

Mortality Abstract 210K1**SURVIVAL IN ALZHEIMER'S DISEASE AND VASCULAR DEMENTIAS**

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Reference

Barclay LL, Zemcov A, Blass JP, Sonsone J. Survival in Alzheimer's disease and vascular dementias. *Neurology* 1985; 35:834-840.

Objective of this Abstract

This article was written to compare the mortality in dementia of Alzheimer's type with the vascular dementias. These were defined as multi-infarct dementia type and mixed dementia type.

Patients Studied

All patients were initially evaluated at the Geriatric Evaluation Service Dementia Clinic at the Burke Rehabilitation Center, Cornell University Medical Center. After an initial evaluation, history and physical examination, which included various laboratory tests, the patients were evaluated by various psychometric tests and behavior rating scales (Modified Hachinski Ischemic Score, Haycox Behavioral Score and Blessed, Tomlinson and Roth Behavior Score). The diagnostic groups were based upon the initial evaluation and follow-up data to include autopsy information, if available. Any patient with a treatable cause of dementia or other medical conditions was excluded from this study.

The dementia of Alzheimer's type (DAT) group was defined as patients with a history of progressive, gradual mental impairment of at least six months duration and an impairment in various psychometric tests and behavioral rating scales. The multi-infarct dementia patient group (MID) had similar scores on the psychometric tests and behavioral rating scales; however, the group had several markers for vascular disease. The mixed dementia group (MIX) of patients had features of both the DAT and MID groups, but were noted to have lower scores on the psychometric tests and the behavioral rating scales. A comparison of the significant secondary diagnoses among the subgroups revealed that diabetes was more prevalent in both the MIX and MID subgroups than in the DAT group. Further, the MID and MIX subgroups and significantly more hearing and visual impairment than the DAT group.

The breakdown of clinical characteristics were noted below:

	DAT	MID	MIX
M:F Ratio	1:1.9	1:1	1:1.9
Age (hrs)	73.3± 0.6	75.9±0.8	76.9±1.1
Race			
Caucasian	96.5%	98.5%	97.6%
Black	3.0	1.5	2.4
Oriental	.5	0	0

Follow-Up

Follow-up information was obtained by telephone at six month intervals from the caretakers. Initially, there were three patients lost to follow-up; however, none of the remaining 311 patients were lost to follow-up. The number of follow-up interviews was noted as follows:

1 interview	237 patients (76.2%)
2 interviews	47 patients (15.1%)
3 or more interviews	27 patients (8.7%)

At each interview, the nurse practitioner obtained a new medical history to include any hospitalization, institutionalization, new problems that may have arisen or deaths. A repeat behavior score was obtained at this interview. The range of follow-up was between one month to nearly five years with a mean of nearly two years with a total of 566 patient years of exposure.

Methods

Expected death rates for the table presented have been calculated on an age/sex derivation of the U.S. Population Table 1979-1981. These tables were thought to be suitable due to the characteristics of the pool of patients. Adjustments were made for different mixes of male/female ratios of each of the dementia subgroups. The relatively narrow age spread permitted a yearly progression in the mortality table.

The DAT group as the youngest in the study with a mean age of 73.3 ± 0.6 years with a male to female ratio of 1 to 1.9. Due to this, an age ratio male to female calculation revealed a mean q' value more closely approximating age 72 to 73 of a Total U.S. Population

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Table. Hence, this value was used as the initial starting age for this group.

The MID group was much older with a mean age of 75.9±0.8 years with a male to female ratio of 1 to 1. Due to the large mortality contribution of the males with a higher mean q' value, a calculation of a mean q' most closely approximated age 76 to 77 years of a Total U.S. Population Table.

The MIX group revealed a mean age of 76.9±1.1 years with a male to female ratio again of 1 to 1.9. In calculating the mean q' the value more closely corresponded to age 75 to 76 of the Total U.S. Population Tables.

Results

The authors in the study noted several trends in the dementia groups. All groups demonstrated progressive deterioration of the psychometrics and behavioral scales over time. All of the groups at the follow-up intervals were matched with regard to the living/care accommodations. There was a significant difference in the incidence of hearing/visual impairments and diabetes in the subgroups. The MIX group had the highest rate of hearing/visual impairments and diabetes, while patients in the DAT group had the lowest rates. There were no apparent reasons for this finding.

Autopsy confirmation of the clinical diagnosis of organic brain disease with dementia was noted to be 87.5%; however, this was based upon only 16 autopsies.

