

**CLINICAL STUDY OF TURMERIC AND GARLIC
EXTRACTS COMBINATION AS ANTIDIABETIC
AGENT IN TYPE-2 DIABETIC-DYSLIPIDEMIC
SUBJECTS**

Researchers:

Prof. Dr. Elin Yulinah

Dr. Joseph I Sigit

dr. Hikmat Permana, SpPD KEMD

Patonah, MSi., Apt

Dewi Mardiyah, MSi., Apt.

Research Group:

School of Pharmacy

ITB

Background

- High Prevelence of type-2 diabetes
 - Diabetic Patients complication with dyslipidemia 20-60 %
 - Diabetes and dyslipidemia known as risk factors for CVD
 - Long term therapy , the use of natural product as an alternative or complement
 - Garlic (*Allium sativum* Lin.) and turmeric (*Curcuma domestica* Val.) known as traditional drugs for several diseases → diabetes mellitus and dyslipidemia
-

Preclinical Study

- ❑ Extracts combination of garlic and turmeric have significant effect in lowering blood glucose level in diabetic-hypercholesterolemic animal model (Deviana, 2005; Fadlina, 2005)
 - ❑ Toxicity test showed that LD50 of extracts combination is > 15 g /kg BW (practically not toxic) and had no effect on liver and kidney functions (Subiakto, 2005).
-

Objectives

- ❑ To evaluate effectivity and safety of garlic and turmeric extracts combination as antidiabetes in type-2 diabetic-dyslipidemic subjects.
-

Design Study

- Approved by ethical committee of Hasan Sadikin Hospital (March 17, 2006).
 - Randomized, parallel and double blind study.
 - 12 weeks treatment
 - Research was done at Hasan Sadikin Hospital Bandung during April 2006 – September 2007.
-

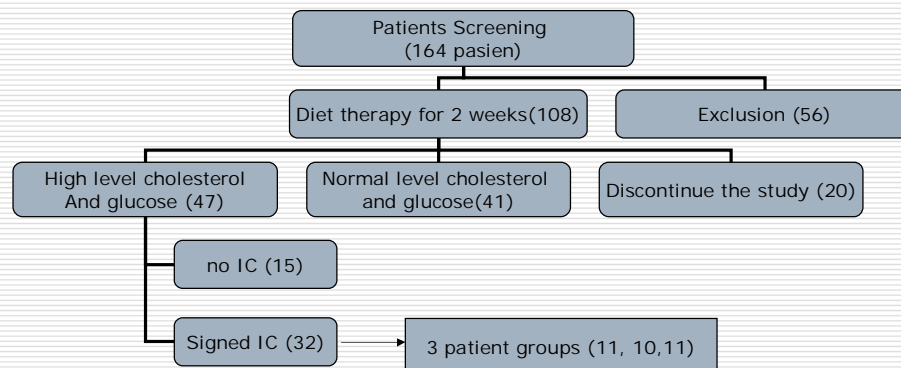
Inclusion criteria

- Type-2 diabetic–dyslipidemic patients.
 - Never been treated with glucose-lowering drug or insulin and cholesterol-lowering drug.
 - Men or women > 35 years old.
 - Agree to sign the informed consent.
-

Exclusion criteria

- DM type 1
- Kidney or liver failure
- Using steroid hormon or contraseption drug
- Ketoacidosis complication
- Ulcus diabetic
- CHD
- Pregnant or breastfeeding women.

