

Alzheimer's Disease

Current Status, Future Perspectives Nicola Oliver, Select 74, 11th May 2017

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Overview & Pathophysiology	
Risk Factors	
Incidence & Prevalence	
Survival & Mortality	
Current Pharma Treatments	
Future Advances	
Insurance Perspective	
Summary	

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TENTH REVISION



ICD-10 is a new code set for reporting medical diagnoses & inpatient procedures.

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Prevalence of types of dementia



Cognitive Problem-Decline solving Language Progressive Incurable







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Alzheimer's disease trajectory















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10



Overview & Pathophysiology	}
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Current Pharma Treatments)
Future Advances)
Insurance Perspective)
Summary	

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Cognitive neurology

RESEARCH PAPER

Risk factors for predicting progression from mild cognitive impairment to Alzheimer's disease: a systematic review and meta-analysis of cohort studies

Jie-Qiong Li,³ Lan Tan,^{1,2,3} Hui-Fu Wang,² Meng-Shan Tan,³ Lin Tan,³ Wei Xu,¹ Qing-Fei Zhao,¹ Jun Wang,¹ Teng Jiang,² Jin-Tai Yu^{1,2,3,4} Relative risk of progression from MCI to dementia in T2DM vs. control

Alzheimer's disease

1.52 (1.20-1.91)

REVIEW

Diabetes as a risk factor for dementia and mild cognitive impairment: a meta-analysis of longitudinal studies

G. Cheng," C. Huang," H. Deng' and H. Wang'

Separtment of Nuclear Medicine and Endocrossings: The First Affliated Inspiral, Disregging Medical University, Desegging and Toppettment of Separtment of Net Net Inspiral of Microsoft, Microsoft, Orion Relative risk for type 2 diabetes patient vs. control

Vascular dementia Al

Alzheimer's disease

2.48 (2.08-2.96)

1.46 (1.20-1.77)

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Lifestyle Risk Factors







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Increased Risk of Developing Alzheimer's Disease Based On Inheriting APOE4 Gene Variant From One Parent Vs. Both



Genotype	E2/E2	E2/E3	E2/E4	E3/E3	E3/E4	E4/E4
Disease Risk	40% less likely	40% less likely	2-3 times more likely	Average risk	3 times more likely	10-15 times more likely

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16





Potential number of AD cases that could be prevented through risk factor reduction

Source: Barnes D and Yaffe K (2011) The projected effect of risk factor reduction on Alzheimer's disease prevalence Lancet Neurology 10:819-828

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Overview & Pathophysiology	
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Future Advances	
Insurance Perspective	
Summary	

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Projected increases in the number of people with dementia in the UK (2012–2051), assuming constant age-specific prevalence, by gender

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Projected increases in the number of people with dementia in the UK (2012–2051), assuming constant age-specific prevalence, by age group

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National Long-term care survey (US)

• Decline in prevalence of severe cognitive impairment 1982-1999, 5.7% to 2.9%

US Health and Retirement Study

• Decline in cognitive impairment between 1993-2002 from 12.2% to 8.7%

UK Cognitive Function and Ageing Study

• Decline in dementia prevalence rates from 8.3% to 6.5% between 1991 and 2011

Rotterdam Study

• Observed decrease in dementia incidence between 1990 and 2000 – increase in treatment for cardiovascular risk factors

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Overview & Pathophysiology	
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Medical Research Council's cognitive function and ageing study (MRC CFAS)

Kaplan-Meier survival curves for people with and without dementia

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	Men			Women		
Age	Cases	BLSA	US Life	Cases	BLSA	US Life
(years)			Tables			Tables
60	9.3	28.5	20.0	10.6	32.5	24.1
65	7.8	23.5	16.1	8.9	27.5	19.8
70	6.5	18.7	12.5	7.5	22.6	15.6
75	5.5	14.1	9.4	6.3	17.7	11.9
80	4.6	10.3	6.7	5.2	13.2	8.6
85	3.8	7.3	4.7	4.4	9.4	5.9
90	3.2	5.1	3.3	3.7	6.4	4.1
95	2.7	3.6	3.2	3.1	4.3	2.8

Median remaining survival time (years) of Alzheimer disease cases following diagnosis and comparison with BLSA participants and US Life tables (Brookmeyer et al, 2002)

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DEATHS E & W 2015



■ Males ■ Females



Dementia and Alzheimer disease has replaced ischaemic heart diseases as the leading cause of death in England and Wales, accounting for 11.6% of all deaths registered in 2015. In 2015, dementia and Alzheimer's disease became the leading cause of death in part because people are simply living longer but also because of improved detection and diagnosis Updating of the international rules for determining the underlying cause of death is also a factor, with the increase in cases attributed to these conditions accompanied by falls in other causes



Female age-standardised mortality rates, for top 5 leading causes, 2001 to 2015

MEDICAL

INTELLIGENCE



Male age-standardised mortality rates, for top 5 leading causes, 2001 to 2015

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Current Treatment Approaches for AD









"In the decade of 2002-2012, 244 drugs for Alzheimer's were tested in clinical trials; only one of the 244 drugs successfully completed clinical trials and went on to receive approval from the FDA"



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Gene Silencing with CRISPR



Gene Insertion with CRISPR



To insert a gene, the new gene is added into the original CRISPR plasmid. It is designed to line up perfectly with the cut DNA strands, so the cell uses a different technique, homology directed repair, to incorporate a new stretch of DNA into the genome.

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Overview & Pathophysiology	
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Incidence & Prevalence	
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Future Advances	
Insurance Perspective	
Summary	

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Material impact but less than for life insurance

ADEO 4.5%

Significantly more than insurance companies could be expected to absorb without an increase in premium rates

Average CI claim rates could increase by 26%

16% for males, 41% for females



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Summary	

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39



Thank you

Questions?

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40



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