Výživa a demencia

MUDr. František Cibulčík, CSc.

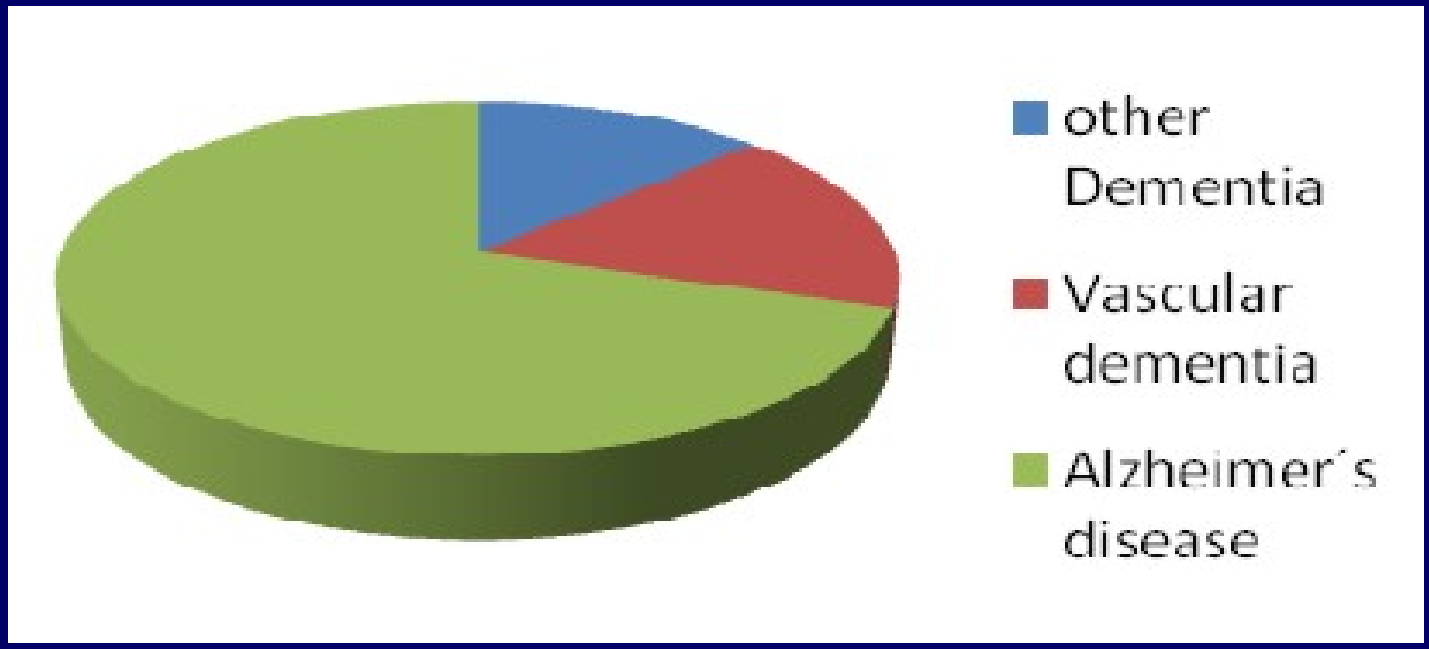
Definícia demencie

- *Syndróm spôsobený ochorením mozgu, väčšinou chronicky progresívneho charakteru, pri ktorom je prítomné poškodenie viacerých vyšších kôrových funkcií ako sú pamäť, myslenie, orientácia, porozumenie, počítanie, učenie, reč a úsudok. Vedomie nie je postihnuté, kognitívne poruchy sú často sprevádzané alebo ich predchádzajú poruchy emócií, sociálneho správania či motivácie*

Výskyt demencie

- 4% vo veku 65 – 74 rokov
- 11% vo veku 75 – 84 rokov
- 35% vo veku viac ako 85 rokov

Výskyt demencií podľa typu



Alzheimer's and Diet: Good for Heart May Be Good for Brain

medpageTODAY

By TODD NEALE
MedPage Today Staff Writer
April 13, 2010

A diet rich in fruits and vegetables as well as omega-3 fatty acids may not only be good for your heart -- it may also reduce the risk of developing Alzheimer's disease.

