Proceeding of
International Joint Symposium
Frontier In Biomedical Sciences: From Genes to Applications

November 24 and 25, 2008

Faculty of Medicine
Gadjah Mada University
Yogyakarta, Indonesia

UNIVERSITI SAINS MALAYSIA

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ISBN 978-979-3177-70-0

Proceeding of International Joint Symposium 2008

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ISBN: 978-979-3177-70-0

Published by
Faculty of Medicine
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Short Communication

The Effect of *Morinda Citrifolia Linn* Extract on Blood MDA level and Catalase Activity in Aloxan-Induced Diabetic Rat

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Introduction

Diabetes mellitus (DM) is a degenerative disease characterized by chronic hyperglycemia with increasing number of patient annually. Chronic hyperglycemia lead to increase oxydative stress which finally causes lipid peroxidation. At the end of the reaction, toxic compounds to cell such as malondialdehyde (MDA), ethane and pentana were produced. To prevent the negative effect of oxidative stress, antioxidant is required. *Morinda citrifolia linn* is one of herbal medicine crop containing antioxidant active agent commonly used by local people in West Sumatra. The effect of *M. citrifolia linn* on blood MDA level and catalase activity in alloxan-induced diabetic rat.

Methods

This was experimental research design using rat as subjects, carried out at Biochemistry Laboratory of Medical Faculty, Pharmacology and Natural Chemical Substance Laboratories of Mathematic and Natural Science Faculty of Andalas University, Padang, West Sumatra. Subjects were twelve white rat selected at random with body weight range from 200-250 grams, divided into three groups. Negative control group was normal rat, positive control group was alloxan-induced diabetic rat without supplementation, treatment group was alloxan-induced diabetic rat received extract of *M. citrifolia linn* 500 mg/kg.bw/day for 12 days.

Fasting blood glucose level was determined by using glucosemeter (Gluco-DR). Blood MDA level was determined using thio barbituric acid (TBA) method and catalase activity was determined using colorimetric method. Blood was taken from rat tail.

Data Analysis

Data analyzed with Anova using SPSS version 15.0. If there were significant difference between groups (p<0,05), analysis was continued with Post Hoc Test Multiple Comparison (Tukey HSD).

Result

The level of MDA in three group shown in Table 1. Supplementation of *M. citrifolia linn* extract reduced the level of MDA so the level was lower compare with that of positive control (p = 0.003). Post Hoc Test Multiple Comparison (Tukey HSD) showed that the difference of blood MDA level was significant between treatment group and negative and positive control group.

Tabel 1. Difference level of blood MDA (nmol/ml) in three group of research.

No	Negative Control	Positive Control	Treatment	P Value
1	3.77	5.265	4.127	
2	4.038	6.112	5.042	
3	4.594	5.332	4.662	0.003
4	4.64	5.71	4.885	
Average	4.216	5.605	4.679	
SD	0.427	0.391	0.4	

The catalase activity of three groups were shown in Table 2. There was significant difference of catalase activity these group, treatment group have the highest activity whereas control negative group has the lowest. Post Hoc Test Multiple Comparison (Tukey HSD) showed differences between control negative group with that of control positive group (p< 0.05) and control positive group with treatment group (p<0.03).

Tabel 2. Difference of catalase activity (unit/mg) in the three group of research.

No	Negative Control	Positive Control	Treatment	P Value
1	6.331	5.551	6.453	
2	6.951	4.625	5.367	
3	6.412	5.138	6.843	0.003
4	6.625	4.5	6.594	
Average	6.58	4.954	6.314	
SD	0.277	0.485	0.651	

Discussion

The average MDA blood level of negative control group has the lowest blood MDA level because at this group rat has not received any treatment. The average of blood MDA level of positive control is highest because this group received alloxan which induced the breakdown of beta cell of pancreas.

Treatment group have average MDA blood level significantly lower than that of positive control group. It indicate that by giving of *M. citrifolia linn* extract (500 mg/kg.bw/day) orally at DM rats for 12 day can reduce MDA blood level significantly. Since MDA is the end product of and a marker of oxidative stress, decrease level of MDA may represent equilibrium state between oxidant and antioxidant system.

The average of catalase activity group of negative control is normal because in this group rats has nor received treatment. The positive control group has the lowest catalase activity compared with that of two other groups because the damage pancreas beta cell result in higher blood glucose level which induced free radical production lead to lower level of antioxidant enzymes such as catalase, super oxide dismustase (SOD), and glutation peroxides (Gpx). The treatment troup has the highest average of catalase

activity (p<0,05), probably due to the effect *M. citrifolia linn* extract which act as antioxidant. *M. citrifolia linn* extract contains various active substance playing important role for antioxidant, that are vitamin A, vitamin C, selenium and Fe.

Conclusion

M. citrifolia linn extract reduced blood MDA level and increased catalase activity in alloxan-induced diabetic rat.

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INTERNATIONAL JOINT SYMPOSIUM
FRONTIER IN BIOMEDICAL SCIENCES: FROM GENES TO APPLICATIONS

Secretariat: Molecular Biology Laboratory Faculty of Medicine Gadjah Mada University
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No : UGM/KU/KOM.KAGAMA/ 326 /IV/10
Lamp :
Perihal : Pengantar Proceeding International Joint Symposium

Yogyakarta, 15 April 2010

Kepada Yth :

Dr. Yerizel

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Dengan hormat,

Dalam rangka Dies Natalis Universitas Gadjah Mada yang ke 59 telah diselenggarakan *International Joint Symposium* pada tanggal 24-25 November 2008 yang bertempat di Fakultas Kedokteran UGM dengan tema "*Frontier in Biomedical Sciences: From Genes to Applications* ". Seminar ini merupakan kegiatan bersama antara Universitas Gadjah Mada, Nara Institute Science and Technology (NAIST) Jepang dan Universiti Sains Malaysia (USM).

Maka bersama dengan surat ini kami sertakan juga buku proceeding kegiatan tersebut dengan No. ISBN 978-979-3177-70-0. Semoga buku proceeding ini dapat bermanfaat dan berguna bukan hanya bagi penulis namun siapa saja yang membacanya.

Mohon maaf atas keterlambatan pengiriman buku proceeding ini.

Atas perhatiaan dan kerjasamanya kami ucapkan terima kasih.

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