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ISPHE 2015

INTERNATIONAL SEMINAR ON PUBLIC HEALTH AND EDUCATION

The 2nd International Seminar on Public Health and Education

PROCEEDINGS

Semarang, April 23, 2015

BOOK 1

Public Health Department in collaboration with Sport Education Department, Postgraduate Program, Semarang State University

Supported By :

Griffith UNIVERSITY

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PREFACE

Assalamu'alaikum warahmatullaahi wabarakaatuh,

Firstly, may we made our highest praise and thank to Allah The Almighty, for His bless so that we are able to continue a precious event; The Second International Seminar on Public Health and Education 2015 (The Second ISPHE 2015) in Semarang Indonesia, to share our knowledge and idea with so much warm and friendship from worldwide public health and education community.

The Second ISPHE 2015 is a continuation of The First ISPHE 2014 that had been held in Semarang, Indonesia on September 2, 2014. This second seminar is organized by Public Health Department in collaboration with Sport Education Department, Postgraduate Program, Semarang State University and supported by researcher team from Indonesia-Australia, Indonesian Health Education National Network (*Jejaring Nasional Pendidikan Kesehatan Indonesia* – JNPK), and Indonesian Public Health Association – Central Java (*Ikatan Ahli Kesehatan Masyarakat Indonesia Pengda Jawa Tengah* – IAKMI).

The Second ISPHE 2015 is aimed to gather all of experts, researchers, academicians, and practitioners in health education field in general as well as national and international level in one prestigious academic forum which to discuss the role of evidence based research in public health, health education, and health promotion decision making. This second seminar also proposed to contribute to the focus of health decision making; by considering the evidence based research, empirical data, and also local wisdom from each region, both national and regional levels as well as its relation to global health trends.

I would like to deliver our highest respect and appreciation to our honorable speakers, Prof. Donald, M.P.H, Ph.D. from Griffith University, Australia, Ross Sadler, B.Sc., Ph.D. from Griffith University, Australia, Min Jeung Park, Ners M.Sc., Ph.D. from University of Tokyo, Evaristo Soares from Department of Public Health Timor Leste, Ratha Phok from Institut de Technologie du Cambodge, Bashir Lakhal, M.Kes. from Department of Public Health, Lybia, and Dr. dr. Budi Laksono, M.HSc. from Health Department of Central Java, Indonesia. I really expect that this second seminar will be beneficial for all of us and to the development of the public health and education field.

Allow me to express my gratitude to all participants from Indonesia and other foreign countries who are enthusiastic in attending this seminar. I do hope that all participants will gain important values and collaborate it into our own fields and also able to make significant changes in the future. Besides, I also convey my appreciation to all organizing committee who have given their outstanding commitment for presenting this occasion.

Wassalamu'alaikum warahmatullaahi wabaraakatuh.

Sincerely Yours,
Chairman of the Committee

Dr. dr. Oktia Woro Kasmini Handayani, M.Kes.

WELCOME MESSAGE

Assalamu'alaikum warahmatullaahi wabarakaatuh,

Dear Conference Participant,

I extend my most sincere welcome to all participants of The Second International Seminar on Public Health and Education 2015, held in Semarang, Indonesia on April 23rd, 2015. Semarang State University is proud of being important part to develop public health, especially in public health education, through hosting this important event.

Semarang State University (Unnes) is one of the biggest state universities in Indonesia which was established in 1965. It is the first university that declared itself as the Conservation University in Indonesia. The idea of conservation has become its vision to be an international conservation university which is healthy, outstanding, and prosperous. Regarding the vision, Unnes determine to consistently uphold the idea of protection, preservation, utilization, and sustainable development of natural and cultural resources of Indonesia. Unnes also put conservation as a manifestation of the main duties of university, namely education, research, and community service.