Little evidence that diet, lifestyle lower Alzheimer's risk

Old age still the most reliable known risk factor for the disease, report finds

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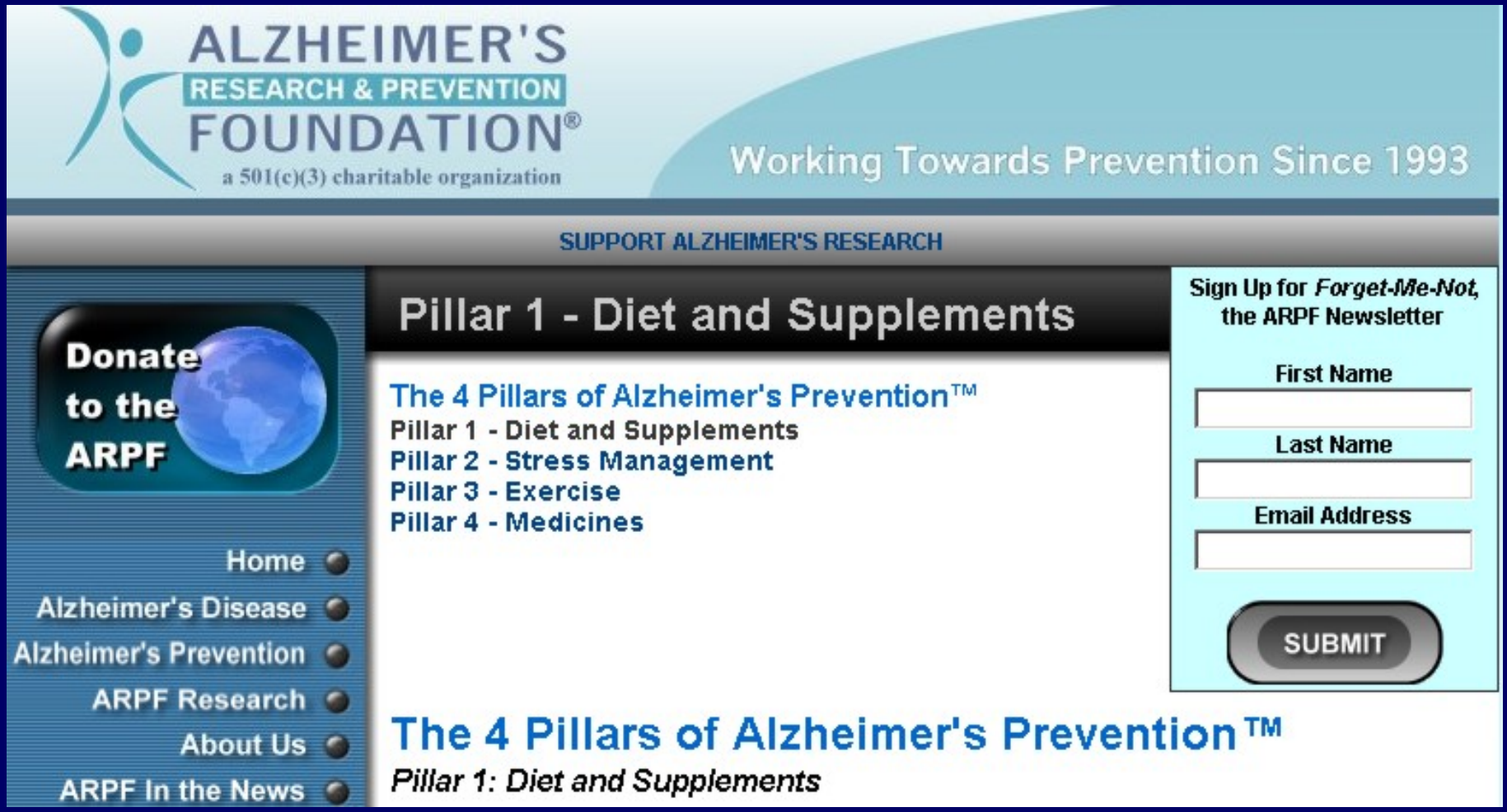
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Be Sure to Take Your Vitamins and Memory-Specific Nutrients

If you're serious about the prevention of memory loss, and improving memory loss, you should *definitely take a high potency multiple vitamin and mineral capsule*. Be sure the vitamin formula you choose contains folic acid and vitamin C. Folic acid reduces homocysteine levels - high homocysteine levels put you at risk for both heart disease and memory loss. Vitamin C has been shown to reduce your risk of Alzheimer's disease by 20% when taken with vitamin E. To take advantage of its fullest benefits, you should take a dose of 2,000 mg of vitamin C per day.

When it comes to memory-specific nutrients, consider including the following in your daily vitamin plan:

- coenzyme Q10
- alpha lipoic acid
- ginkgo biloba
- phosphatidylserine
- DHA (an omega-3 oil)
- acetyl-L-carnitine

Diéta s obsahom rýb

- Kľúčové sú esenciálne 3 – omega – polynenasýtené mastné kyseliny
  - Tvoria 20% tukovej zložky v mozgu, DHA asi 8% hmotnosti sušiny mozgu
  - Organizmus ich nedokáže syntetizovať, ich hladina je preto závislá od príjmu potravou
  - V potrave sú najviac zastúpené
    - Dokózahexaénová kyselina (DHA)
    - Eikózapentaénová kyselina (EPA)
      - Obe sa nachádzajú najmä v rybom oleji a tučných rybách – tuniak, losos
    - Alfa linolénová kyselina (ALA)
      - Nachádza sa v orieškoch, semiačkach, ovocí a zelenine

DHA a demencia

- Plazmatické hladiny omega 3 nenasýtených mastných kyselín sú v inverznom vzťahu ku výskytu kognitívneho poškodenia
- Predpokladaný mechanizmus
  - Zníženie cholesterolu
    - APOE epsilon 4 dôležitý transportér cholesterolu v mozgu a je spojený s vyšším rizikom ACh
  - Protizápalový efekt
    - redukcia prozápalových cytokínov a vplyv na hladinu COX2 a fosfolipázy A2
  - Neuroprotekcia
    - Zvyšovanie koncentrácie fosfatidylserínu

Epidemiologické štúdie

- 10 z 13 epidemiologických štúdií uviedlo inverznú závislosť medzi výskytom Alzheimerovej choroby či kognitívnych porúch a hladinou či príjmom omega 3 nenasýtených mastných kyselín

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Dietary supplementation of arachidonic and docosahexaenoic acids improves cognitive dysfunction

Susumu Kotani [a,b], Eiko Sakaguchi [a], Shogo Warashina [a], Noriyuki Matsukawa [c], Yoshiyuki Ishikura [d], Yoshinobu Kiso [d], Manabu Sakakibara [e], Tanihiro Yoshimoto [f], Jianzhong Guo [g], Tetsumori Yamashima [a,g,*]

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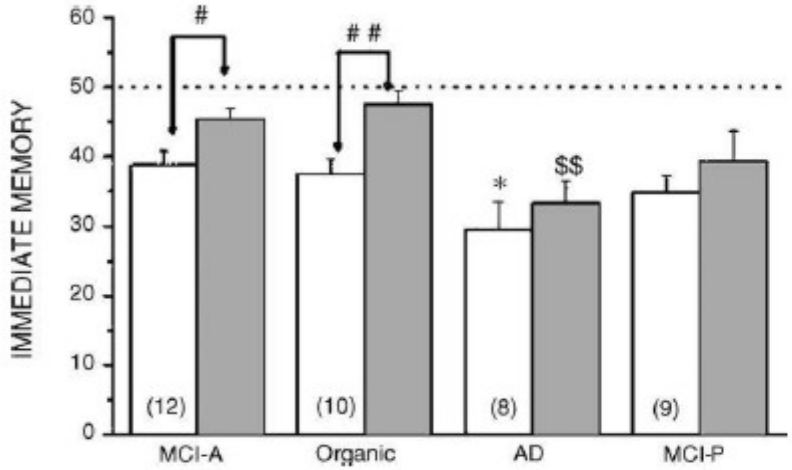

