THE EFFECTS OF ANNONA MURICATA LEAVES TOWARDS BLOOD LEVELS OF CXCL9 AND LYMPHOBLAST (STUDY IN CEREBRAL MALARIA PHASE OF SWISS MICE)

Thesis

Master Biomedical Sciences

By
MOHAMED M. Y. GADALLA
NIM. 22010114419012

MEDICAL FACULTY
DIPONEGORO UNIVERSITY
SEMARANG
2015

APPROVAL PAGE

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By

MOHAMED M. Y. GADALLA

NIM. 22010114419012

Had been defend in front of the defence committee

on August on 28th , 2015

and has been approved by,

Supervisor I	Supervisor II
Prof. dr. Edi Dharmana, PhD, Sp.ParK	Dr.dr. RA Kisdjaminatun, RMD,M.Sc
NIP. 19470312 197603 1 001	NIP. 19640130 199003 2 001

Endorsed by,

Head of Master degree Program in Biomedical Sciences

Faculty of Medical Diponegoro University

dr. Achmad Zulfa Juniarto, M.SiMed, Sp Amd,PhD

NIP. 197006081997021001

DEVELOPMENT MONITORING SHEET
RESULT RESEARCH OF THESIS

I, who signed below stated that I agree with **Correction of Thesis** which was submitted on August 28th , 2015 from :

Name of student : MOHAMED M.Y. GADALLA
Student Identification Number : 22010114419012
Title : The Effects of *Annona muricata* Leaves Toward Blood Levels of CXCL9 and Lymphoblast (Study in Cerebral Malaria Phase of Swiss Mice)

NO	NAME	EXAMINER	SIGNATURE DATE
1.	dr. M. Hussein Gasem, PhD, Sp.PD-KPTI	Head of Examiner	
2.	Prof.dr. Edi Dharmana, M.Sc, PhD, Sp.ParK	Supervisor	
3.	Dr.dr. RA. Kisdjamiatun RMD, M.Sc	Co-Supervisor	
4.	Dr.dr. Andrew Johan, M.Si	Examiner	

DECLARATON

I hereby declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education , there are no elements belonging plagiarism forth in decree no. 17 of 2010. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of reference is give.

Semarang,

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MOHAMED M.Y
GADALLA

FOREWORD

Assalamu'alaikum Wr. Wb.

Praise to Allah Almighty for all grace and guidance that thesis with the title **"** The Effects Of *Annona muricata* Leaves Towards Blood Levels of CXCL9 and Lymphoblast (Study in Cerebral Malaria Phase of Swiss Mice **)** **"**can be resolved. This thesis is structured to meet one of the requirements to obtain a Master degree in Biomedical Sciences (MSi. Med) in the field of Immunology at the Faculty of Medicine, University of Diponegoro.

I realized that without the help and guidance of the various parties, it is not easy for me to finish this thesis. Therefore, on this occasion, the author would like to express respect and gratitude as possible to:

1. The rector of Diponegoro University who has provided an opportunity for authors to improve science learning.
2. Dean of the Faculty of Medicine, University of Diponegoro who has provided the opportunity for the author to participate in education.
3. Chairman Master of Biomedical Sciences Faculty of Medicine, University of Diponegoro who has provided motivation and support to the author to complete his education on time.
4. Prof.dr. Edi Dharmana, M.Sc, PhD, Sp.ParK . as the First Counselor who has been willing to take the time, effort, and thought to guide the writer for completing this thesis.
5. Dr. dr. RA. Kisdjamiatun RMD, M.Sc. as the second Counselor who has been willing to invest time, energy and mind to guide the writer for completing this thesis**.**

6. dr. Sudaryanto, M.Pd.Ked, as the Head of the Laboratory of Parasitology, Faculty of Medicine, University of Diponegoro and the entire laboratory staff who have given permission Parasitology and support for research.
7. Prof. Sultana M. Faradz, PhD. and the entire staff Laboratory Cebior who have given permission and support for research.
8. Dr. MI. Tjahjati DM, SpPK. as Head of Laboratory GAKI and the entire staff Laboratory GAKI who have given permission and support for research.
9. dr. Noorwijayahadi, M.Kes. and the entire staff of the Laboratory of Pharmacology of the Faculty of Medicine, University of Diponegoro who have helped me during the study.
10. Professors and Lecturers in the Master of Biomedical Sciences Faculty of Medicine, University of Diponegoro who has given his knowledge during his education writer.
11. All employees / academic staff in the program as Master of Biomedical Sciences Faculty of Medicine, University of Diponegoro who have provided assistance for the author was educated.
12. Parents and the whole loved ones who have given prayers and support during the authors studied.
13. Fellow students of Master of Biomedical Sciences Faculty of Medicine, University of Diponegoro 2014 which has been jointly studying and providing support to authors.

14. To all those who have a lot to provide assistance, but can not mention one by one author.

With limited knowledge, the authors expect criticism and constructive suggestions for the perfection of this thesis.

Finally, the authors hope that Allah is pleased to reply to all the good of all those who have helped this thesis. Hopefully, this thesis can be useful for the development of science, especially Biomedicscience.

Wassalamualaikum Wr. Wb.