In line with Unnes vision of healthy, this seminar is projected to be an international event in the field of public health education and aims to become a benchmark for decision-making in health, especially in promotion and prevention sector through evidence based research. The seminar theme, "The Role of Evidence Based Research in Public Health, Health Education, and Health Promotion Decision Making" will highlight different initiatives and projects that will help direct collective vision towards securing better health status to our nations. At this seminar, we will be able to consider application of public health research as a basic of making decision in public health area.

I am convinced that the seminar will produce valuable result for improving public health education through different presentations and discussion by our distinguished speakers and participants. I hope you find the seminar sessions and program material in framing the direction of your work. I am confident that the efforts made by all organizing committee will make it a definite success and a valuable experience for participants.

Finally, I sincerely look forward to your participation and contribution to this event.

Wassalamu'alaikum warahmatullaahi wabaraakatuh.

Sincerely yours,
Rector of Semarang State University
Prof. Dr. Fathur Rokhman, M.Hum.

WELCOME MESSAGE

Assalamu'alaikum warahmatullaahi wabarakaatuh,

Dear Conference Participant,

On behalf of Postgraduate Program Semarang State University, we are pleased and honored to welcome you to The Second International Seminar on Public Health and Education 2015. It is a great privilege for us to be in Semarang, Indonesia on April 23rd, 2015. Postgraduate Program is proud to be working jointly with researcher team from Indonesia-Australia, Indonesian Health Education National Network (*Jejaring Nasional Pendidikan Kesehatan Indonesia* – JNPK), and Indonesian Public Health Association – Central Java (*Ikatan Ahli Kesehatan Masyarakat Indonesia Pengda Jawa Tengah* – IAKMI) at this important event.

Today is a time for change and we hope that the seminar will help us in confronting this change by bringing new opportunities for advancing public health education, nationally and globally. We are expecting the seminar to offer us with new material for improving our way of thinking and operation in confronting many public health problems. This seminar proposed to contribute to the focus of health decision making; by considering the evidence based research, empirical data, and also local wisdom from each region, both national and regional levels as well as its relation to global health trends.

Let's take advantage of this excellent opportunity and work together in strengthening our regional and national network and in sharing our interests and experience, particularly in public health education field. We are confident that the seminar will help us in building our network connections and in strengthening relationship.

We would like to thank each of you for participating in The 2nd ISPHE 2015 and bringing your knowledge and skills to this event. We expect you to be engaged in the sessions and to be proactive and inquisitive. Hopefully, all of you would enjoy your stay in Semarang, Indonesia. Finally, we would like to say thanks to all the organizing committee, who made this event possible be held.

Wassalamu'alaikum warahmatullaahi wabaraakatuh.

Sincerely yours,
Director of Postgraduate Program, Semarang State University
Prof. Dr. H. Achmad Slamet, M.Si.

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ORAL PRESENTATIONS

PROBIOTIC *Lactobacillus plantarum* IS-10506 EFFECTIVENESS ON THE DEVELOPMENT OF IL-6, IgA OF ELDER'S IMUNE RESPONSE

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Abstract

Introduction: Probiotics have long been used both as a treatment for disorders of the gastrointestinal tract as well as dietary supplements. The benefits of probiotics have been extensively researched and are known, but not widely known mechanism of immunomodulatory effects of probiotics on the immune system of the elderly. The research objective was to analyze the effectiveness of the probiotic Lactobacillus plantarum IS-10 506 to increase the immune response of IL-6, and IgA LPS infection model rats Rattus norvegikus elderly Wistar strain rats compared with healthy elderly.

Method: It is an experimental research method by using the design of "The Randomized Post Test Only Control Group Design". The subjects of the study (male rats), which consists of 4 groups, each treatments that give the group given placebo (control) days 1 to 9, the group given LPS day 1, the group given Probiotics day 3 to 9 , and the group given LPS days 1 and Probiotics day 3 to 9. All groups were euthanized the day to 10. The immunohistochemical examination of the intestine using a specific monoclonal antibody is a mouse anti Rat IL-6, and IgA.