Fig. 3. Comparison of the immediate memory domain between pre- and post-PUFA supplementation in each groups. The AD group showed a significantly lower score compared with the mild cognitive impairment (MCI-A) group before and after the supplementation. Both the MCI-A ($^{\#}p < 0.0$l) and organic brain lesion (organic, $^{\#\#}p < 0.01$) groups showed a significant improvement. MIC-P group showed no significant changes by supplementation. $^{*}p < 0.05$ vs. MCI-A without supplementation, $^{\$\$}p < 0.01$ vs. MCI-A with supplementation. Score of 50 indicates average scores of standard data. Open bars: before supplementation; shaded bars: after supplementation.

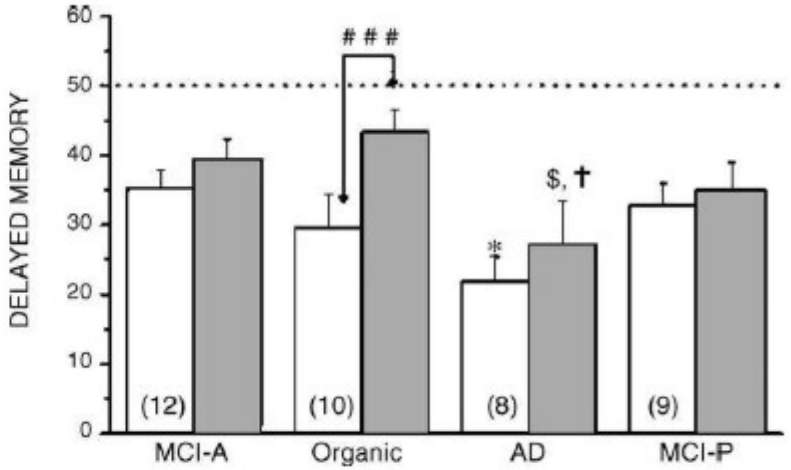

Fig. 5. Comparison of the delayed memory domain. The AD ($^{*}p < 0.05$) group showed a significantly worse score from the MCI-A before supplementation. Among the four groups, the organic group exceptionally showed a significant ($^{\#\#\#}p < 0.00$l) improvement after PUFA supplementation. In contrast, there were no significant effects of supplementation in the MCI-A, MCI-P and AD groups. $^{\$}p < 0.05$ vs. MCI-A with supplementation, $^{\dagger}p < 0.05$ vs. organic with supplementation. Open bars: before supplementation; shaded bars: after supplementation.

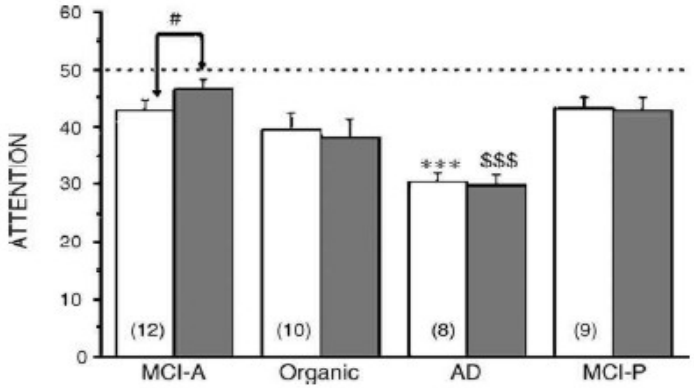

Fig. 4. Comparison of the attention domain. Only the MCI-A group showed a significant ($^{\#}p < 0.05$) improvement of attention. The remaining groups showed no improvement after the PUFA supplementation. The AD group showed significantly low scores before and after supplementation compared with MCI-A group. $^{***}p < 0.01$ vs. MCI-A without supplementation, $^{\$\$\$}p < 0.01$ vs. MCI-A with supplementation. Open bars: before supplementation; shaded bars: after supplementation.

ORIGINAL CONTRIBUTION

ω-3 Fatty Acid Treatment in 174 Patients With Mild to Moderate Alzheimer Disease: OmegAD Study

A Randomized Double-blind Trial

Yvonne Freund-Levi, MD; Maria Eriksdotter-Jönhagen, MD, PhD; Tommy Cederholm, MD, PhD; Hans Basun, MD, PhD; Gerd Faxén-Irving, PhD; Anita Garlind, MD, PhD; Inger Vedin, MSci; Bengt Vessby, MD, PhD; Lars-Olof Wahlund, MD, PhD; Jan Palmblad, MD, PhD

Background: Epidemiologic and animal studies have suggested that dietary fish or fish oil rich in ω-3 fatty acids, for example, docosahexaenoic acid and eicosapentaenoic acid, may prevent Alzheimer disease (AD).

Objective: To determine effects of dietary ω-3 fatty acid supplementation on cognitive functions in patients with mild to moderate AD.

Design: Randomized, double-blind, placebo-controlled clinical trial.

Participants: Two hundred four patients with AD (age range [mean±SD], 74±9 years) whose conditions were stable while receiving acetylcholine esterase inhibitor treatment and who had a Mini-Mental State Examination (MMSE) score of 15 points or more were randomized to daily intake of 1.7 g of docosahexaenoic acid and 0.6 g of eicosapentaenoic acid (ω-3 fatty acid–treated group) or placebo for 6 months, after which all received ω-3 fatty acid supplementation for 6 months more.

