

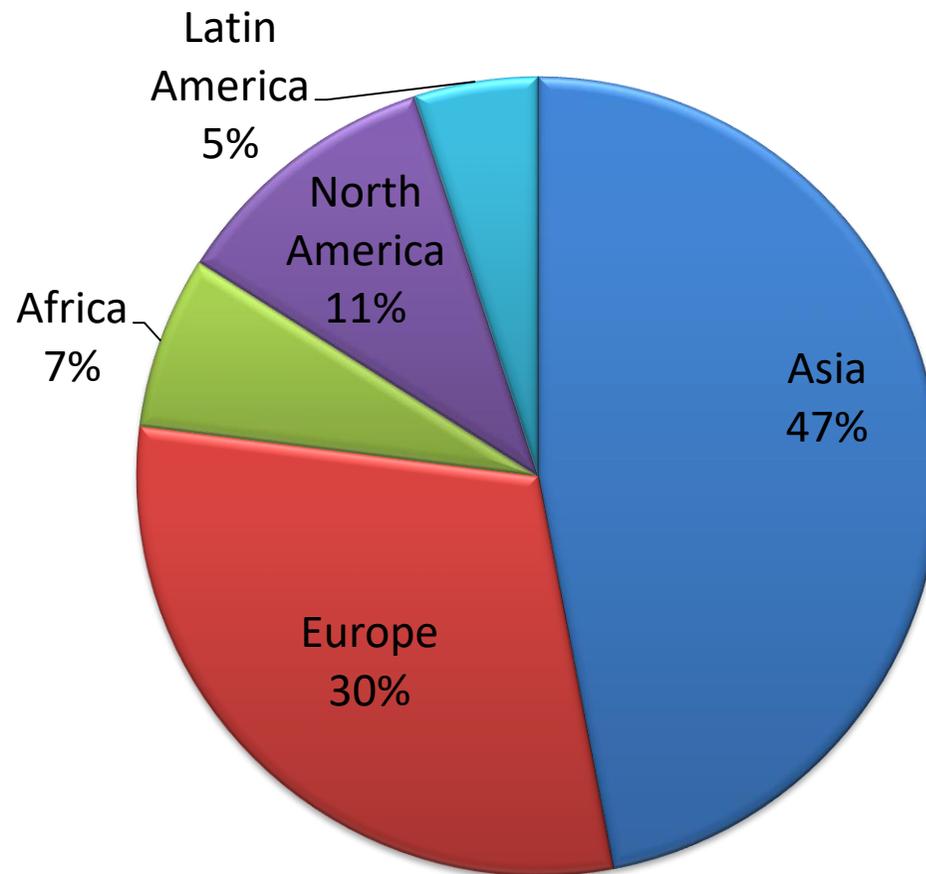
CHALLENGES FACED IN DEMENTIA AND COMMUNITY-BASED APPROACHES IN PREVENTION

Takao Suzuki

Institute of Gerontology, J.F.Oberlin University
National Center for Geriatrics and Gerontology

