The effect of functional capacity and concomitant medications on life expectancy in Alzheimer's disease.

Wattmo, Carina; Londos, Elisabet; Minthon, Lennart

2014

Document Version:
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Wattmo, C., Londos, E., & Minthon, L. (2014). *The effect of functional capacity and concomitant medications on life expectancy in Alzheimer's disease.*. Poster session presented at Alzheimer's Association International Conference (AAIC), 2014, Copenhagen, Denmark.

Total number of authors:
3

The effect of functional capacity and concomitant medications on life expectancy in Alzheimer's disease

Carina Wattmo, Elisabet Londos, Lennart Minthon
Clinical Memory Research Unit, Department of Clinical Sciences, Malmö, Lund University, Sweden.

Conclusions

Instrumental activities of daily living capacity (ADL), but not basic ADL, was an important predictor of life-span after diagnosis of Alzheimer's disease (AD) and should be considered by clinicians and community-based services when estimating prognosis in AD. Antidiabetic therapy was a strong risk factor for reduction in life expectancy among AD patients.

Background

An increased knowledge of the predictors of survival in AD patients treated with cholinesterase inhibitors (ChEIs) is important for clinicians and for the health services. Impairment in ADL, somatic diseases, and psychiatric symptoms may influence mortality in AD, in addition to male sex, older age, and lower cognitive ability, which are factors that are commonly associated with a shorter life-span. We aimed to study the impact of functional capacity and concomitant medications on the life expectancy of AD patients in clinical practice.

Methods

The Swedish Alzheimer Treatment Study (SATS) is a prospective, observational, multicenter study for the long-term assessment of ChEI treatment in a routine clinical setting. In total, 1,258 outpatients with a clinical diagnosis of probable or possible AD were included. At the start of ChEI therapy (shortly after diagnosis), 1,021 of the patients had mild-to-moderate AD (Mini-Mental State Examination (MMSE) score, 10–26). Among these, 791 individuals (77%) had died by December 31, 2012, and were included in the present study. Patients were evaluated regarding cognitive (MMSE and Alzheimer's Disease Assessment Scale-cognitive subscale (ADAS-cog)) and functional (Instrumental Activities of Daily Living scale (IADL) and Physical Self-Maintenance Scale (PSMS)) abilities, as well as concomitant medications. The date of death was recorded, and survival was compared individually with that of the sex- and age-matched general population.

In Table 1, a t-test was performed to analyze two independent groups, and a $\chi 2$ test was used to analyze categorical variables. One-way analysis of variance (ANOVA) with Bonferroni correction (Figure 1) and a t-test (Figures 2–4) were used to compare the differences between the means. A general linear model was used to determine the participants' characteristics at the start of ChEI treatment that affected independently the time from AD diagnosis to death (Table 2). The following potential predictors were investigated: sex, age, cognitive ability, instrumental and basic ADL, number of medications, and specific concomitant medications (antihypertensive/cardiac therapy, antidiabetic medications, antipsychotic medications, lipid-lowering agents, nonsteroidal anti-inflammatory drugs (NSAIDs)/acetylsalicylic acid, antidepressants, and anxiolytics/sedatives/hypnotics).

Results

Table 1. Baseline characteristics (n = 791)

Female sex	490 (62%)
Antihypertensive/Cardiac therapy	331 (42%)
Antidiabetic therapy	40 (5%)
Antipsychotic therapy	38 (5%)
Lipid-lowering agents	77 (10%)
NSAIDs/acetylsalicylic acid	246 (31%)
Antidepressants	197 (25%)
Anxiolytics/sedatives/hypnotics	113 (14%)
Estimated age at onset, years[a]	73.0 ± 6.8
Estimated duration of AD, years[a]	3.1 ± 2.0
Age at the start of ChEI treatment (baseline), years[a]	76.1 ± 6.4
Education, years[a]	9.4 ± 2.5
MMSE score, range 30–0[a]	21.0 ± 3.8
ADAS-cog score, range 0–70[a]	22.0 ± 9.1
IADL score, range 8–31[a]	16.7 ± 5.4
PSMS score, range 6–30[a]	7.7 ± 2.4
Time from AD diagnosis to death, years[a]	5.7 ± 2.8
Age at death, years[a]	81.8 ± 6.5
Lost years compared with the sex- and age-matched general population[a]	5.3 ± 4.8

