

Cinnamon Improves Glucose and Lipids of People with type 2 DM

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Khan A, Safdar M, Ali Khan MM, Khattak KN, Anderson RA. Cinnamon improves glucose and lipids of people with type 2 diabetes. *Diabetes Care*. 2003 Dec;26(12):3215-8.



Background

- Spices such as cinnamon, cloves, bay leaves, and tumeric have in-vitro insulin enhancing activity
- Aqueous cinnamon extract enhances glucose uptake and glycogen synthesis in vitro
- Insulin factors into lipid regulation
- Postulate that cinnamon would improve glucose and lipids in diabetics

Patients

- Type 2 DM
 - Fasting glucose 140-200
- No insulin therapy
- No other medication
- 30 men, 30 women

Patient characteristics

	Cinnamon	Placebo
Age	52.0 ± 5.9	52.0 ± 6.9
Duration of DM	7.10 ± 3.29	6.73 ± 2.32
M/F	15/15	15/15

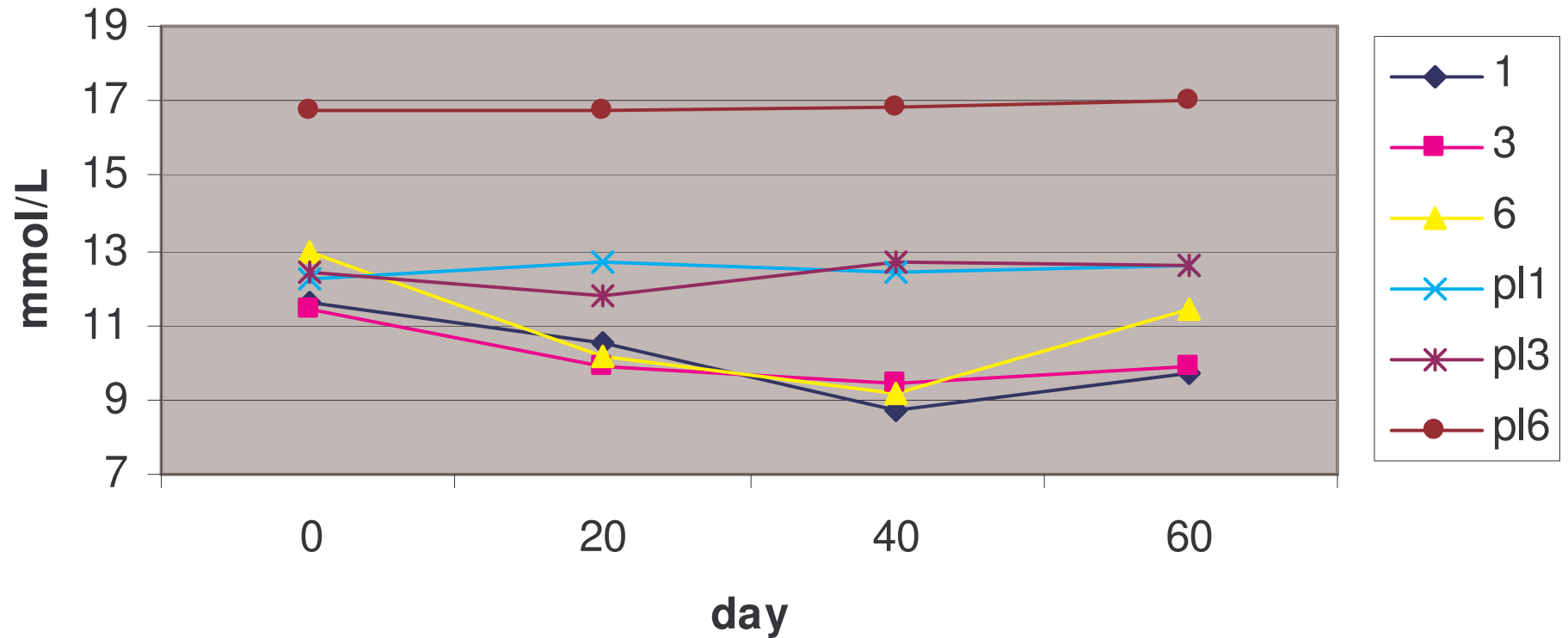
Study Design

- 1 capsule = 500mg of cinnamon or wheat flour
- Subjects randomized to 1 of 6 groups
 - 1, 3, 6g cinnamon/day or placebo
- Followed prospectively for 20 + 20 days, followed by washout of additional 20 days
- Close monitoring, 'all capsules consumed'
- Capsules taken after meals

