

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/297019866>

The corelation of herbs consumption and liver enzyme activities of healthy subjects in Yogyakarta

Conference Paper · September 2015

CITATIONS

0

READS

4

1 author:



Akrom Akrom

Ahmad Dahlan University

29 PUBLICATIONS 7 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Development of Nigella sativa oil as immunomodulator and antioxidant for metabolic syndroms patients [View project](#)



Nigella sativa as chemopreventive and immunomodulator [View project](#)

The Abstracts Book of International conference medical and health science

ISBN

The Correlation of Herbs Consumption and Liver Enzyme Activities of Healthy Subjects in Yogyakarta

Oktaviyanti N¹, Akrom², Darmawan E³

1. Postgraduate Program of Clinical Pharmacy of Ahmad Dahlan University of Yogyakarta

Jl. Prof. Dr. Soepomo, Telp. (0274) 379418; Email: nurliaokta@gmail.com

2. Head of Pharmacology and Clinical Pharmacy Department, Pharmacy Faculty & Head Of Drug Information and Crisis Center, Ahmad Dahlan University

3. Pharmacology and Clinical Pharmacy Departement, Pharmacy Faculty, Ahmad Dahlan University

Abstract:

Introduction: All types of drugs definitely have side effects. Both synthetic drugs or traditional drugs. One of the side effect is liver dysfunction. Liver is the largest organ in the body which has a variety of functions to sustain the survival of most organs in the body. Hepatic dysfunction demonstrated by the increased activity of the ALT and AST enzyme. A study of toxicity of herbal medicine is necessary to protect the people from possible adverse effects. Toxic effects of drugs often occurs in the liver, because the liver is the main place to metabolize all the drugs and foreign substances that enter the body. Liver will change the structure of lipophilic drugs become hydrophilic so easily removed from the body through urine or bile. Excretion through bile allow the accumulation of xenobiotics in the liver that will cause hepatotoxic effects.

Aim: To determine the correlation of herbs consumption and liver enzyme activities of healthy subjects in Yogyakarta

Methodology: We used a crosssectional study design. A total of 44 healthy subject (11 male and 33 female) who live in Yogyakarta. The inclusion criteria were aged 18-60 years old and willing to be a subject (fill the informed consent). This study was approved by the Ethical Committee of Ahmad Dahlan University and informed consent was obtained from all subjects. Serum ALT/AST activities were assayed with an automatic chemical analyzer. The Results of the study will be presented in the form of descriptive and statistical tests performed on 95% confidence level.

Results and discussion : The results showed the AST level was $17,21 \pm 3.62$ U/L while the ALT level $14,58 \pm 7.08$ U/L. The analysis of based on sex showed that the mean (\pm SD) AST and ALT levels of male subject (18.30 ± 4.68 U/L and 20.34 ± 7.50 U/L) higher than female subject (16.84 ± 3.20 U/L and 12.66 ± 5.88 U/L). This study was appropriate with the normal levels of AST and ALT, where male are is higher than female. The normal male values ≤ 40 U/L for AST and ≤ 41 U/L for ALT. The normal female values ≤ 32 U/L for AST and ≤ 33 U/L for ALT. Analysis of AST and ALT activities based on consumption herbs shows that the mean activities (\pm SD) of serum AST of subject consumed herbs higher than subject did not its. Serum activities of AST in subject consumed herbs averaged 17.90 ± 2.88 U/L, which were higher than in subject did not consumed herbs (16.98 ± 3.82 U/L). However, based on Independent Sample t-test statistical analysis obtained by p value = 0.381 ($p > 0.05$), there is no significant difference between ALT activity in subject consumed herbs and subject did not consumed herbs. Same results were obtained in ALT activity where serum activities of ALT in subject consumed herbs averaged 16.98 ± 8.91 U/L, which were higher than in subject did not consume herbs (13.87 ± 6.43 U/L). However, based on Independent Sample t-test statistical analysis obtained by p value = 0.326 ($p > 0.05$), which means there is no significant difference between ALT activity in subject consume herbs and subject did not consumed herbs. However, the mean levels of ALT and AST are still in the normal range.