Research lay out



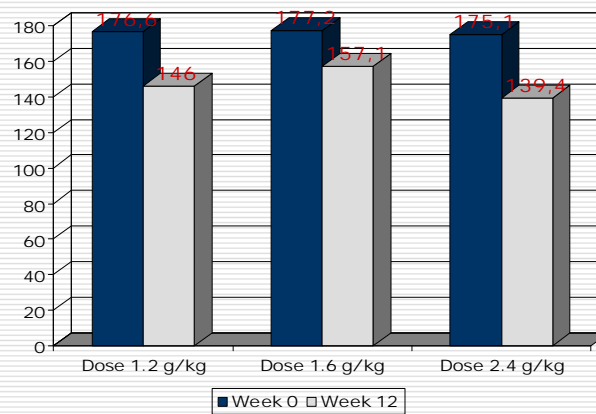
Results

Baseline characteristics	Dose 1.2 g/kg (n=11)	Dose 1.6 g/kg (n=10)	Dose 2.4 g/kg (n=11)
Sex			
- Men	1	1	3
- women	10	9	8
Age (years)	59.29 ± 6.82	54.44 ± 4.36	54.50 ± 8.40
Fasting glucose (mg/dl)	177.64 ± 52.13	177.20 ± 45.04	175.09 ± 51.03
2 hrs pp glucose (mg/dL)	235.80 ± 87.96	249.44 ± 65.55	266.27 ± 60.06
Insulin (uIU/ml)*	8.36 ± 4.73	11.07 ± 8.64	3.90 ± 1.62
HbA1C (%)**	10.06 ± 3.04	9.60 ± 1.69	11.48 ± 1.47
Total cholesterol (mg/dL)	229.09 ± 33.77	228.50 ± 44.67	217.45 ± 38.20
LDL (mg/dL)	148.91 ± 28.19	148.20 ± 38.13	137.82 ± 38.58
HDL (mg/dL)	48.00 ± 10.74	48.00 ± 7.50	46.45 ± 9.07
Triglyceride (mg/dL)	161.00 ± 96.14	161.70 ± 59.80	165.73 ± 58.20
BMI (kg/m ²)	25.53 ± 3.26	27.59 ± 4.83	29.17 ± 3.46

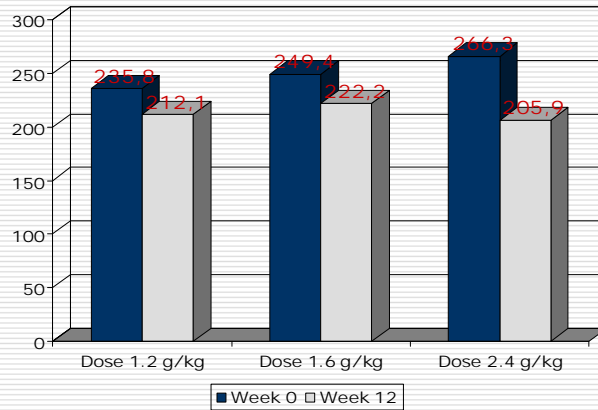
* n= 5,3,5 (group A, B,C)

**n= 7,9,7 (group A, B, C)

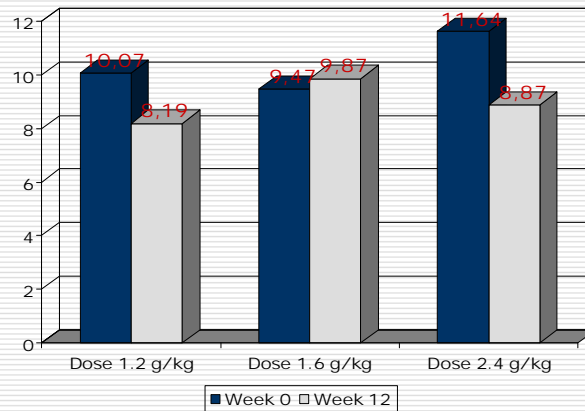
Fasting glucose level



Post prandial glucose level



HbA1C



BMI (Body Mass Index)

Weeks	Dose 1.2 g/kg Average BMI (SD)	Dose 1.6 g/kg Average BMI (SD)	Dose 2.4 kg/g Average BMI (SD)
M0	25.53 (3.26)	27.5(4.83)	29.17 (3.46)
M2	25.45 (3.10)	27.47 (4.82)	28.03 (4.59)
M4	24.95 (3.26)	27.22 (4.71)	28.45 (3.18)
M6	25.12 (3.46)	26.96 (4.81)	28.07 (3.28)
M8	25.08 (3.15)	26.76 (4.81)	28.07 (3.58)
M10	24.86 (3.21)	26.87 (4.62)	28.00 (3.58)
M12	24.86 (3.21)	26.77 (4.52)	27.93 (3.56)

bold = significant (p<0.05)

Clinical outcomes (improvements) based on patient assessments

- Eyesight
- Sexual
- Appetite
- Stamina
- Quality of sleep
- Blood pressure

Safety Profile

- No serious adverse events
 - SGOT, SGPT, ureum, kreatinin, and hematologi profile in 3 months within normal limit.
-