Result: The new findings in this study were: that the administration of probiotics and LPS can increase IgA levels in the elderly, scientifically proven IgA as adaptive immunity secondary phase, in which probiotic stimulation occurs switching IgM and IgG become IgA, which has a high protective power against pathogens , Giving probiotic Lactobacillus plantarum IS-10 506 and LPS affect on increasing the immune response appears from the immune response by increasing the production of IL-6 and IgA, but still in a state of homeostasis

Keywords: Probiotics, LPS, IL-6, IgA, adaptive immune, immunity elderly.

Introduction

The last two decades there is an increasing elderly population in Indonesia. The proportion of elderly population over 65 years increased from 1.1% to 6.3% of the total population. The phenomenon of the increase was due to improvements in health status as a result of advances in technology and medical research, epidemiological transition from infectious diseases towards degenerative diseases, improvement of the nutritional status of a marked increase in cases of obesity elderly from underweight, increase in life expectancy (UHH) 45 years in early 1950 towards 65 years at this point, shifting lifestyles of urban rural urban lifestyle towards sedentary lifestyle, increase in income per capita before the monetary crisis hit Indonesia (Fatmah, 2006).

Significantly the elderly experienced cases of mortality and morbidity is greater than young people. To understand the changes in the immune response in the elderly requires a study of the immune system is one of the body systems are affected by the aging process (aging). Age related to the changes in the immune system at all levels starting from molecular changes in the cells, to the different types of proteins found on the cell surface, and even change the entire organ (Whitman, 1999).

One of the major changes that occur when the body is aging is a process called "involution of the thymus." Thymus, which is located above the heart behind the breastbone, is T mature cells. T cells are a population of lymphocytes which is very special and very important that has many functions ranging from killing bacteria to help other cell types in the immune system. With the changing in the age of the human, thymus atrophy naturally. Decreased endurance so susceptible diseases of old age became the basis for searching for supplements, drugs that can help to increase endurance. One of these is a probiotic supplement. Probiotics have long been used both as a treatment for disorders of the gastrointestinal tract as well as dietary supplements. The benefits of probiotics have been extensively researched and are known, but the mechanism is unclear how probiotics can boost the immune response of the intestinal mucosa is still debated. Probiotics as live microbiota which when administered in adequate amounts can provide health benefits for the host (Fuller, 1989; FAO / WHO, 2001) in various studies based on Evidence-Based Medicine (Evidence Based Medicine), showed efficacy in some clinical conditions.

Probiotics have been demonstrated empirically, they give many health benefits. Some of the benefits of probiotics that have been demonstrated empirically, among others, increasing the mucosal immune system which is very useful for gastroduodenal mucosal defense (Goldin, 1998; Blum and Schiffrin, 2003). Probiotics also have the ability to prevent the growth and attachment of pathogenic bacteria in the gastrointestinal tract by producing and secreting antimicrobial materials such as bacteriocins and Rentericyclin. Thus probiotics is very important in the elderly. Some organic acids are also produced by the probiotic (Fuller et al. 1999; Howard et al. 2001), which has an important role in doing competition on attachment in the intestinal mucosa by pathogens and serves as a barrier and accelerate the elimination of pathogens (Suarez et al. 1998; Lim et al. 2000; Sansonetti 2006). Probiotics have biologically active molecules such as peptidoglycan and teichoic acid. This active ingredient is a microbial-associated moleculer Patterns (MAMPs), which allows probiotics can be recognized by PRRS (pattem recognition receptors) in this case TLR2 and TLR4 (Sakane, Nezu et al. 2005). Thus probiotics can act as extracellular stimulater through the ERK1 / JNK MAP kinase induces intracellular transcription factors that help certain translation process of protein synthesis.

The role of probiotics in various studies in healthy individuals to the alertness of the mucosal immune response more to explain about the alertness of the immune response in the mechanisms of adaptive immunity IgA which has promotive and preventive nature of the intestinal mucosa from exposure to pathogens (Perdigon et al., 1998; Fang et al., 2000; Isolauri et al., 2005; Dogi et al., 2008), while Galdeano (2007) clearly states that the mechanism of the alertness of mucosal immune responses are modulated by probiotics through innate immunity (Galdeano et al., 2006; Galdano et al., 2007).