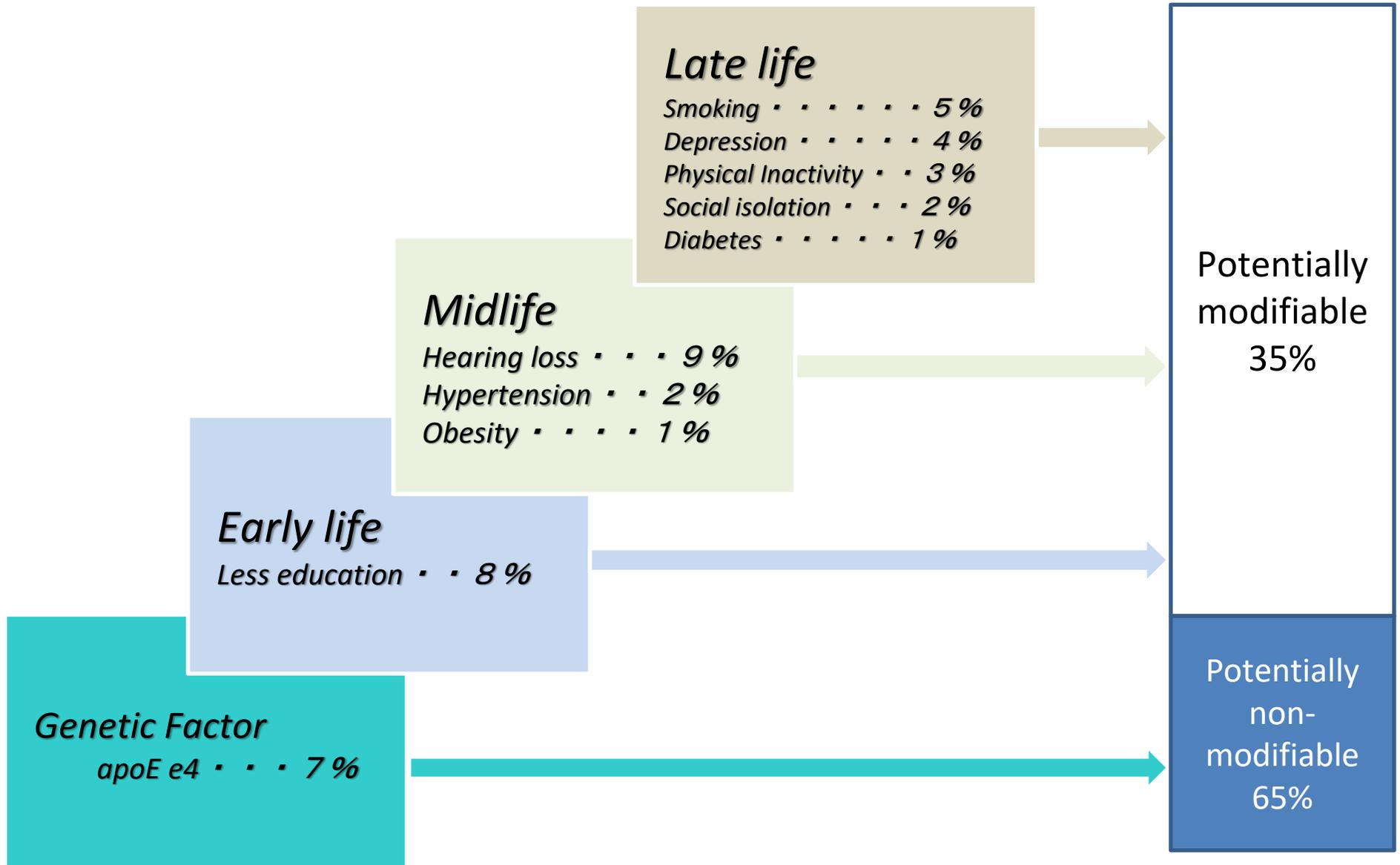
Global Distribution of Incident Dementia (7.7 million new cases per year)

WHO Report 2012–Dementia a Public Health Priority



One new case every 4 seconds !

Life course model of contribution of modifiable risk factors to dementia (Lancet Commissions; 2018)



What life-style is good for preventing Alzheimer's disease ?