Conclusion

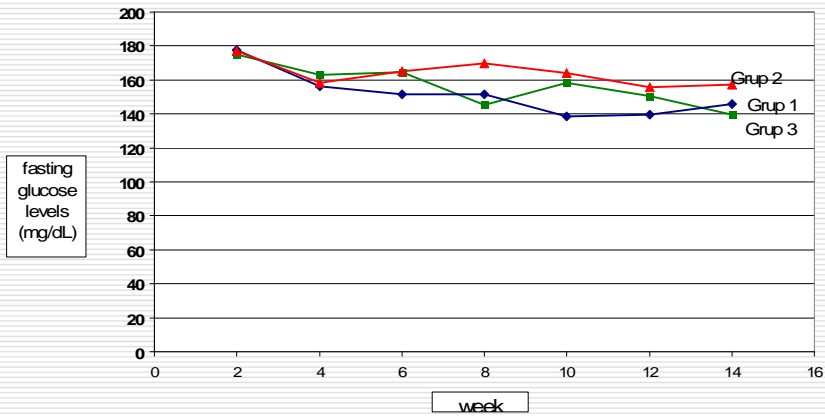
- Lower glucose level and HbA1c.
 - Clinical outcomes improvement
 - Liver and kidney function parameters and hematology profile within normal limit.
 - Tolerable and good safety profile
-

Special thanks

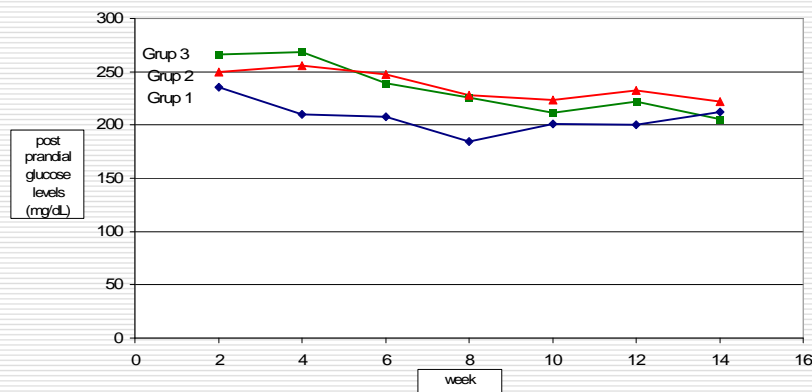
Innogene Kalbiotech Pte. Ltd.
Jakarta, Indonesia

thank you

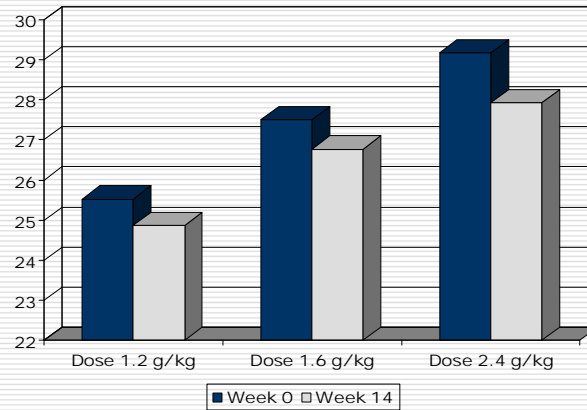
Fasting glucose level



Post prandial glucose level



BMI



HbA1c and Insulin levels

Observation	Laboratory Value				p
	before treatment X (SD)	After treatment X (SD)	Different X (SD)	% Different	
HbA1C (%)					
Group A (n7)	10.07 (3.03)	8.19 (2.69)	1.89 (2.53)	18,77	0.1
group B (n9)	9.47(1.85)	9.87 (2.07)	0,40 (1,51)	4,22	0.45
group C (n7)	11.64 (2,37)	8.87 (1.67)	2,77 (2,48)	23,80	0.03
Insulin (µIU/ml)					
group A (n=5)	8.36 (4.23)	4.70 (3.11)	3.66 (4.95)	43,77	0.13
group B (n=3)	11,07 (8,64)	7.77 (7,39)	3,30 (1,25)	28,21	0.05
group C (n=5)	3.90 (1,62)	3.8 (1,51)	0,10 (2,47)	2,56	0,93

Bold = significant (p < 0.05)