Conclusions: The activities of AST and ALT in male is higher than female. There is no correlation between the AST -ALT activities and herbal medicine consumption in healthy subjects..

Keywords: Herbs, Liver Enzim, AST,ALT

The Abstracts Book of International conference medical and health science

ISBN

1. INTRODUCTION

Herbal medicine is the Indonesian nation's cultural heritage is inherited from generation to generation. Although more modern times, the consumption of herbal medicine among the people of Indonesia have never given up. According to data of Health Research (Riskedas) in 2010, 55.3% of Indonesia's population to consume herbs and 95% claimed beneficial herbs for health. The use of chemical drugs or traditional medicine for the treatment can cause side effects on the body.

The use of new drugs in humans will lead to the desired effects and useful in some cases but it is also causing unwanted effects even dangerous and toxic effect (Kusumawati, 2004). One side effect of concern in consuming herbal medicine is impaired liver function. Common liver function tests to detect disturbances in the liver are AST (aspartate transaminase), which in Indonesia is more commonly referred to as SGOT (serum glutamic-oxaloacetic transaminase) and ALT (alanine transaminase) in Indonesia is usually referred to as SGPT (serum glutamic-pyruvic transaminase). Aminotransferase widespread in the body, but especially are often found in the liver, because of the important role of this organ in protein synthesis and in channeling amino acids into the path of another biochemical pathway. Hepatocyte is essentially the only cells with high concentrations of ALT, while the kidneys, heart, and skeletal muscle contain moderate levels. ALT in smaller amounts found in the pancreas, lungs, lymph, and erythrocytes. Hepatic dysfunction demonstrated by the increased activity of the ALT and AST enzyme (Price and Wilson, 2005)

A study of toxicity of herbal medicine is necessary to protect the people from possible adverse effects. Toxic effects of drugs often occurs in the liver, because the liver is the main place to metabolize all the drugs and foreign substances that enter the body. Liver will change the structure of lipophilic drugs become hydrophilic so easily removed from the body through urine or bile (Setiawati et al., 2007). Excretion through bile allow the accumulation of xenobiotics in the liver that will cause hepatotoxic effects (Donatus, 2001).

2. METHODE

We used a crosssectional study design. A total of 44 healthy subject (11 male and 33 female) who live in Yogyakarta. The inclusion criteria were aged 18-60 years old and willing to be a subject (fill the informed consent). This study was approved by the Ethical Committee of Ahmad Dahlan University and informed consent was obtained from all subjects. Serum ALT/AST activities were assayed with an automatic chemical analyzer. The independent variable were age and a history of consumption of herbs while the dependent variable were ALT /AST activities. The Results of the study will be presented in the form of descriptive and Statistical tests performed on 95% confidence level.

3. RESULTS AND DISCUSSION

The study aimed to determine the consumption of herbs correlation with AST and ALT activities of healthy volunteers in yogyakarta. A total of 44 healthy subject (11 male and 33 female). The range of subject aged between 18-60 years old consisting of 37 people aged <25 years and 7 people aged > 25 years. Characteristics of subjects are presented in table 1.

The Abstracts Book of International conference medical and health science

ISBN

Liver is the largest organ in the body which has a variety of functions to sustain the survival of most organs in the body. Hepatic dysfunction demonstrated by the increased activity of the ALT and AST enzyme (Price and Wilson, 2005).

Tabel 1. Characteristics of respondents

| Characteristics of respondents | n | % |
|--------------------------------|-----------|------------|
| Sex | | |
| Male | 11 | 25 |
| Female | 33 | 75 |
| Total | 44 | 100 |
| Age | | |
| <25 years | 36 | 81,81 |
| >25 years | 8 | 18,19 |
| Total | 44 | 100 |
| Educations | | |
| High School | 10 | 22,73 |
| DIII | 1 | 2,27 |
| S1 | 32 | 72,73 |
| S3 | 1 | 2,27 |
| Total | 44 | 100 |
| Work | | |
| Student | 34 | 77,27 |
| Swasta | 7 | 15,91 |
| Wiraswasta | 3 | 6,82 |
| Total | 44 | 100 |

The Liver Enzyme description of In young adults with central obesity showed that the normal range of aminotransferase levels slightly higher in males, ethnicity, and obesity. while the female respondents did not have elevated levels of AST and ALT (Friedly Pondaag, 2014). A little increased levels of ALT and AST (<1.5x) does not always showed liver disease. The results showed the AST level was $17,21 \pm 3,62$ U/L while the ALT level $14,58 \pm 7,08$ U/L. The results AST and ALT activities of Healthy Subjects in Yogyakarta based on sex are presented in Table 2 and 3.