Administration of lipopolysaccharide (LPS) is intended as an infection, in this study using white rats. Oral administration of LPS derived from Escherichia coli will increase the inflammatory response that stimulates the releasing of TGF-β and IL-10, and in the end also will increase the

concentration of IgA, IgM, IgE, and IgG in the intestinal mucosa. LPS also stimulates the formation of proinflammatory cytokines such as tumor necrosis factor alpha (TNFα) and interleukin-6 (IL-6) so it stimulates the balance towards Th1 cell response to further increase the secretion of IFN-γ. Cholera toxin is being giving more stimulating Th2 cell responses at mucosal (Ronco, 2000; Alexander, 2001; Perdigon, 2002).

Taking into account the importance of enhancing the role or the levels of IL-6, and IgA on improving the immune response of elderly, the researchers interested in studying **"The effectiveness of probiotic Lactobacillus plantarum IS-10 506 to Increased Number of IL-6, IgA on Immune Response Elderly".**

Method

This study was an experimental study using a design "The Randomized Post Test Only Control Group Design". The study population is white rat Rattus norvegicus Wistar strain. Samples were twenty white rats Rattus norvegicus Wistar strain ± 11 months old, weighing between 300-400 grams, and appropriate criteria for the elderly, derived from Surabaya Veterinaria by reason of changes in body weight during the study was relatively small (Smith, and Mangkoewidjojo, 1988). Large sample is 5 to one group. Therefore, there are four major groups of the total sample 20. Before being used as subjects of animal research conducted clinical evaluation and conditioned in the appropriate environment, the adaptation period (for 7 x 24 hours) to ensure that these animals are not diseased or potentially infectious, and giving the same ration as at the time of the study treatment. Before getting treatment research, screening with the inclusion criteria: Age ± 11 months, healthy mice is characterized by agile movement, eyes shining, the reed is not dull, Gender male, body weight of 300-400 grams.

The variables in this study were divided into independent variables: Probiotic Lactobacillus plantarum IS-10 506 and LPS. The dependent variables: The number of cells expressing IL-6, and IgA. Control variables: The dose of probiotics and LPS, giving way, stress factors in the white rat, Rattus norvegicus strain experimental animals Wistar strain, cage of white mice, rats maintenance and injection methods.

Besides rats this study using oral probiotic Lactobacillus plantarum material strain IS 10 which has Accession number DQ860148: IndonesiaN Probiotics native. Probiotics given at a dose of 1010 cfu / day which each rat will get a dose of 1 g / head / day. This probiotic is dissolved in MRS media as much as 2 cc and delivered through the stomach sonde every day (once daily) for 7 days for groups III and IV. Given on the third day to day kesembilan.Bahan else is lipopolysaccharide (LPS) (Escherichia coli serotype LPS 055; B5, catalog number: L5418, Sigma Chemical Co.), Singapore. LPS was given at a dose of 250 mg / kg. LPS is diluted with 0.9% NaCl solution with a ratio of 10: 1, and will be given through a gastric sonde on day one for groups II and IV just once. Laboratory examination or immunocytochemistry materials used are ether, Phosphate (the buffer), Hydrogen peroxide, antibody diluent, xylol, ethanol, peroxides, trypsin,

streptavidin, distilled water. Immunohistochemical analysis using a monoclonal antibody that is specific, Anti Rat IL-6, and the Anti-Rat IgA. Immunohistochemical staining for investigation of IL-6 and IgA.

The study was conducted at the Laboratory of Biochemistry of the Faculty of Medicine of University of Airlangga / RSU Dr. Soetomo. Immunohistochemical analysis performed at the Electron Microscopy Unit, Airlangga University Surabaya. The time needed for this study was divided into phase adjustment / adaptation for 1 week in the laboratory animal cages Airlangga Biochemistry University of Surabaya. Later stages of treatment and observation of symptoms during the 10 days of experimental animals in the stable Airlangga Biochemistry Laboratory University of Surabaya. And the last stage of research in the laboratory (against animal tissue) that is small intestine histochemical observations carried out in the laboratory of Biochemistry Unit Electron Microscopy Airangga University of Surabaya.