Measurements

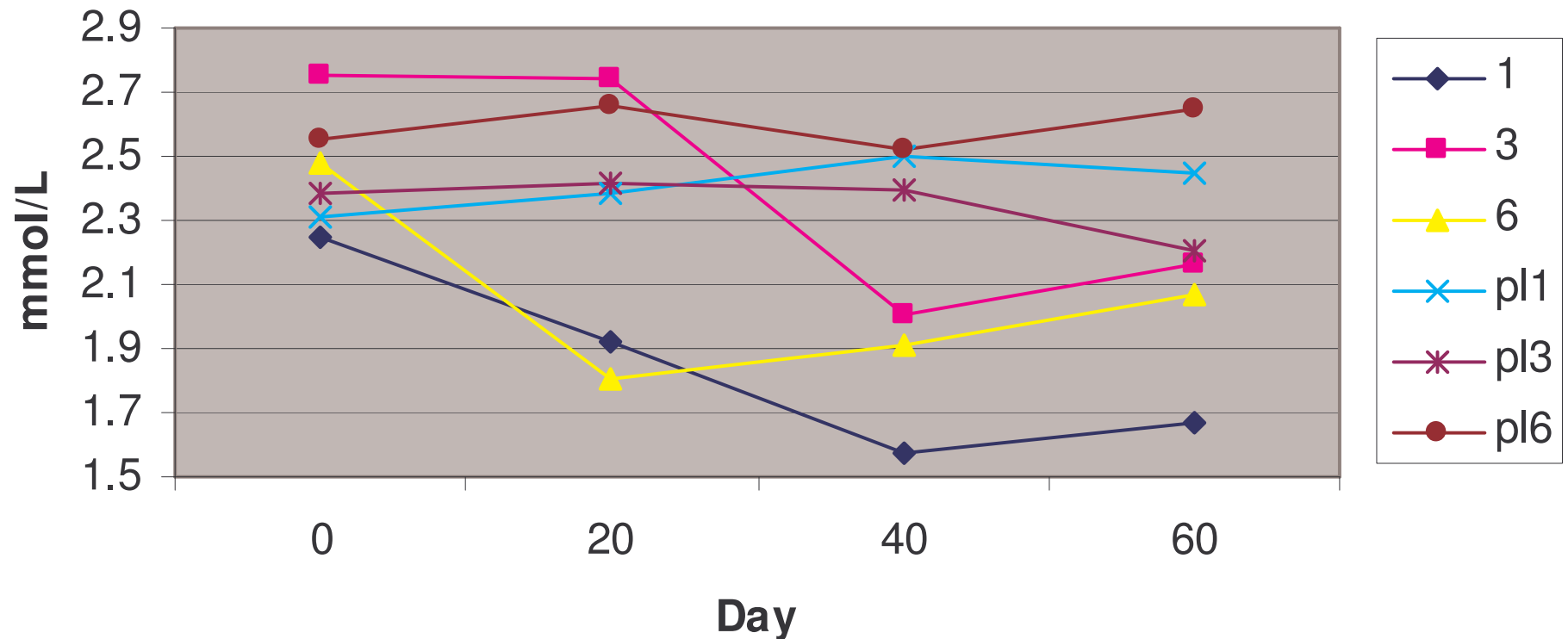
- Blood samples drawn on day 0, 20, 40, 60
- Glucose
- Cholesterol/LDL
- Triglycerides