[a]Mean ± standard deviation (SD)

AD, Alzheimer's disease; ADAS-cog, Alzheimer's Disease Assessment Scale-cognitive subscale; IADL, Instrumental Activities of Daily Living scale; MMSE, Mini-Mental State Examination; NSAIDs, nonsteroidal anti-inflammatory drugs; PSMS, Physical Self-Maintenance Scale

Table 2. General linear model with time from AD diagnosis to death as the dependent variable and significantly associated predictors

Independent variables	**β**	**β, 95% CI**	***p*-value**
Intercept	9.425	6.784, 12.066	<0.001
Sex (male = 0, female = 1)	0.954	0.569, 1.339	<0.001
Antihypertensive/Cardiac therapy (no = 0, yes = 1)	–0.666	–1.048, –0.285	0.001
Antidiabetics (no = 0, yes = 1)	–1.351	–2.217, –0.486	0.002
Antipsychotics (no = 0, yes = 1)	–0.976	–1.864, –0.088	0.031
Age at first assessment (years)	–0.056	–0.086, –0.026	<0.001
ADAS-cog score at baseline	–0.025	–0.048, –0.002	0.032
IADL score at baseline	–0.065	–0.105, –0.026	0.001

β values were unstandardized and are expressed per 1 unit increase for continuous variables and for the condition present in dichotomous variables.

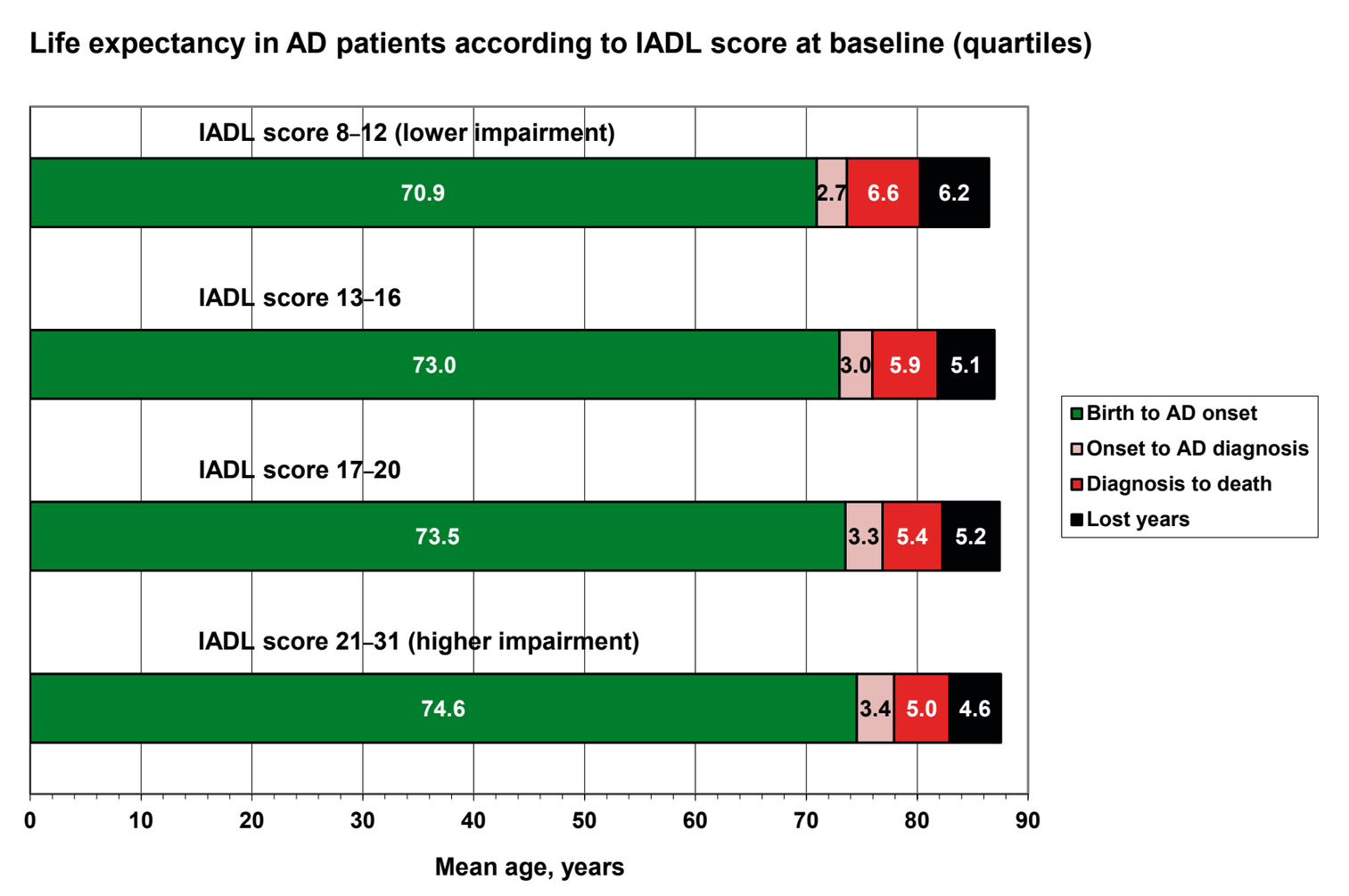
AD, Alzheimer's disease; ADAS-cog, Alzheimer's Disease Assessment Scale-cognitive subscale; CI, confidence interval; IADL, Instrumental Activities of Daily Living scale