Semarang, August, 2015

Writer

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ABBREVIATON

CM :Cerebral malaria

IE: infected erythrocytes

TNF-α: tumor necrosis factor alpha

IFN-γ :gamma interferon

ICAM-1 : intercellular adhesion molecule 1

C-X-C motif: chemokines most strongly implicated to have a role are the chemokine

CXCR3 : receptor 3

CXCL4 : ligand 4

CXCL9 : CXC ligand 9

Pf : *Plasmodium falciparum*

ECM :proposed as target of therapy

ANKA (PbA): *swiss* mice inoculated *P. berghei* ANKA

pRBC : Parasitized red blood cell

IFN-induced protein of 10kDa

IP-10: interferon-inducible protein of 10 kDa

CD8: cluster of differentiation 8

CD4: cluster of differentiation 4

TCR : *T cell* receptor

CSF: *Cerebrospinal fluid*

AM : *Anona muricata*

P. falciparum: Plasmodium falciparum

P.vivax : Plasmodium vivax

P. ovale : Plasmodium ovale

I-TAC : inducible T cell-chemoattractant

NK : Natural Killer

CD11b (+):cluster of differentiation molecule 11B

ECM : extracellular matrix

EP: *endothelial venules*

IP: interferon-induced

ABSTRACT

Background: Cerebral malaria (CM) forms part of the spectrum of severe malaria, with a case

fatality rate ranging from 15% in adults in southeast Asia to 8.5% in children in Africa. Many chemokines have been noted to exhibit increased expression in cerebral malaria, but the chemokines most strongly implicated to have a role are the chemokine (C-X-C motif) receptor 3 (CXCR3) binding chemokines, including chemokine (C-X-C motif) ligand 4 (CXCL4), CXCL9. **Methods:**. Swiss albino mice, female , weight 150-200 gram,8-9 week old mice divided into 6 group . K(-) is healthy mice, P1 and P2 were group without inoculated PbA with *A. muricata* dosage 100 and 150 mg/kg BW. K(+) is group with inoculated PbA, P3 and P4 were group with inoculated PbA and *A. muricata* dosage 100 and 150 mg/kg BW. Take the blood from mice's eye after mice anaesthezed. Make the spleen culture with stimulate CXCL9, incubation 72 hours and then collect the cell to efipendorf tube, spin the tube with microcentrifuge. Keep the sample to the refrigerator on -80°C to analyze the result and lymphoblast by staining with giemsa and count the percentage 100 cells .data analyze with ANOVA using SPSS. **Results:** the normality test the data is normal because p-value higher than 0.05 and CXCL 9 in all dose studied had no association with the lymphoblast in healthy swiss mice. **Conclusion:** *A. muricata* not significant reduce the level of spleen CXCL9 in *Plasmodium berghei* ANKA infected mice. *A. muricata* not significant increase the level of lymphoblast in *Plasmodium berghei* ANKA infected mice.

Keywords: CXCL9, PbA-infected mice, *A. muricata*, Lymphoblast level.

ABSTRAK

Latar Belakang: malaria serebral (CM) merupakan bagian dari spektrum malaria berat, dengan

tingkat kematian kasus mulai dari 15% pada orang dewasa di Asia tenggara ke 8,5% pada anak-anak di Afrika. Banyak kemokin telah dicatat untuk menunjukkan ekspresi peningkatan dalam malaria serebral, tetapi kemokin paling kuat terlibat memiliki peran adalah kemokin (CXC motif) reseptor 3 (CXCR3) kemokin, termasuk kemokin mengikat (CXC motif) ligan 4 (CXCL4), CXCL9. **Metode**: .swiss tikus albino, perempuan, berat badan 150-200 gram, tikus tua 8-9 minggu dibagi menjadi 6 kelompok. K (-) adalah tikus yang sehat, P1 dan P2 adalah kelompok tanpa diinokulasi PBA dengan A. muricata sediaan 100 dan 150 mg / kg BB. K (+) adalah grup dengan diinokulasi PBA, P3 dan P4 adalah kelompok dengan diinokulasi PBA dan A. muricata sediaan 100 dan 150 mg / kg BB. Mengambil darah dari mata tikus setelah tikus anaesthezed. Membuat budaya limpa dengan merangsang CXCL9, inkubasi 72 jam dan kemudian mengumpulkan sel untuk efipendorf tabung, berputar tabung dengan microcentrifuge. Menjaga sampel ke lemari es pada -80 ° C untuk menganalisis hasil dan lymphoblast dengan pewarnaan Giemsa dengan dan menghitung persentase 100 sel DATA menganalisis dengan ANOVA menggunakan SPSS. **Hasil**: uji normalitas data adalah normal karena p-nilai yang lebih tinggi dari 0,05 dan CXCL 9 di semua dosis yang diteliti tidak memiliki hubungan dengan lymphoblast pada tikus swiss sehat. **Kesimpulan**: A. muricata tidak signifikan mengurangi tingkat limpa CXCL9 di Plasmodium berghei ANKA terinfeksi tikus. A. muricata tidak peningkatan yang signifikan tingkat lymphoblast di Plasmodium berghei ANKA terinfeksi tikus.
Kata kunci: CXCL9, tikus PBA yang terinfeksi, A. muricata, tingkat lymphoblast.