Main Outcome Measures: The primary outcome was cognition measured with the MMSE and the cognitive portion of the Alzheimer Disease Assessment Scale. The secondary outcome was global function as assessed with the Clinical Dementia Rating Scale; safety and tolerability of ω-3 fatty acid supplementation; and blood pressure determinations.

Results: One hundred seventy-four patients fulfilled the trial. At baseline, mean values for the Clinical Dementia Rating Scale, MMSE, and cognitive portion of the Alzheimer Disease Assessment Scale in the 2 randomized groups were similar. At 6 months, the decline in cognitive functions as assessed by the latter 2 scales did not differ between the groups. However, in a subgroup (n=32) with very mild cognitive dysfunction (MMSE >27 points), a significant ($P<.05$) reduction in MMSE decline rate was observed in the ω-3 fatty acid–treated group compared with the placebo group. A similar arrest in decline rate was observed between 6 and 12 months in this placebo subgroup when receiving ω-3 fatty acid supplementation. The ω-3 fatty acid treatment was safe and well tolerated.

Conclusions: Administration of ω-3 fatty acid in patients with mild to moderate AD did not delay the rate of cognitive decline according to the MMSE or the cognitive portion of the Alzheimer Disease Assessment Scale. However, positive effects were observed in a small group of patients with very mild AD (MMSE >27 points).

Trial Registration: clinicaltrials.gov Identifier: NCT00211159

Arch Neurol. 2006;63:1402-1408

Klinické štúdie s podávaním suplementácie omega 3 nenasýtených mastných kyselín

- Nebol v nich dokázaný efekt u pacientov s rozvinutou Alzheimerovou chorobou
- Bolo zistené zlepšenie u pacientov s ľahkým kognitívnym deficitom a ľahkou formou demencie
  - Potenciál skôr v prevencii ako liečbe?

Ginkgo biloba

- Jeden z najstarších žijúcich druhov stromov
- Výťažky z listov a semien sú jedným z najčastejšie študovaných prírodných liečiv
- Z viac ako 40 látok, ktoré gingko obsahuje, za účinné sa pokladajú flavonoidy a terpenoidy
- Mechanizmus účinku spočíva najmä v ich antioxidatívnych vlastnostiach – fungujú ako vychytávače (scavengery) voľných radikálov kyslíka, ktorý sa podieľa na poškodzovaní tkanív

Extrakt gingko biloba

- Dnes v liečbe používame vysoko koncentrovaný extrakt zo sušených zelených listov gingka
- Obsahuje 24 – 32% flavonoidov a 6-12 % terpenoidov
- Dávkuje sa 120 – 240 mg denne v 1-3 dávkach

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Main results

36 trials were included but most were small and of duration less than three months. Nine trials were of six months duration (2016 patients). These longer trials were the more recent trials and generally were of adequate size, and conducted to a reasonable standard. Most trials tested the same standardised preparation of Ginkgo biloba, EGb 761, at different doses, which are classified as high or low. The results from the more recent trials showed inconsistent results for cognition, activities of daily living, mood, depression and carer burden. Of the four most recent trials to report results three found no difference between Ginkgo biloba and placebo, and one reported very large treatment effects in favour of Ginkgo biloba.

There are no significant differences between Ginkgo biloba and placebo in the proportion of participants experiencing adverse events.

A subgroup analysis including only patients diagnosed with Alzhiemer's disease (925 patients from nine trials) also showed no consistent pattern of any benefit associated with Ginkgo biloba.

Authors' conclusions

Ginkgo biloba appears to be safe in use with no excess side effects compared with placebo. Many of the early trials used unsatisfactory methods, were small, and publication bias cannot be excluded. The evidence that Ginkgo biloba has predictable and clinically significant benefit for people with dementia or cognitive impairment is inconsistent and unreliable.

Weinmann et al. BMC Geriatrics 2010, 10:14
http://www.biomedcentral.com/1471-2318/10/14

BMC Geriatrics

RESEARCH ARTICLE Open Access

Effects of Ginkgo biloba in dementia: systematic review and meta-analysis

Stefan Weinmann[1*], Stephanie Roll[1], Christoph Schwarzbach[2], Christoph Vauth[2], Stefan N Willich[1]

Abstract

Background: The benefit of Ginkgo biloba has been discussed controversially. The aim of this review was to assess the effects of Ginkgo biloba in Alzheimer's disease as well as vascular and mixed dementia covering a variety of outcome domains.

Methods: We searched MEDLINE, EMBASE, the Cochrane databases, CINAHL and PsycINFO for controlled trials of ginkgo for Alzheimer's, vascular or mixed dementia. Studies had to be of a minimum of 12 weeks duration with at least ten participants per group. Clinical characteristics and outcomes were extracted. Meta-analysis results were expressed as risk ratios or standardized mean differences (SMD) in scores.

Results: Nine trials using the standardized extract EGb761® met our inclusion criteria. Trials were of 12 to 52 weeks duration and included 2372 patients in total. In the meta-analysis, the SMDs in change scores for cognition were in favor of ginkgo compared to placebo (-0.58, 95% confidence interval [CI] -1.14; -0.01, p = 0.04), but did not show a statistically significant difference from placebo for activities in daily living (ADLs) (SMD = -0.32, 95% CI -0.66; 0.03, p = 0.08). Heterogeneity among studies was high. For the Alzheimer subgroup, the SMDs for ADLs and cognition outcomes were larger than for the whole group of dementias with statistical superiority for ginkgo also for ADL outcomes (SMD = -0.44, 95% CI -0.77; -0.12, p = 0.008). Drop-out rates and side effects did not differ between ginkgo and placebo. No consistent results were available for quality of life and neuropsychiatric symptoms, possibly due to the heterogeneity of the study populations.

Conclusions: Ginkgo biloba appears more effective than placebo. Effect sizes were moderate, while clinical relevance is, similar to other dementia drugs, difficult to determine.

