndrome. *N Engl J Med*, 2014; 370: 9.
8. Sokouti M and Golzari S. *J Cardiovasc Thorac Res* 2010
9. Gayle M, Waitches GM, Stern EJ, Dubinsky TJ. *AJR* 2000

The Effectiveness of Combined Warm Water Foot Submerging and Breath Relaxation Therapy on Lowering the Blood T Pressure in Hypertensive Patients in the Work Area of Puskesmas Penumping Surakarta

ORIGINALITY REPORT

4%

SIMILARITY INDEX

%

INTERNET SOURCES

4%

PUBLICATIONS

%

STUDENT PAPERS

PRIMARY SOURCES

1

"CONFERENCE CALENDAR", Asia-Pacific Biotech News, 2015

Publication

2%

2

Basheer Tashtoush, Fernando Gonzalez-Ibarra, Roya Memarpour, Anas Hadeh, Laurence Smolley. "Vanishing Lung Syndrome in a Patient with HIV Infection and Heavy Marijuana Use", Case Reports in Pulmonology, 2014

Publication

1%

3

Chatterjee, Surajit, Rajatsubhra Saha, and Ritam Chakraborty. "A Giant Bulla of the Lung Mimicking Hydro-pneumothorax with Contra Lateral Mediastenal Shifting", Journal of Medicine, 2014.

Publication

1%

4

Hardiyanti, Ridwan M. Thaha, Syamsiar S. Russeng. "Drug Adherence with Hypertension Status at the Bajoe Community Health Centre of Bone Regency in 2016", Proceedings of the

1%

2nd International Conference on Medical and Health Informatics - ICMHI '18, 2018

Publication

Exclude quotes On

Exclude matches < 1%

Exclude bibliography Off