Having escaped in the research ethics worthiness test procedure stage adaptation of white mice for 1 week with a cage in a laboratory environment, the treatment carried out in accordance with the specified group. Group 1 and 2 is a group without being given probiotics. Group 1 is a negative control group without LPS was given, and without being given the probiotic, were given placebo for 9 days. Further treatment 2 positive control group were given LPS (75µg / rat) is a serotype of Escherichia coli LPS 055; B5 on the first day and without being given probiotics. Group 3 is the group given the probiotic Lactobacillus plantarum IS-10 506, without given LPS and started day 3 to day 4 to 9. The group is the group given the probiotic Lactobacillus plantarum IS-10 506 and given LPS on the first day followed by administration of probiotic Lactobacillus plantarum strain IS 10 506 on the third day till the ninth day (for 7 consecutive days). Rats were sacrificed after getting anesthesia with ether previously on day 10 in the morning to capture the small intestine and ileum jejenum. At the time of experimental animals are confirmed to have died, necropsy done by taking the desired organ is the small intestine and ileum form jejenum. The small intestine is cleaned and temporarily stored in liquid formalin (the buffer), prior to storage and next processing. Organs that have been preserved carried processed and fixed in order to further examination. The process for the manufacture of histological preparations through the stages dehydration, clearing, impregnation, and embedding. Paraffin method is chosen for the finalization this network. The results are analyzed by immunohistochemistry using a specific monoclonal antibody, to determine the increase in the amount of expression of specific immune system as well as anti-inflammatory cytokines / Th2 IL-6, and the amount of expression of IgA-producing cells in the small intestine mucosal cells. The results are regrouped and analyzed for each group.

Data obtained as a result of research collected in the form of primary data. Primary data in the inspection of IL-6, IgA by immunocytochemistry in UPT Microscopy Eleketron Airlangga University.

Data analysis used normality and homogeneity test for determining the parametric statistical tests / non-parametric with Shapiro-Wilk test. Inferential analysis to determine whether there is a difference arising from the treatment given to using Anova. When there is a significant

difference then continued with LSD (Least Significant Difference), to see the difference between the control group with each treatment group. Data were analyzed using 95% confidence level (α =

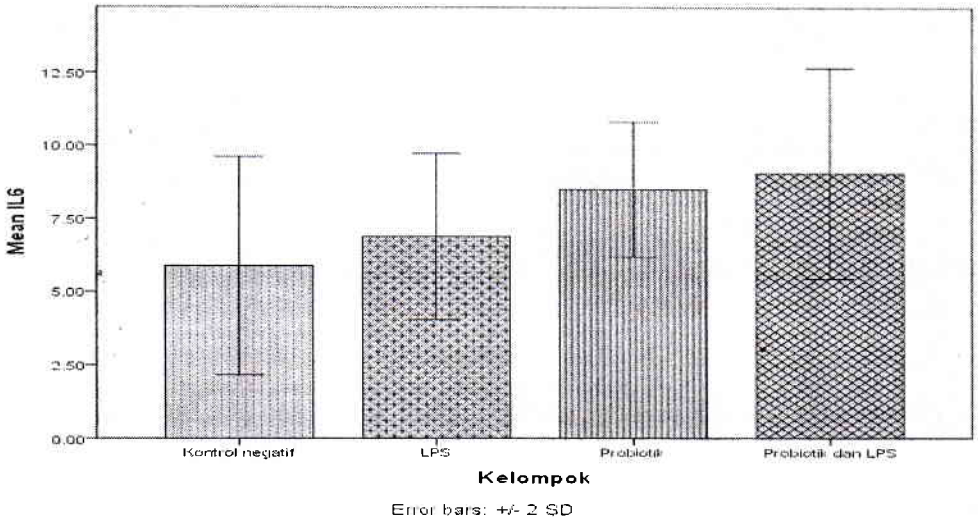
Results and Discussion

The result of homogeneity shows that there is no differences of weigth in the first process and the last process, it is also shows that the weight is not the factor which influence the test results