HUMAN PSYCHOPHARMACOLOGY
Hum. Psychopharmacol Clin Exp 2007; **22**: 199–210.
Published online 25 April 2007 in Wiley InterScience
(www.interscience.wiley.com) **DOI**: 10.1002/hup.837

Acute cognitive effects of standardised Ginkgo biloba extract complexed with phosphatidylserine

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[2]*Institute of Biomedical Technologies (ITB-CNR), Segrate (Milano), Italy*

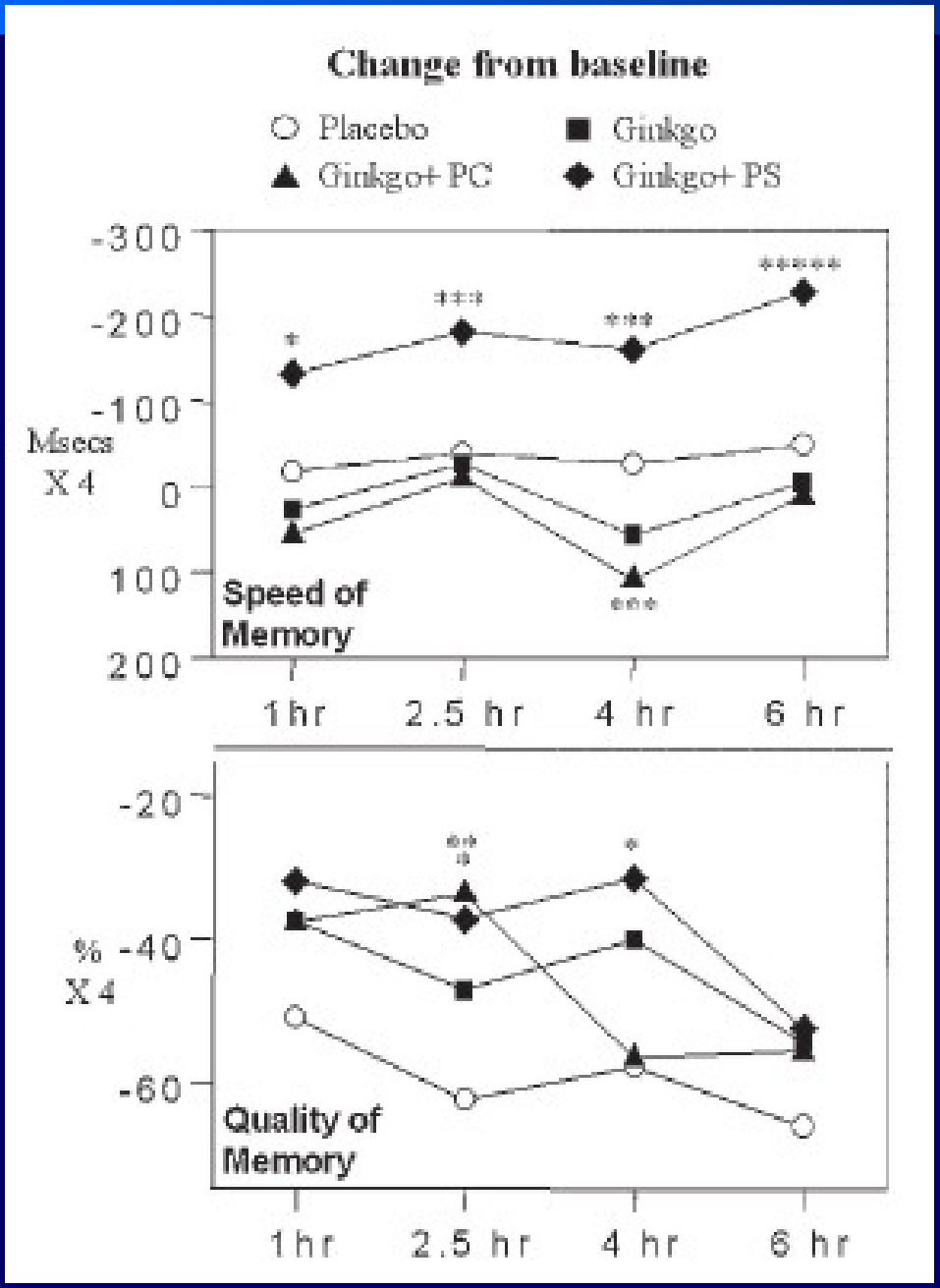
Recent data suggest that the complexation of standardised Ginkgo biloba extract (GBE) with soy-derived phospholipids enhances the bio-availablity of GBE's active components. The current study therefore aimed to assess the comparative cognitive and mood effects of a low dose of GBE and products complexing the same extract with either phosphatidylserine or phosphatidylcholine.

The study utilised a placebo-controlled, multi-dose, double-blind, balanced-crossover design. Twenty-eight healthy young participants received 120 mg GBE, 120 mg GBE complexed with phosphatidylserine (Virtiva™), 120 mg GBE complexed with phosphatidylcholine and a matching placebo, on separate days 7 days apart. Cognitive performance was assessed using the Cognitive Drug Research (CDR) computerised test battery and Serial Subtraction tasks immediately prior to dosing and at 1, 2.5, 4 and 6 h thereafter. The primary outcome measures were the four aspects of cognitive performance, which have previously been derived by factor analysis of CDR subtests. Levels of terpenoids (bilobalide, ginkgolide A and ginkgolide B) were concomitantly assessed in plasma samples taken pre-dose and at 3 and 6.5 h post-dose.

In keeping with previous research utilising the same methodology, 120 mg of GBE was not associated with markedly improved performance on the primary outcomes. However, administration of GBE complexed with phosphatidylserine resulted both in improved secondary memory performance and significantly increased speed of memory task performance across all of the post-dose testing sessions. Enhancement following GBE complexed with phosphatidylcholine was restricted to a modest improvement in secondary memory performance which was restricted to one post-dose time point. All three treatments were associated with improved calmness. There were no significant differences in post-dose levels of terpenoids between the Ginkgo containing treatments, although this latter finding may be attributable to methodological factors.