The tabular data (page 104) has been arranged to show the data on an annual basis. This data reveals an extremely high mortality of the MID group with a cumulative mortality ratio of 451% versus 272% for the DAT group. There was noted an early, high mortality for the MID group which was not explained by the authors. Survival ratios reveal 54% of the DAT patients survive four years or more after an initial evaluation compared to 10% of the MID patient group. This probably reflects the progression and significant interaction of diabetes and the vascular disease present in the MID group.

Comment

This article was selected due to the availability of the complete patient data in this diagnostic group. Further,

the social significance of the authors' assertion of increasing survival of the DAT group is associated with progressive functional and behavioral decline.

Assumptions

Mortality q'

- Use of U.S. Population Tables 1979-81 con. (State tables unavailable)

q' DAT - By use of the combined U.S. Pop. Table 1979-81 for age 73.3±0.6 was noted as .03882. However, a sex breakdown is noted for the group of M:F ratio of 68:131 or 34% males, 66% females. Hence, the calculation at age 73.3 would be:

Males	.05338 x .34 =	.0181492
Females	.02842 x .66 =	<u>.0187572</u>
for the group		.0369064

This value is closer to age 72-73 in the combined tables or .03593. The age advance would be one year thereafter.

q' MID - The mean age in this group was 75.9±0.8 with a sex breakdown M:F of 35:34. The combined table q' for age 76 is .04507. The contribution of the:

Males	.06167 x .51 =	.03145
Females	.03388 x .49 =	<u>.01660</u>
for the group		.04805

This more closely corresponds to a combined age of 76-77 or .04867. This would be advanced 1 year thereafter.

q' MIX - The mean age in this group was 76.9±1.1 with a M:F ratio of 15:28. The combined table q' for age 76.9 is .04867. The contribution of the:

Males	.06647 x .35 =	.0232645
Females	.03704 x .65 =	<u>.024076</u>
for the group		.04734

This value corresponds to age 75-76 or .04507 on the combined population table. This would be advanced 1 year thereafter.

Table 1

Interval Years	Entrants Living l	Entrants* w/drawn W	Entrants Exposed E	Deaths obs d	Deaths exp ⁺ d'	Mortality Rate obs q	Mortality Rate exp ⁺ q'	Survival Rate obs p	Survival Rate exp p'	MR 100d/d'	EDR
DAT											
1	200	41	180	14	6.48	.078	.036	.9218	.9641	216	42
2	145	53	118	12	4.60	.102	.039	.898	.9612	261	63
3	80	47	56	12	2.35	.214	.042	.7857	.9516	511	172
4	21	8	17	5	0.77	.294	.045	.7059	.9549	649	249
5	8	8	4	0	0.20	0	.049	1.0	.9513	0	-50
MID											
1	70	24	58	6	2.84	.103	.049	.8966	.9513	211	55
2	40	14	33	9	1.75	.273	.053	.7273	.9473	514	220
3	17	5	14	3	.80	.750	.057	.2500	.9426	375	157
4	9	2	8	4	.50	.500	.063	.5000	.9372	800	438
MIX											
1	44	10	39	7	1.76	.180	.045	.8205	.9549	398	134
2	27	10	22	3	1.08	.136	.049	.866	.9513	278	87
3	14	4	12	1	.64	.083	.053	.9167	.9473	156	30
4	9	2	8	0	.46	0	.057	1.0	.9426	0	-58

* Distribute "lost to follow-up" entrants over the three sub groups DAT, MID, MIX.

⁺ See Assumptions, page 103.

Table 2

Interval Year	Cum. P	Survival Rate P'	Cum. Q	Mortality Rate Q'	Survival Ratio SR
DAT					
1	.9218	.9641	.0782	.0359	95.6
2	.8279	.9267	.1721	.0733	89.3
3	.6505	.8818	.3495	.1182	73.8
4	.4592	.8421	.5408	.1579	54.5
5	.4592	.8011	.5408	.1989	57.3
MID					
1	.8966	.9513	.1034	.0487	94.2
2	.6521	.9012	.3479	.0988	72.4
3	.1630	.8494	.8370	.1506	19.2
4	.0815	.7961	.9185	.2039	10.2
MIX					
1	.8205	.9549	.1795	.0451	85.9
2	.7086	.9084	.2914	.0916	78.0
3	.6496	.8605	.3504	.1395	75.5
4	.6496	.8111	.3504	.1889	80.1