Diet

- ✓ Fish intake (≥ 18.5 /day)
- ✓ Vitamin C, D, E

Exercise

- ✓ Regular exercise more than 3 times/week
- ✓ Cognicize

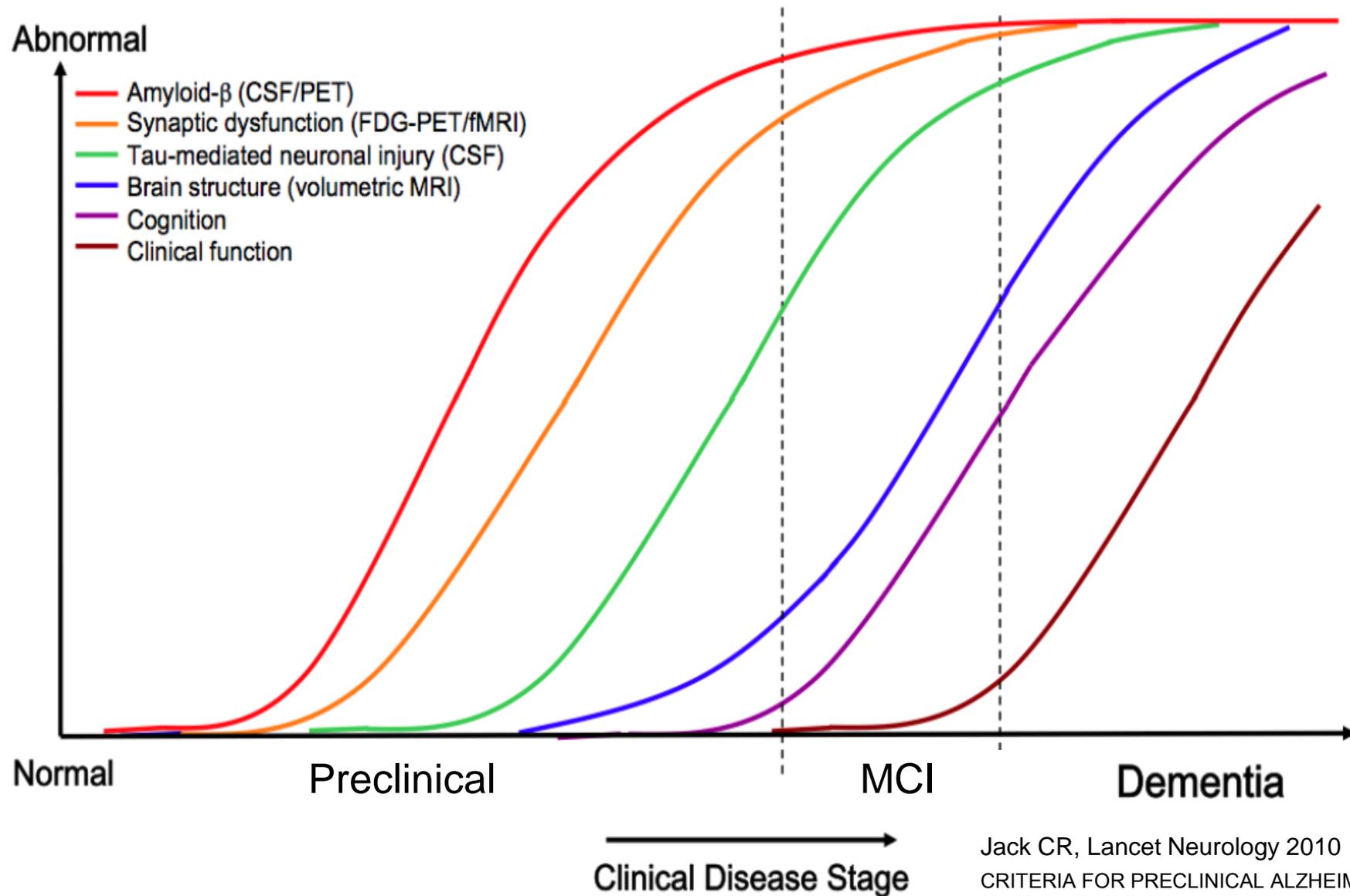
Communication

- ✓ Living with large family

Intellectual performances

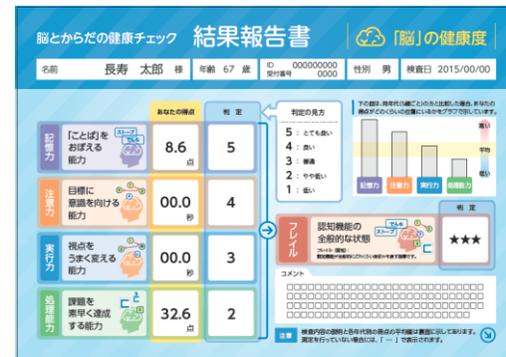
- ✓ Reading books, Chess, Music play
- ✓ Social dance