Table 1 Description of specific immune response of sitocyn anti inflammation/ Th 2 IL-6

	N	Mean	Std. Deviation
K-	5	5,88	1,86
LPS	5	6,88	1,42
Probiotic	5	8,50	1,16
Probiotic dan LPS	5	9,06	1,81
Total Average	20	7,58	1,95

Complete image of specific immune response of sitocyn anti inflammation/ Th 2 IL-6 of the total group can be seen in this picture



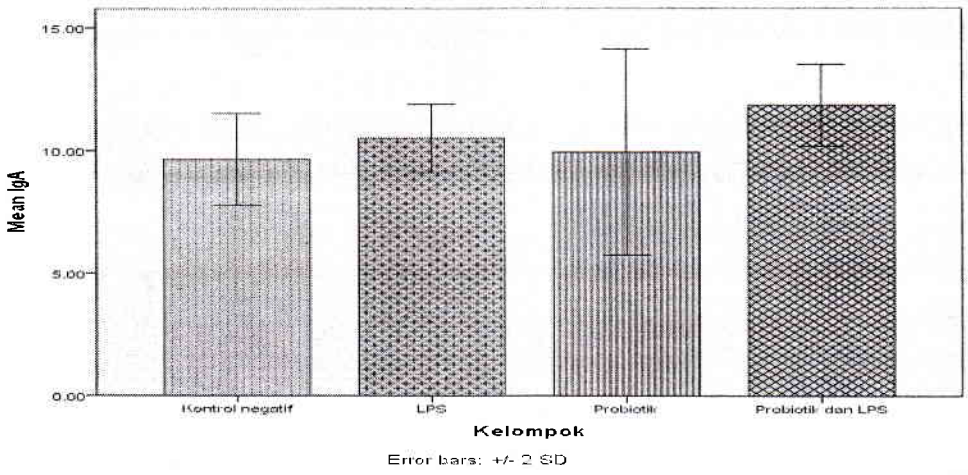
Picture 1 Specific immune response of sitocyn anti inflammation/ Th 2 IL-of all group

By giving LPS and Prebiotic significantly, can increase the specific immune response of sitocyn anti inflammation/ Th 2 IL-

Table 2 Description of total ekspresion of producing cell IgA

	N	Mean	Std. Deviation
K-	5	9,64	0,94
LPS	5	10,48	0,70
Probiotic	5	9,92	2,10
Probiotic dan LPS	5	11,82	0,84
Total average	20	10,47	1,45

The complete image of total exspression of producing cell IgA from all group can also be seen in this picture



Picture 2 total exspression of producing cell IgA form all group

With this results, the highest total production of IgA is on the group which are given probiotic and LPS.

Normality Test

Result of calculation by Shapiro Wilk test showed normal distribution of data except in CD4 + and CD4 + probiotic group on probiotic group and LPS. So that in the later stages of processing CD4 + can not use parametric statistical test to Anova but using Kruskal Wallis. The calculation result shows the variation of data homogeneity throughout marker immune response consisting of IgA, IL-2 and IL-6 homogeneous with p> 0.05. With this data illustrates there is no difference between the fourth marker data variation.

3Anova Test

Table 3 Result of Anova and Kruskal Wallis Analysis

	F	KW	Sig,
IgA	3,317		0,068
IL6	4,243		0,022*

Results of analysis using the Anova (IgA and IL-6) on the normal distribution of data showing IgA did not differ significantly (p> 0.05). Next to and IL-6 showed significantly different results (p <0.05).

Anova test results showed significantly different results of probiotic effect. However, when further scrutiny, differences in accordance with the theory that there is variation in the IL-6. While on IgA difference between groups was not significant.