Tabel 2. Distribution of AST levels based on Sex

| Sex | N | AST levels Mean± SD (U/L) | Maximum AST levels (U/L) | Minimum AST levels (U/L) |
|--------|----|------------------------------|-----------------------------|-----------------------------|
| Male | 11 | 18,30± 4,69 | 10,01 | 29,50 |
| Female | 33 | 16,84± 3,20 | 12,20 | 24,70 |

The Abstracts Book of International conference medical and health science

ISBN

Tabel 3. Distribution of ALT levels based on Sex

| Jenis Kelamin | N | ALT levels | Maximum ALT | Minimum ALT |
|---------------|----|----------------|--------------|--------------|
| | | Mean± SD (U/L) | levels (U/L) | levels (U/L) |
| Laki-laki | 11 | 20,34± 7,50 | 12,20 | 34,40 |
| Perempuan | 33 | 12,66± 5,88 | 6,70 | 32,90 |

The analysis of based on sex showed that the mean (±SD) AST and ALT levels of male subject (18.30 ± 4.68 U/L and 20.34 ± 7.50 U/L) higher than female subject (16.84 ± 3.20 U/L and 12.66 ± 5.88 U/L). This study was appropriate with the normal levels of AST and ALT, where male are is higher than female (Jong Wen Choi, 2003). The normal male values ≤ 40U/L for AST and ≤41 U/L for ALT. The normal female values ≤ 32 U/L for AST and ≤33 U/L for ALT (Joice,1997). One of the factors affecting the AST and ALT levels of the hormone estrogen in females. With the high estrogen, disruption of liver function (Guyton, 2007). The contraceptive drugs are known to cause an increase in estrogen in the body. In this study there were no increased levels of ALT and AST in women.

A study of toxicity of herbal medicine is necessary to protect the people from possible adverse effects. Toxic effects of drugs often occurs in the liver, because the liver is the main place to metabolize all the drugs and foreign substances that enter the body. Liver will change the structure of lipophilic drugs become hydrophilic so easily removed from the body through urine or bile (Setiawati et al., 2007). Excretion through bile allow the accumulation of xenobiotics in the liver that will cause hepatotoxic effects (Donatus, 2001).

Tabel 4. Distribution AST levels based on herb consumption

| Umur (Tahun) | N | AST levels | Maximum AST | Minimum AST | p |
|---------------------|----|----------------|--------------|--------------|-------|
| | | Mean± SD (U/L) | levels (U/L) | levels (U/L) | |
| Herb Consumption | 10 | 17,90± 2,88 | 13,20 | 23,20 | 0,381 |
| No Herb Consumption | 34 | 16,98± 3,82 | 10,01 | 29,50 | |

Tabel 5. Distribution ALT levels based on herb consumption

| Umur (Tahun) | N | ALT levels | Maximum ALT | Minimum ALT | p |
|---------------------|----|----------------|--------------|--------------|-------|
| | | Mean± SD (U/L) | levels (U/L) | levels (U/L) | |
| Herb Consumption | 10 | 16,98± 8,91 | 7,10 | 32,90 | 0,326 |
| No Herb Consumption | 34 | 13,87±6,43 | 6,70 | 34,40 | |

Table 4 and 5 shows that correlation of herbs consumption and liver enzyme activities of healthy subjects in Yogyakarta. There were no significant difference AST activity between in subject consumed herbs and subject did not consume herbs (p value = 0.381 (p> 0.05). However, serum activities of AST in subject consumed herbs averaged 17.90 ± 2.88 U/L, which were higher than in subject did not consume herbs (16.98 ± 3.82 U/L). Same results were obtained in ALT activity where serum activities of ALT in subject consumed herbs averaged 16.98 ± 8.91 U/L, which were higher than in subject did not consume herbs (13.87 ± 6.43 U/L). However, based on Independent Sample t-test statistical analysis obtained by pvalue = 0.326 (p> 0.05), which means there is no

The Abstracts Book of International conference medical and health science

ISBN

significant difference between ALT activity in subject consumed herbs and subject did not consume herbs. However, the mean levels of ALT and AST are still in the normal range.