Progress in Alzheimer's disease



Jack CR, Lancet Neurology 2010
 CRITERIA FOR PRECLINICAL ALZHEIMER'S
 DISEASE – AAICAD 2010

Cognitive Function Assessment (NCGG-FAT)



National Center for Geriatrics and Gerontology functional assessment tool

- Trail Making Test part A (注意)
- Trail Making Test part B (実行機能)
- Symbol digit coding task (情報処理速度)
- Word memory (単語の記憶)
- Well reliability and validity
- Web-version in English, Chinese, Korea

所要時間：15分～20分



1. MCIの判定が可能
2. 結果レポート作成機能があり、自分の状態を客観的に知ることができる

特許：特願2012-148680

Multicomponent Exercise Program for MCI

Suzuki T, et al., PLoS ONE 2013



Exercise with learning-task



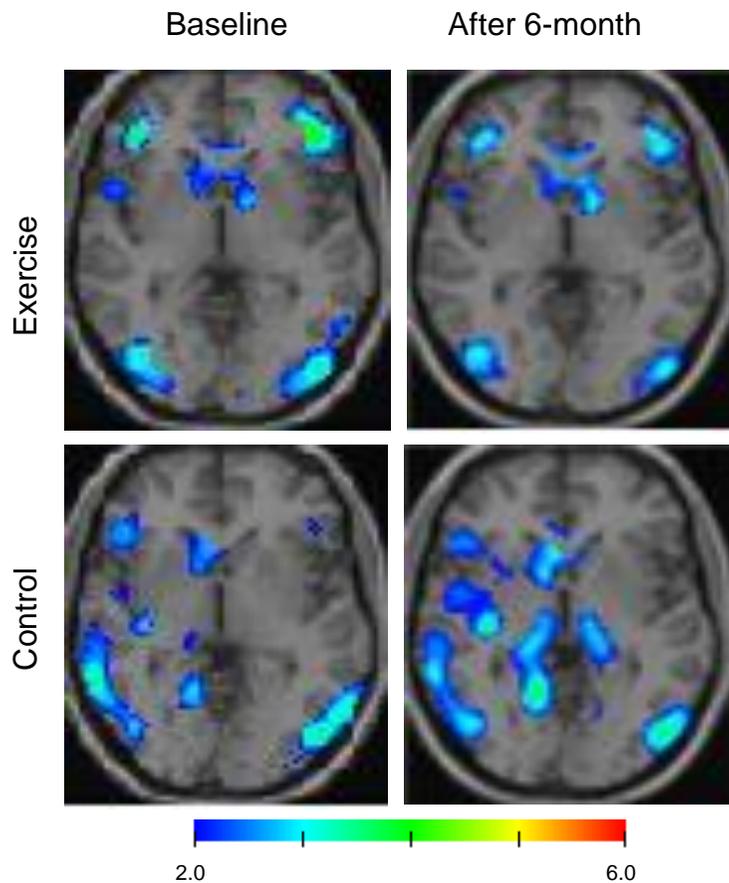
Aerobic exercise



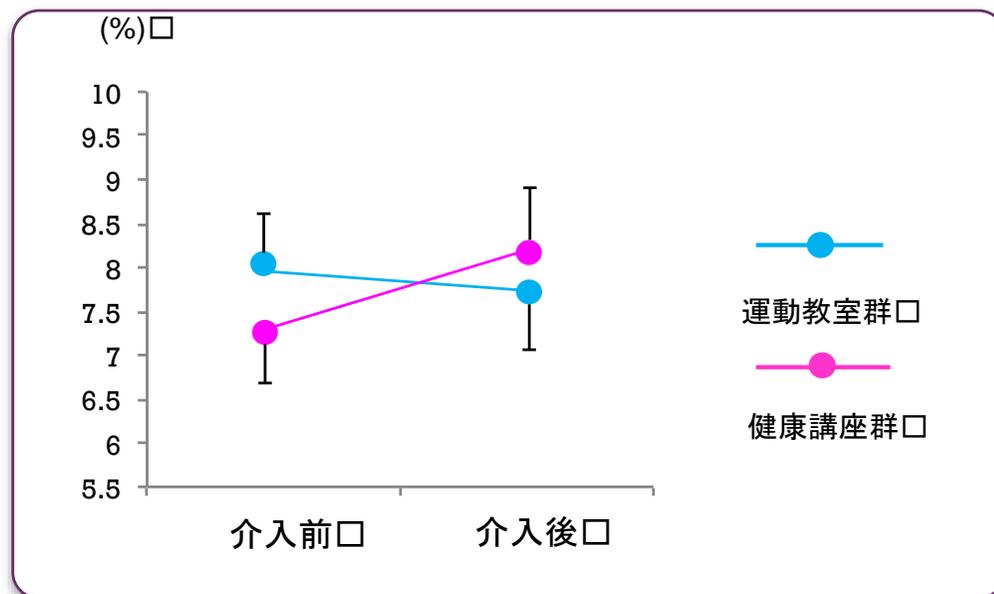
Muscle strength

Comparison of brain atrophy

Suzuki T, et al., PLoS ONE 2013



脳萎縮領域の割合 (健忘型MCI高齢者) □



慣れてきたら、次の課題に移りましょう。

ヨガニサイズとは、コグニション（認知）とエクササイズ（運動）を組み合わせた造語で、コグニション課題とエクササイズ課題を同時に行うことで、脳とからだの機能を効果的に向上させることをねらいます。