In the IL-6 showed a significant difference, so it is necessary to continue with further testing of LSD. LSD test results is as follows:

Table 4 Analysis Result Post Hoc

	LSD pada IL-6
Negative	5,88[ab]
LPS	6,88[bc]
Probiotik	8,50[cd]
Probiotik dan LPS	9,06[d]

Note a,b,c,d = The same notation shows results were not significantly different

Effectiveness Probiotik of Immune Response IL-6

Results of the study of healthy elderly rats which were given probiotics significantly different immune response of IL-6 from the analysis of LSD and research results elderly mice mouse model of infection by different probiotic significant immune response of IL-6 from the analysis of LSD. Interleukin 6 is increased at a time of pathogen entry. Pathogen entry gives an alarm signal or increased interleukin 6 in the form of an increase in body temperature. At the moment there are elderly fever pathogen entry sign that interleukin 6 gives an alarm with increasing body temperature gives a signal there is an infection in the body.

IL-6 is a cytokine interleukin acting as. IL-6 acts as a mediation through the inhibitory effect of TNF-α and IL-1 (Peterson, 2005). Anti-inflammatory role of IL-6 in increased secretion of IgA has been sh

own well. This cytokine has the ability to support the development of terminal B cells in the plasma cells, and used to express IgA. Intestinal epithelial cells produce a number of cytokines IL-6. Increased IL-6 makes it possible to show that there will be an increase in IgA B-cell population. The results will show that, in the activation of the immune system by probiotics is the innate immune response (macrophages and dendritic cells).

In the administration of probiotics and LPS, the Th1 response (IL-2) were increased by the administration of LPS will not cause pathological conditions when offset by a Th2 response (IL-6) and T reg is also increased, thus forming the balance of Th1 (IL-2) - Th2 (IL-6). Probiotics can modify the immune response to offset through increased IL-4 response of Th2 cells (IL-6) (Isolauri, 2003).

After a maturation process in mesenteric lymph nodes, and through the circulation of lymph and blood circulation T cells and B cells (in the form of immunoglobulin producing plasma cell) will be returned to the mucosal effector sites. Here the end of the differentiation process occurs, with the help of cytokines including IL-6, TGF-β, B cells will be producing plasma cell immunoglobulin that will produce IgA in the intestinal mucosa.

The effectiveness of probiotics on the amount of expression of IgA-producing cells.

The results showed that the expression of IgA cells are not significant and are likely to increase in the LPS administration and probiotics. This happens because the marker IgA is an adaptive

immune system in the secondary phase. In accordance with the procedures of research on the first day of white rats get new LPS and then on the third day getting probiotics. In the first administration of LPS immunity system in the body will respond as a form of defense of the body in the primary phase. In the primary phase of the body will respond to LPS as pathogens. After the first contact with the antigen, dendritic cells of lymphoid tissue (and cell Langerhand) will induce the activation of T lymphocytes highest Antibodies formed in this phase is IgM.

On the third day, the mice get probiotics. Therefore, on the first day of the body has been recognized as pathogens, the LPS on probiotics on the third day, the rat had to save memory, causing a secondary defense. This event is referred to as secondary response because it is associated with the memory cells after administration of LPS antigen on the first day. Secondary response can vary between 10 to 50 times higher than the primary response and lasts longer. So on days 9 to 10 can still be seen an increase in IgA levels.

At this stage macrophages play an important role in antigen processing. Immunoglobulin formed in the secondary response is mostly IgA, because IgA will be a lot of good looks at the entire mucosa of the respiratory tractus, digestive and urinary. While in this study as part of the small intestine digestive tractus (Weir, 1990: 49-50).