Complexation with phosphatidylserine appears to potentiate the cognitive effects associated with a low dose of GBE. Further research is required to identify whether this effect is due to the complexation of the extracts, their mere combination, or the separate psychopharmacological actions of the two extracts.

KEY WORDS — Ginkgo; phosphatidylserine; phosphatidylcholine; memory; attention; mood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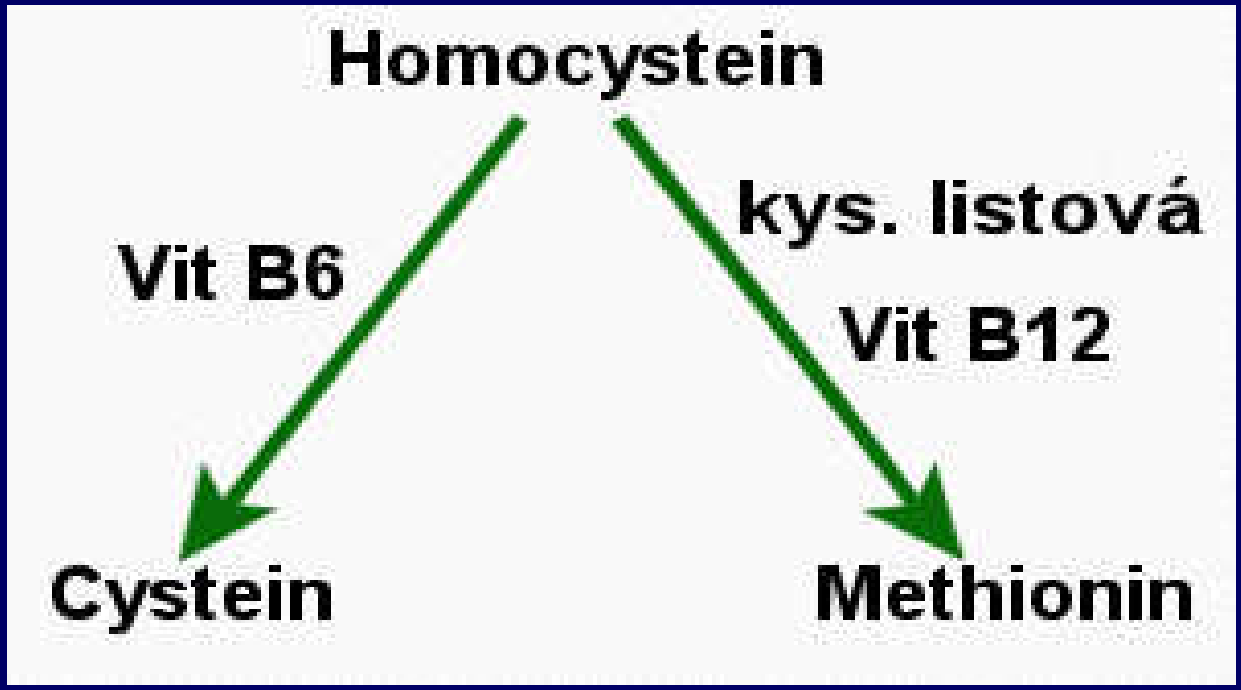

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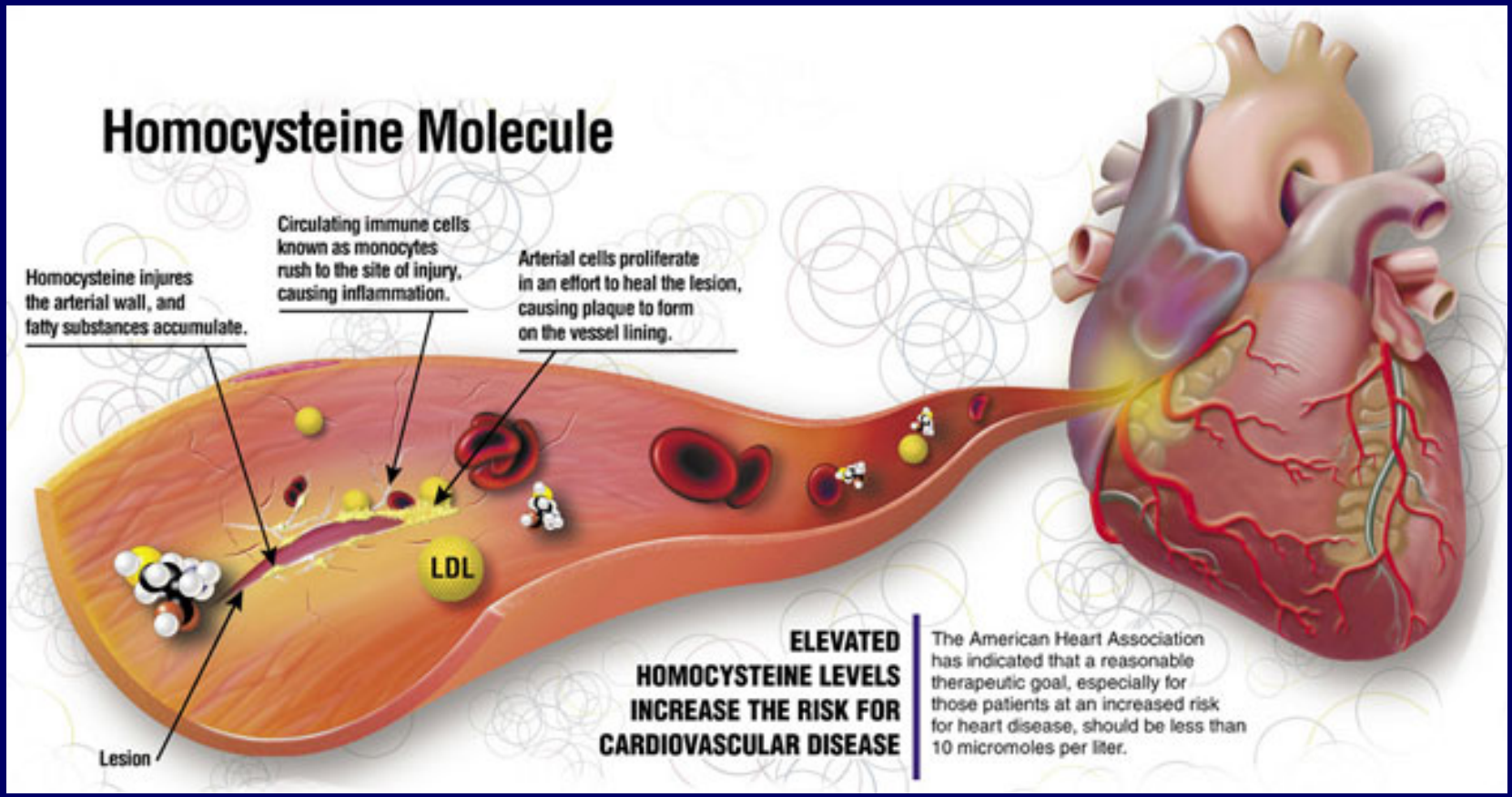