Prevention of Dementia in the Community in Japan “COGNICISE”

アルツハイマー病と密接に関連しているのは？



危険因子のなかでも、身体的不活動を改善することはアルツハイマー病の予防につながる可能性があります。身体活動には、特別に時間をとって実施する運動と、日常生活の中で実施する活動とが含まれ、これらの要素をバランスよく取り込んでいくことが身体活動量を向上させるために重要となります。

STEP 1 コグニション課題

両足で立って、しっかり考えながら1から順に数をかぞえ、「3」の倍数では、手をたたきます。

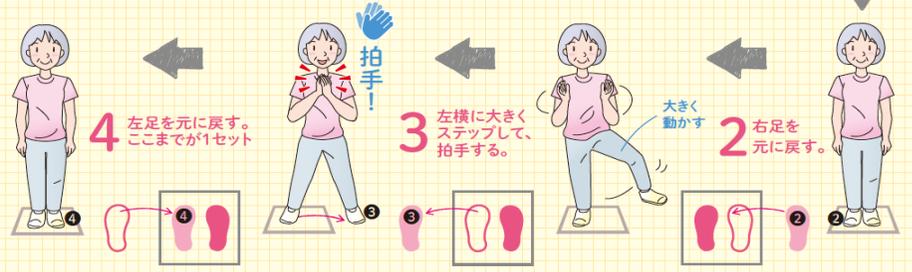


STEP 2 エクササイズ(ステップ)課題

ステップを覚えます。
①右足右へ→②右足戻す→③左足左へ→④左足戻す
(①～④を繰り返します)
リズムよくステップします



STEP 3 コグニサイズ 運動しながら、脳を刺激する ステップ運動+3の倍数で拍手



まずは、「3」の倍数で手を叩くことから始めてみましょう。慣れてきたら、ステップの順番を変えたり(例:左右や前後を組み合わせる)、手をたたく倍数の数や数の数え方(例:「13」からかぞえ始める、数を引ながらかぞえる、など)を変えたりと様々な種類を試してみましょう。工夫次第でいろんな方法で楽しめます

コグニサイズでは、運動と認知トレーニングを組み合わせることで、脳への刺激を促すことが期待できますが、これだけで認知症が予防できるわけではありません。普段からの食生活や睡眠、適度な運動など、健康的な生活を心がけることも重要です。

Recent Topics of Dementia

1) Decrease of Prevalence and Incidence of Dementia.
(FHS & HRS in US)

2)BDNF: Possible Preventive Nutritional Factor for Dementia.