IgA immune response begins the process of T cell activation induces the release of a number of cytokines and chemokines which play a role in the activation of B cells, isotype switching, specific integrin expression on antigen-sensitized-8 cells (Cebra, 1999; Mayer, 2000). The process of isotype switching of B cells into IgA-producing plasma cells originated from a mucosal induction. The switching process requires specific signal through kostimulator molecules including cytokines and TH cells. This process is mainly influenced by Transforming Growth Factor-□ (TGF-□) generated by Th3 cells. Th2 cells produce IL6. TGF-□ and IL-10 is a cytokine that induces IgM isotype switching into IgA by B cells (Mayer, 2005; Ezendam, 2005)

Immunoglobulin synthesis process, especially IgA and IgM preceded by antigen sampling by M cells and / or dendritic cells (DC) in the intestinal mucosa. Antigen will be captured by the receptor on the surface of dendritic cells. Depending on PAMPs of antigen, the dendritic cells will express the TLR which is the main sensor against different pathogens. Probiotics are an entry microbiota as an antigen to be captured by the M cells to the mucosal surface and will be presented by antigen presenting cells (macrophages and dendritic cells) to immature B cells or immature T cells (Matsuzaki, 1999; Blum, 2006). Macrophages and dendritic cells are indukfive sites and serves to regulate the humoral and cellular immune response to mucosal protection.

These activated T cells will differentiate into CD4 + T helper cell and will secrete cytokines. Th1 secrete IL-2, IL-3 and interferon-γ (IFNγ). While Th2 produces IL-6, another CD4 + helper cell called Th3 (T reg), will secrete TGF-β that will help the specific B cell differentiation antigen for IgA isotype switching into IgA producing plasma blast. After experiencing maturation in mesenteric

lymph nodes, and through the circulation of lymph and blood circulation T cells and B cells (in the form of immunoglobulin producing plasma cell) will be returned to the mucosal effector sites. Here there is a process of differentiation end, and with the help of IL-4, IL-5, IL-6, IL-10, TGF-β, B cells will be producing plasma cell immunoglobulin that will produce IgA in the intestinal mucosa (Bauer, 2005; Bland 2006; Chorthesy, 2007; Galdeano; 2007).

Administration of LPS in this study may be a factor specific antigen causing the mice able to produce cell expression of IgA. The existence of IgA prove that probiotics also may play a role in the adaptive immune response. The adaptive immune response is done probiotics to modulate immune responses in mucosal, probiotic bacteria approached to communicate (cross-talk) with host immune cells, to help identify the receptor or recognize the product of probiotics such as metabolites of products, components of cell walls and DNA (Corthesy 2007). Antigen presentation of the flora in the intestinal lumen causing the formation of local immunoglobulin-producing cells without induction of a systemic immune. Local immune response in the intestinal mucosa caused by the interaction between probiotic bacteria, epithelial and immune cells to join the lamina propria. There are 3 interaction of cells of the intestine in generating an immune response, namely: through cell M in Peyer's patches, presentation as well as the process of entry of the antigen to cell epithelial, and interaction with cell epithelial well as the elimination of the antigen through the portal circulation or induction of local immune response with activation of cytokines. Besides the important factor of local defense system involving cell migration of specific B cells and T cells of Peyer's patches, (Bouvet, 1999; Collins, 1999; Bland, 2006

After going through the process transitosis, IgA and IgM will bind with *J chain* and *secretory component*; which later became sIgA and sIgM. Especially immunoglobulin IgA regulatory process involves several cytokines. According Perdigon (2002) *J chain* production by B cells also involves cytokines such as IL-2, IL-5 and IL-6. To avoid excessive inflammatory process of the activity of cytokines, are down-regulated mechanism that is played by TGF-□, IL-4 and IL-10 (Perdigon, 2002; Goldeano, 2007).

Conclusion

Giving probiotic Lactobacillus plantarum IS-10 506 white rats Rattus norvegicus Wistar strain healthy elderly differed significantly against IL-6 ($p < 0.05$), did not differ significantly against IgA ($p > 0.05$), but still in a state of homeostasis. Giving probiotic Lactobacillus plantarum IS-10 506 white rats Rattus norvegicus Wistar strain of elderly who gets exposure lipopolysaccharide provide benefits in the immune response significantly, increasing the expression of the immune response markers IL-6, IgA.

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