Medicinal herbs or drugs that are toxic to the cells of the liver (hepatotoxicity) can be interfere with liver function. Liver function disorders indicated by the increase in enzyme AST (serum glutamic oxaloacetic transaminase) and ALT (serum glutamic pyruvic transaminase). AST dan ALT enzymes are sensitive to the serum transaminase damage liver cells. An increase of twice or more than normal levels of AST and ALT enzyme is a sure sign of disturbance of liver cells. (Mc.Gilvery, and Golstein, 2006). In this study, there was no increase in AST and ALT enzymes in subject consumed herbs.

4. CONCLUSIONS

The activities of AST and ALT in male is higher than female. There is no correlation between the AST - ALT activities and herbs consumption in healthy subjects..

5. ACKNOWLEDGEMENT

Thanks to volunteer to their participation in this study, Mr. Dr.dr.Akrom, M.Kes and Dr.rer.nat.Endang Darmawan, M.Si.,Apt for their advice, encouragement and support in the completion of this study.

6. REFERENCES

- Badan Litbang Kesehatan, 2010, Laporan Riskesdas, Jakarta.
- Donatus IO. Toksikologi dasar. (2001). Yogyakarta: *Laboratorium Farmakologi dan Toksikologi Fakultas Farmasi Universitas Gadjah Mada*; 100-2.
- Friedly Pondaag, et al, 2014, Gambaran Enzim Hati Pada Dewasa Muda Dengan Obesitas Sentral, *Skripsi*, Fakultas Kedokteran Universitas Sam Ratulangi Manado
- Guyton AC, Hall JE. *Buku Ajar Fisiologi Kedokteran* edisi 11. EGC. Jakarta. 2007. hal 917,1070
- Jong Weon Choi, 2003. Association Between Elevated Serum Hepatic Enzyme Activity and Total Body Fat in Obese Humans, Department of Laboratory Medicine, College of Medicine, Inha University, Inchon, South Korea, *Jurnal e-CliniC (eCI)*, Volume 2, Nomor 2, Juli 2014
- Joyce. L, 1997. *Pemeriksaan Laboratorium dan Diagnostik*. EGC : Jakarta
- Kusumawati, Diah. 2004. *Buku Ajar Hewan Coba*. Gajah Mada University
- Mc.Gilvery, R.W.and Golstein, G.W., 2006, *Biokimia Suatu Pendekatan Fungsional*, Edisi ketiga, Airlangga University Press, Jakarta
- Press. Yogyakarta. Guyton AC, Hall JE. *Buku Ajar Fisiologi Kedokteran edisi 11*. EGC. Jakarta. 2007. hal 917,1070
- Price, S.A., Wilson, L.M., 2005. *Patofisiologi Konsep Klinis Proses-Proses Penyakit*, diterjemahkan oleh Brahm, U., Huriawati, H., Pita, W., Dewi, A.M., E.G.C., Edisi 6 Vol.6, hal 475-479, Jakarta.
- Sacher, Ronald A. dan McPherson, Richard A. 2002. *Tinjauan Klinis Hasil Pemeriksaan Laboratorium Edisi 11*. Penerbit Buku Kedokteran EGC. Jakarta.
- Setiawati A, Suyatna FD, Gan S. (2007). *Pengantar farmakologi*. In: Gunawan SG, Setiabudy R, Nafrialdi, Elysbeth. *Farmakologi dan terapi*. 5th ed. Jakarta: Departemen Farmakologi dan Terapeutik Fakultas Kedokteran Universitas Indonesia; 1-11.