Incidence of Dementia over Three Decades in the Framingham Heart Study

(Satizabal CL et al. N Eng J Med. 2016)

The 5-year age- and sex-adjusted cumulative hazard rates for dementia;
3.6 /100 persons during the first epoch (late 1970s- early 1980s)
2.8 /100 persons during the second epoch (late 1980s- early 1990s)
2.2 /100 persons during the third epoch (late 1990s- early 2000s)
2.0 /100 persons during the fourth epoch (late 2000s- early 2010s)

Relative to the incidence during the first epoch, the incidence declined by;
22% during the second epoch
38% during the third epoch
44% during the fourth epoch

The risk reduction was observed only among persons who had at least a high school diploma (hazard ratio, 0.77; 95%CI, 0.67 to 0.88).

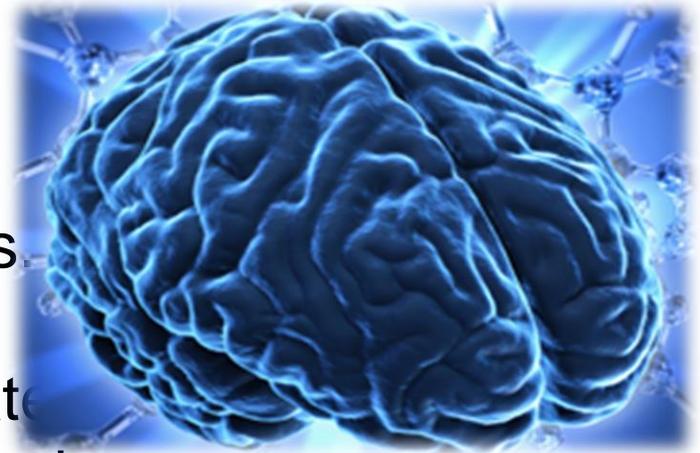
Health & Retirement Study (HRS)

	2000年	2012年
Subjects (65 yrs old and over)	10,546	10,511
Average Age (yrs)	75.0	74.8
Female (%)	58.4	56.3
<hr/>		
		
Prevalence of Dementia (Sex & Age Adjst)	11.6%	8.8% (8.6%)

Characteristics of BDNF

(BDNF : Brain-derived neurotrophic factor)

- Highly concentrated in the hippocampus.
- Important in synaptic plasticity, and contribution to neurogenesis in the dentate gyrus.
- Pivotal role in age-related memory impairment and association with age-related atrophy of the hippocampus.
- Remarkable reduction in AD, MCI and depressive symptoms.
- May be increased by appropriate exercise and nutrients / food.



Elderly women living in the community (≥ 75 yrs. old)

Inclusion criteria

- ✓ having subjective memory complains
- ✓ MMSE : $22 < > 27$
- ✓ BDND : $< \text{av.} - 2\text{SD}$

Exclusion criteria

- ✓ no memory complains
- ✓ MMSE (≤ 22 and/or ≥ 27)
- ✓ BDNF ($\geq \text{av.} - 2\text{SD}$)
- ✓ daily intake of cheese
- ✓ allergic for milk and its product
- ✓ high BP ($\geq 160/100$ mmHg)
- ✓ sever DM and CKD
- ✓ refuse to participate

participants (informed consented) N=71

Randomization

fermented cheese n=36

Non-fermented cheese n=35

3M intervention

primary analysis
(36 completed)

primary analysis
(31 completed)