Glucose



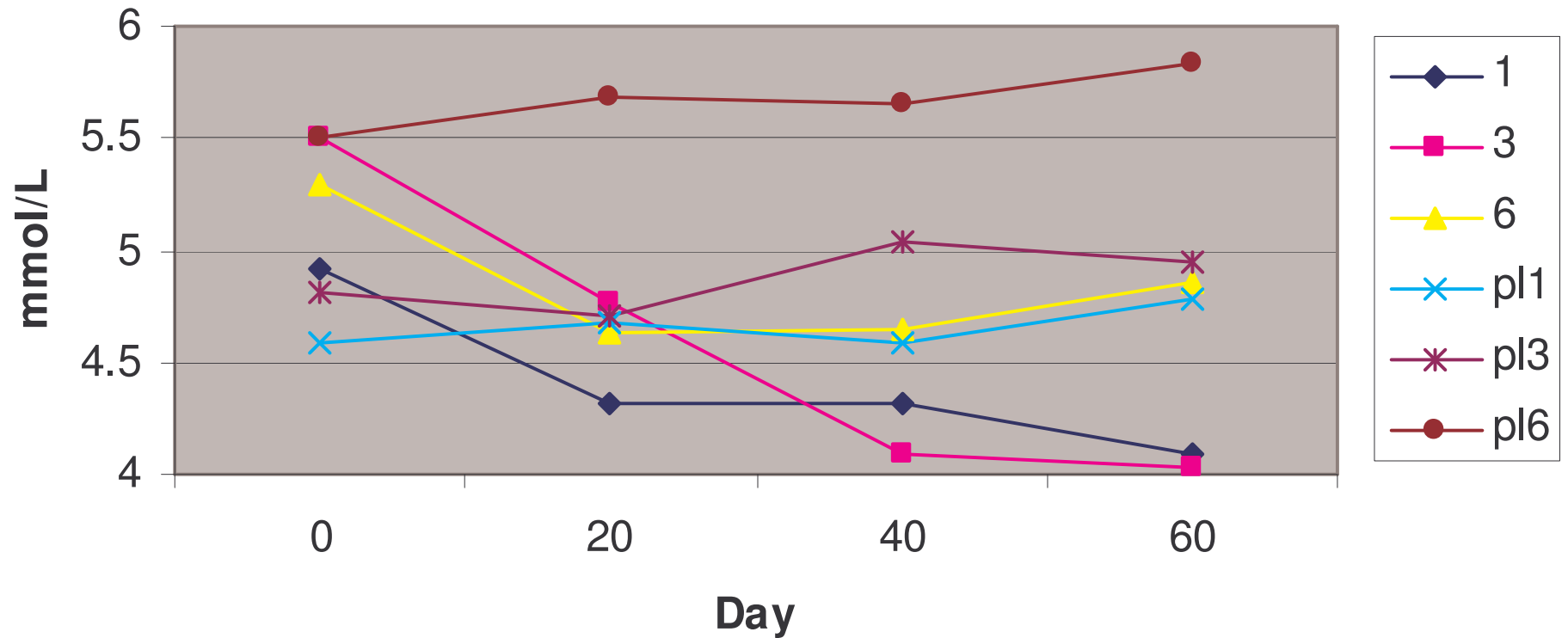
- No dose response noted
- No difference in placebo groups
- At day 60 only 1g/day group had significantly lower glucose