IADL score at baseline and antihypertensive/cardiac therapy, antidiabetic medications, and antipsychotic medications were independent predictors of life expectancy after AD diagnosis, after controlling for sex, age, and cognitive ability. Basic ADL ability, number of medications, and specific concomitant medications (lipid-lowering agents, NSAIDs/acetylsalicylic acid, antidepressants, and anxiolytics/sedatives/hypnotics) at baseline were not significant predictors of life expectancy.

Contact address:
Carina Wattmo, RN, BSc, PhD, Clinical Memory Research Unit, Department of Clinical Sciences, Malmö, Lund University, SE-205 02 Malmö, Sweden.
Tel +46 40 33 56 01, Fax +46 40 33 56 57, E mail: carina.wattmo@skane.se

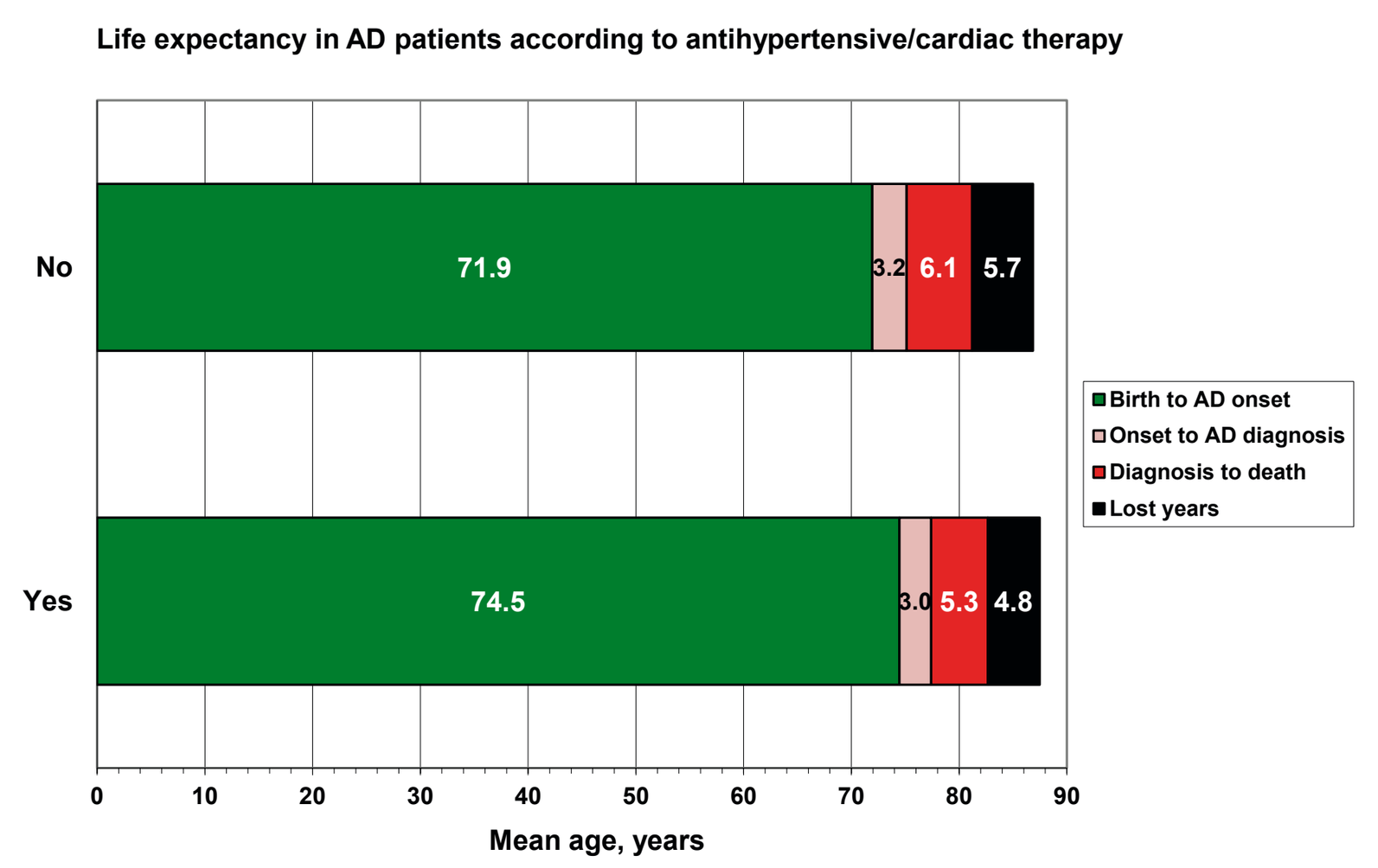
Poster presented at the Alzheimer's Association International Conference, Copenhagen, Denmark; July 12-17, 2014.

Figure 1.