Journal of Internal Medicine 2003; 254: 67–75

Effect of vitamins and aspirin on markers of platelet activation, oxidative stress and homocysteine in people at high risk of dementia

VITAL TRIAL COLLABORATIVE GROUP*

Abstract. VITAL Trial Collaborative Group. Effect of vitamins and aspirin on markers of platelet activation, oxidative stress and homocysteine in people at high risk of dementia. *J Intern Med* 2003; 254: 67–75.

Objectives. To examine the association of cognitive impairment with platelet activation and reactive oxygen species and total homocysteine levels; and to assess the biochemical efficacy of treatment with aspirin and vitamin supplements in people at high risk of dementia.

Subjects. People with dementia or mild cognitive impairment.

Design and intervention. In a $2 \times 2 \times 2$ factorial design trial, 149 people at high-risk of dementia were randomized to receive either low-dose aspirin (81 mg) or placebo; and folic acid (2 mg) plus vitamin B12 (1 mg) or placebo; and vitamins E (500 mg) plus C (200 mg) or placebo. Participants were seen twice before and once after 12 weeks of treatment.

Main outcome measures. At each visit, participants had their cognitive function assessed and had blood collected for homocysteine, folate and vitamin B12 determination and urine collected for markers of platelet activation (11-dehydro-thromboxane B_2) and reactive oxygen species (8-epi-$PGF_{2\alpha}$).

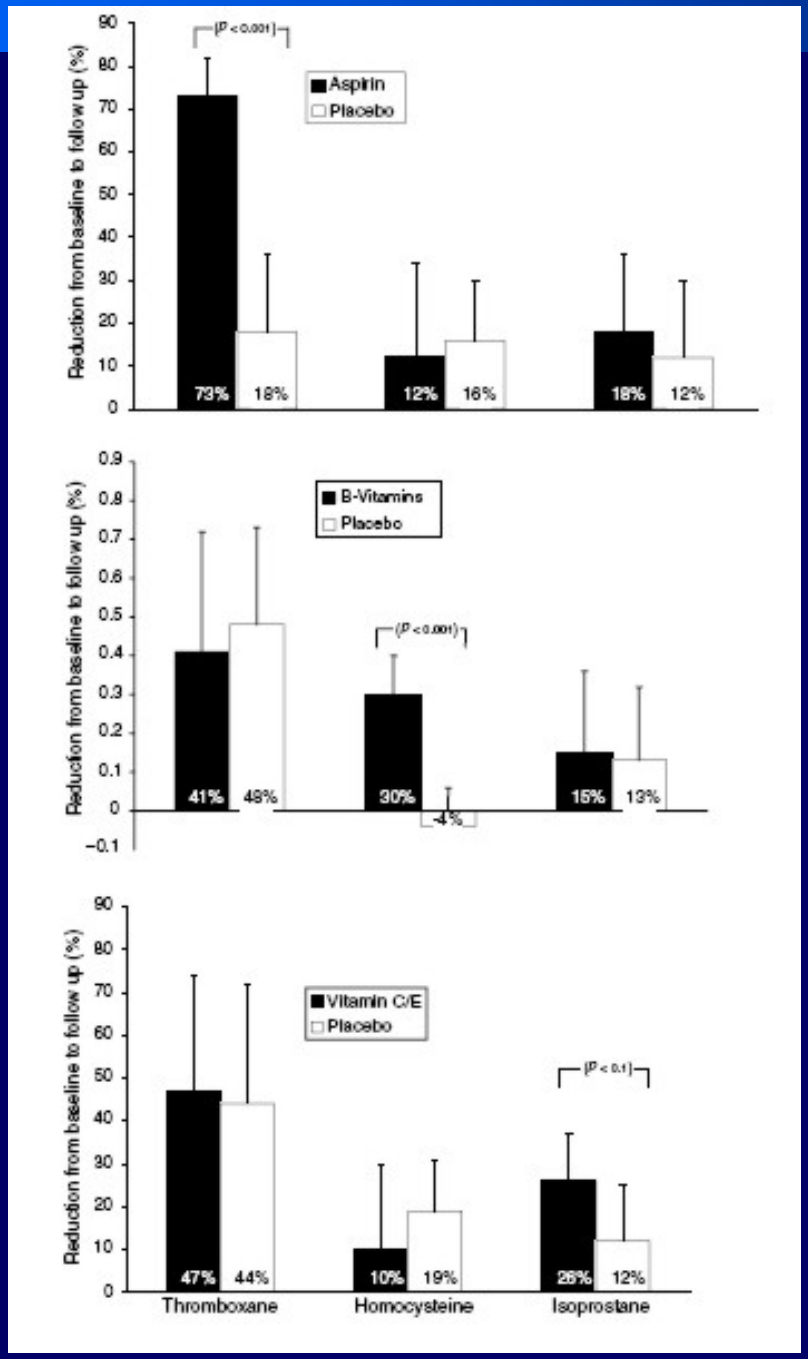
Results. Prior to treatment, cognitive function was inversely related with homocysteine and with urinary thromboxane and isoprostane, and these associations were independent of age. Aspirin was associated with a median reduction in 11-dehydrothromboxane B_2 of 73% ($P < 0.001$). B-vitamins lowered plasma homocysteine concentration by 30% ($P < 0.0001$) and antioxidant vitamins lowered isoprostane excretion by 26% ($P < 0.1$). No effect of treatment on cognitive function was detected.