3M washing out
&
cross over

non-fermented cheese n=29

fermented cheese n=30

3M intervention

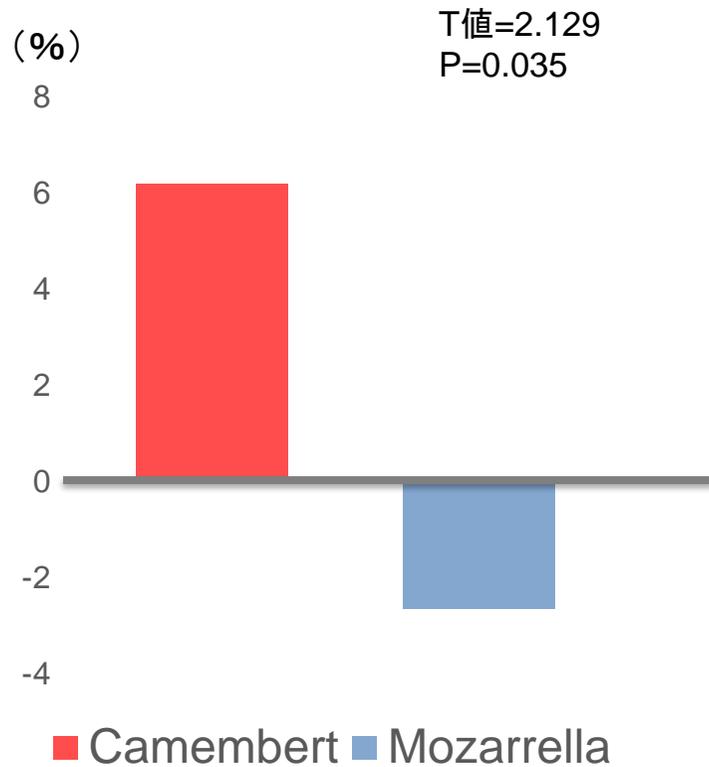
secondary analysis
(29 completed)

secondary analysis
(30 completed)

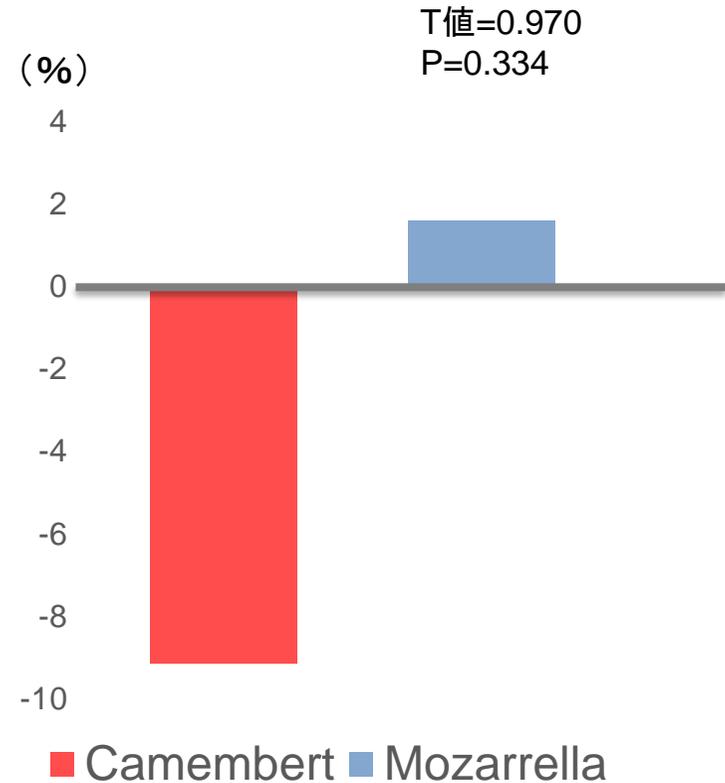
Data combined in both intervention and controlled groups

Final analysis on 66 vs 60

Change of BDNF (%)



Change of GDS (%)



Potential Brain mechanisms for preventive strategies in dementia

(Lancet Comm. 2018)