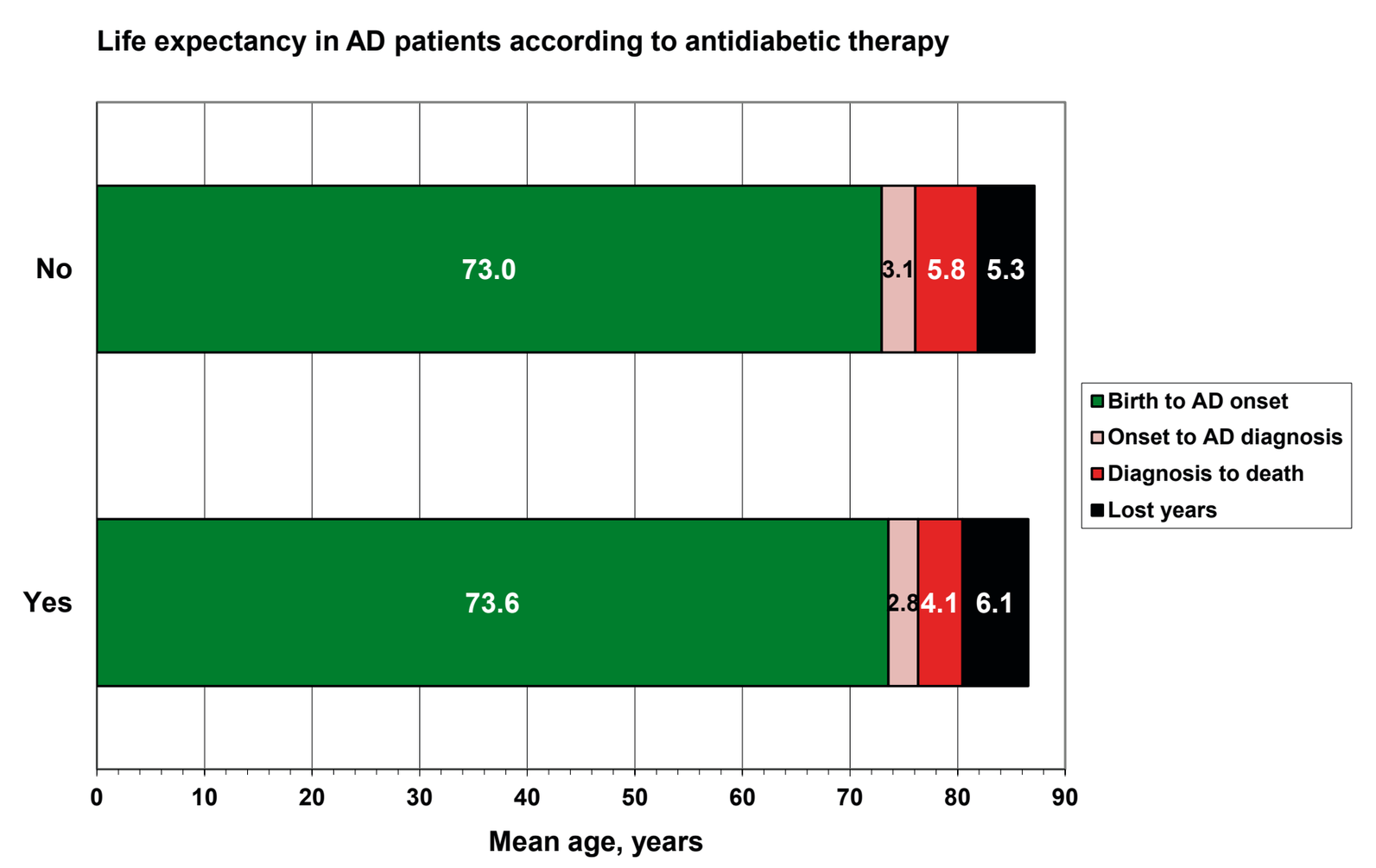
The mean ± SD time from AD diagnosis to death differed among patients with different levels of IADL impairment at baseline divided into quartiles: score of 8–12 (6.6 ± 2.8 years), score of 13–16 (5.9 ± 2.7 years), score of 17–20 (5.4 ± 2.8 years), and score of 21–31 (5.0 ± 2.5 years; p < 0.001). The group with the best preserved IADL capacity was younger at the onset of AD and at the time of diagnosis than were the other groups (p < 0.001) and had a larger reduction in life expectancy compared with the most impaired group (p = 0.006).

Figure 2.