Conclusions. Aspirin and B-vitamins were effective in reducing biochemical factors associated with cognitive impairment in people at risk of dementia. Large-scale trials are now required to assess the relevance of aspirin and B-vitamins for the maintenance of cognitive function in people at risk of dementia.

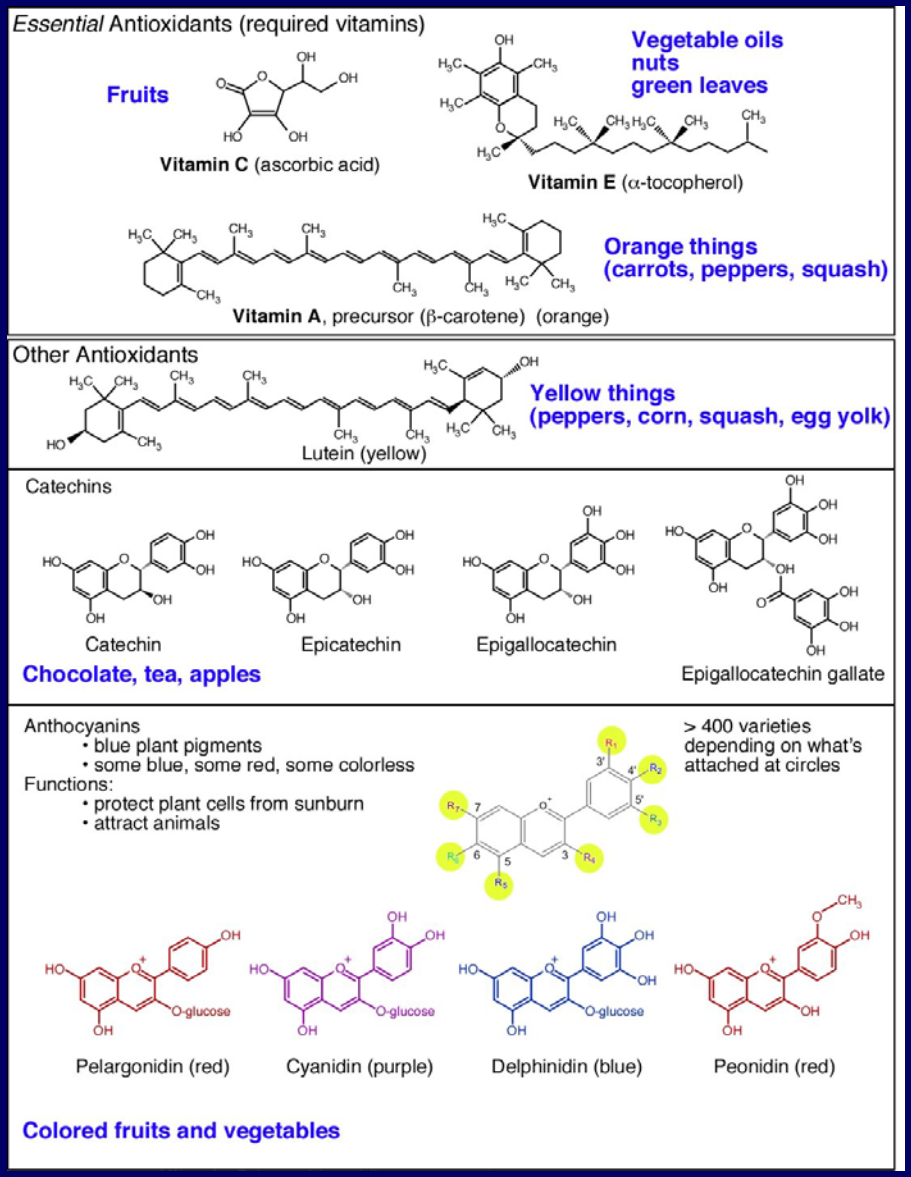
*Writing committee: Robert Clarke, Georgina Harrison and Sue Richards.

Steering Committee: Marc Budge, Robert Clarke, John Grimley Evans, Georgina Harrison, Judy Haworth, Robin Jacoby, Elizabeth King, Sue Richards, A David Smith Gordon Wilcock.

Coordinating Centre: *Clinical Trial Service Unit, Radcliffe Infirmary,*


Reduction from baseline to follow up (%)
Aspirin
Placebo
73%
18%
12%
16%
18%
12%
B-Vitamins
Placebo
41%
48%
30%
-4%
15%
13%
Vitamin C/E
Placebo
47%
44%
10%
19%
26%
12%
Thromboxane
Homocysteine
Isoprostane

Antioxidanty



Vitamín E

- Liposolubilný vitamín s prirodzeným antioxidatívnym účinkom (scavenger)
  - Nachádza sa v obilí, orechoch, mlieku a vajciach
  - Poznáme 4 rôzne formy tokoferolu – alfa až delta, alfa má najvýraznejšie antioxidatívne účinky

Vitamín E

- Epidemiologické štúdie
  - Strava bohatá na antioxidanty (vitamín C,E) môže viesť k nižšiemu výskytu Alzheimerovej choroby a demencie
- Klinické štúdie
  - V otvorených štúdiách menší výskyt inštitucionalizácie a potreby opatrovania
  - V dvojito slepej štúdii bez rozdielu v porovnaní s placebom

?.....!