Triglycerides



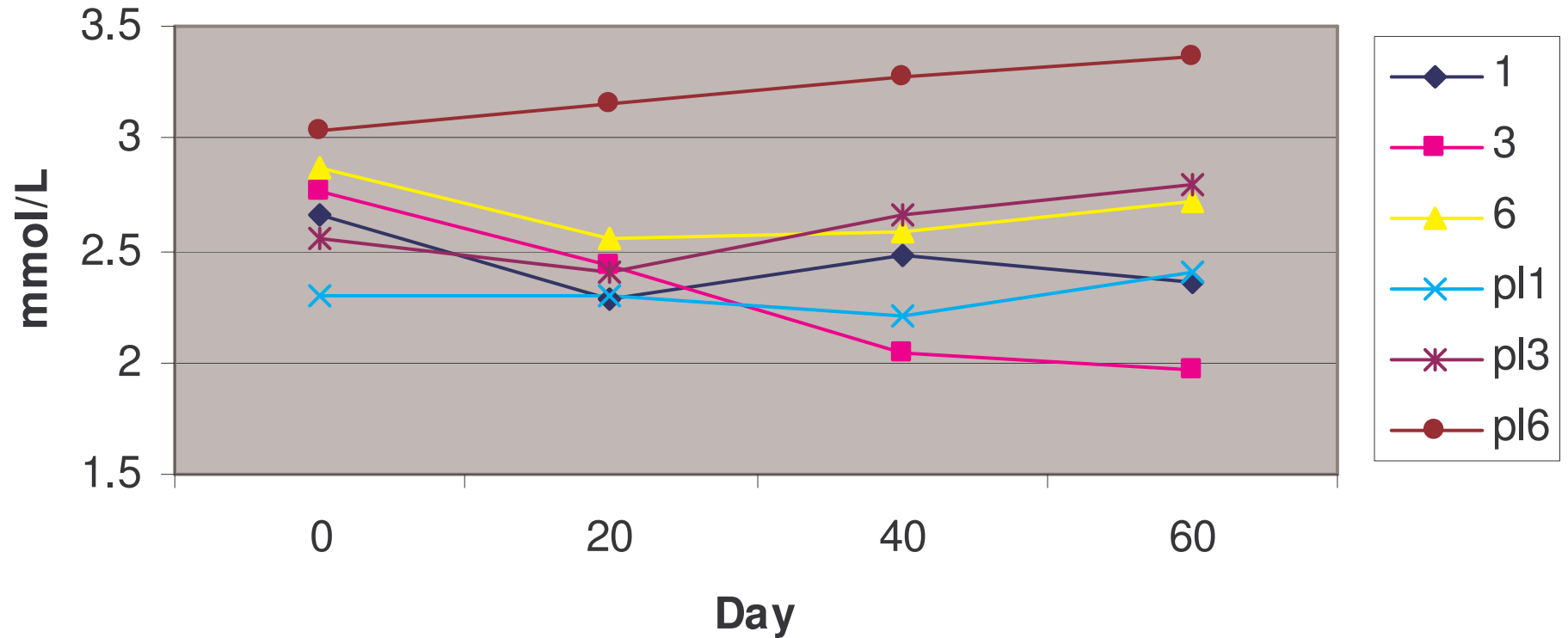
- Significantly lower at day 20 only in 6g/day group
- Lower in all cinnamon groups at day 40
- Maintained significance at day 60
- No significant changes in placebo groups

Cholesterol



- No changes in placebo groups
- Significant decrease in all groups at day 20
- Maintained significance at day 60

LDL



- Significant decreases in 3 and 6g/day groups at day 40
- 1g/day group significant at day 60

Conclusions

- Low doses of cinnamon beneficial to reduce glucose, triglyceride, cholesterol, LDL in patients with DM 2
- No side effects noted

Limitations

- Limited sample size
 - Small study, 60 patients
- Strict inclusion criteria
 - Type 2 DM with NO OTHER MEDS

ANOVA

Analysis of variance

- Allows for analysis of independent variable while controlling for other independent variables
- May perform analysis of several variables while maintaining a constant α error level
 - No need for Bonferroni correction
- Typical use is for nominal independent variables with continuous dependent variables
 - Adaptation can convert continuous independent variables into categories

ANOVA

- General Omnibus Null Hypothesis
 - No difference among groups
- One way ANOVA tests if single independent variable groups are different from each other
 - Systolic BP among White, Black, Hispanic
 - Multiple comparison procedure must be done to identify which group is different
- Two way ANOVA / Factorial ANOVA breaks down groups into other factors; able to analyze more than one independent variable
 - Gender: SBP among Black Men, Black Women, White Men, White Women, etc
 - Can identify interactions
 - Eg Hispanic and Male has different SBP

Why I chose this study

- Translation of basic science to clinical practice
- Easy reading – only 4 pages!
- Good study design
 - Randomized, controlled, prospective trial with washout
- Serves as a pilot study
- ANOVA is a common test
- This is the type of study that can be done at GSH/VA