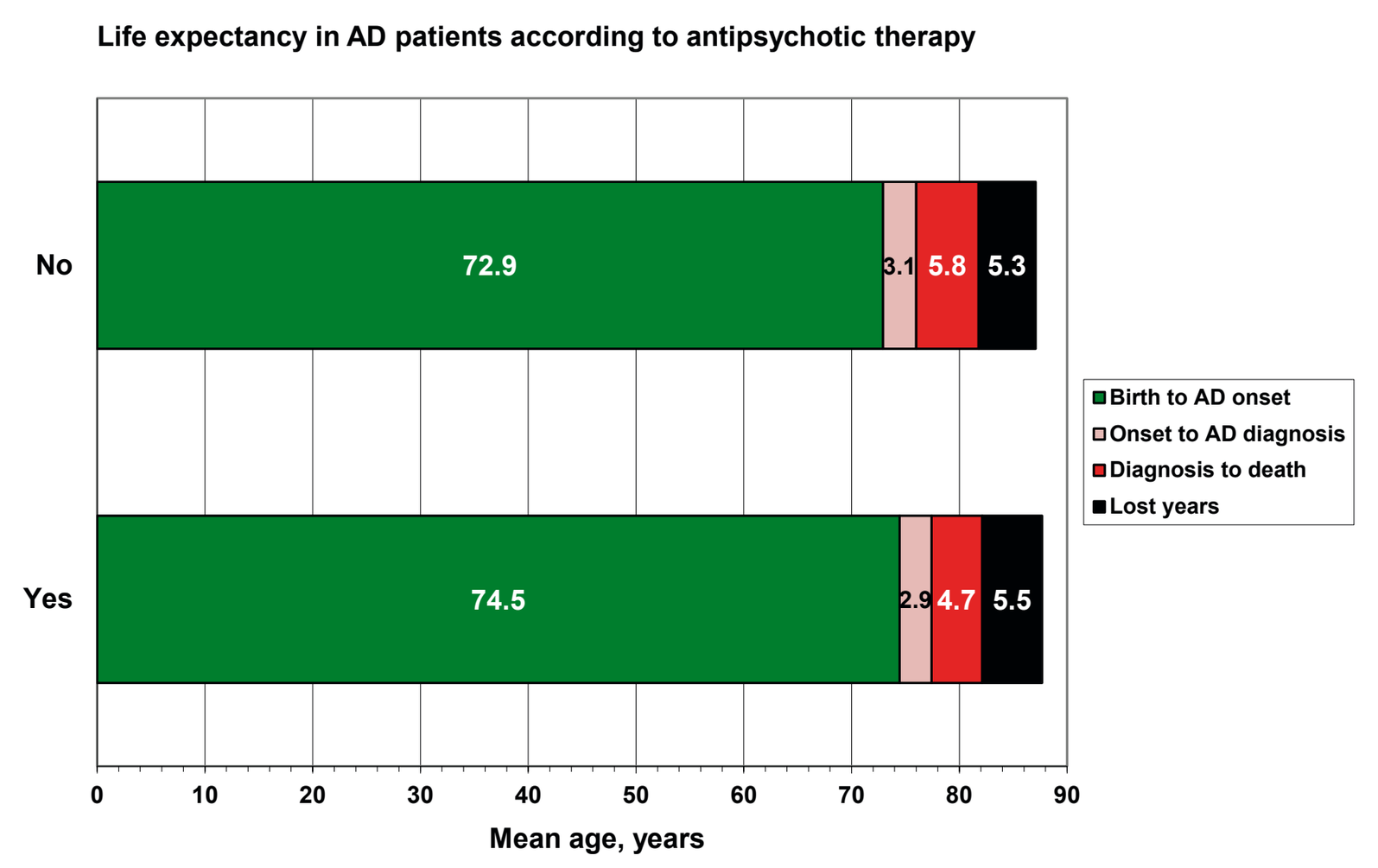
The patients without antihypertensive/cardiac therapy were younger at the onset of AD (mean ± SD; 71.9 ± 7.3 vs 74.5 ± 5.9 years, p < 0.001) and at the time of diagnosis (75.1 ± 6.8 vs 77.4 ± 5.6 years, p < 0.001) compared with the individuals who received these medications. The time from AD diagnosis to death was longer in patients with no antihypertensive/cardiac therapy (6.1 ± 2.7 vs 5.3 ± 2.8 years, p < 0.001).

Figure 3.



The time from AD diagnosis to death was longer in patients with no antidiabetic therapy (mean ± SD; 5.8 ± 2.8 vs 4.1 ± 2.4 years, p < 0.001) compared with the individuals who received these medications. The non-users of antidiabetics died at an older age (81.9 ± 6.6 vs 80.3 ± 4.8 years, p = 0.041) and had less reduction in life expectancy (41% vs 58%, p < 0.001) than did those who received this type of medication. No significant difference in age at onset or age at diagnosis of AD was detected between the groups.

Figure 4.



The time from AD diagnosis to death was longer in patients with no antipsychotic therapy (mean ± SD; 5.8 ± 2.8 vs 4.7 ± 2.5 years, p = 0.020). No significant difference in age at onset or age at diagnosis of AD was detected between the groups.