CLINICAL CHARACTERISTICS AND SURVIVAL OUTCOMES IN WALDENSTRÖM MACROGLOBULINEMIA: AN UPDATED ANALYSIS OF 10574 PATIENTS FROM THE SEER DATABASE (1975–2020)

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INTRODUCTION

Waldenström macroglobulinemia (WM) is a rare, indolent B-cell lymphoproliferative disorder characterized by the presence of a monoclonal IgM protein and bone marrow infiltration by lymphoplasmacytic cells. This updated study utilized SEER database **aim** to define the demographic profile of WM and evaluate the impact of clinical and socioeconomic variables on overall survival

METHOD

Data were extracted from the SEER 8, 12, and 17 registries (1975–2020). From an initial 14390 cases, patients were excluded for unknown race (n=145), nonprimary malignancy (n=3065), reporting via death certificate or autopsy only (n=97), or a lack of microscopic confirmation (n=509). The final analytic cohort comprised 10574 patients with WM. Statistical analysis included descriptive characterization and univariate Cox regression to determine the HRs based on demographic, socioeconomic, and clinicopathological variables.

RESULTS

The study population was predominantly White (89.2%, n=9430), male (58.6%, n=6201), and aged ≥60 years (79.0%, n=8358). Univariate Cox regression identified several significant predictors of mortality. Age older than 60 years was the strongest risk factor (HR, 2.97; P<0.001), while female sex (HR, 0.87; P<0.001) and diagnosis after 2006 (HR, 0.55; P<0.001) were associated with improved survival. Advanced diagnostic confirmation (including immunophenotyping or genetic studies) was associated with improved survival compared with histology alone (HR, 0.67; P<0.001). Conversely, Ann Arbor stages II (HR, 1.60), III (HR, 1.94), and IV (HR, 1.39) all carried a significantly higher mortality risk than stage 1 (P<0.001). Notably, race was not a significant predictor of mortality (P=0.988). The primary causes of death were plasma cell neoplasms and immunoproliferative diseases (20.5%, n=1141), non-Hodgkin lymphomas (20.2%, n=1127), and cardiovascular disease (9.4%, n=522).

CONCLUSIONS

This is one of the largest and updated studies of WM to demonstrate a significant evolution in survival outcomes over four decades. The findings show that advanced clinical stages (II–IV) have a significantly higher mortality risk than stage I, establishing Ann Arbor staging as an important prognostic tool.

TABLES AND FIGURES

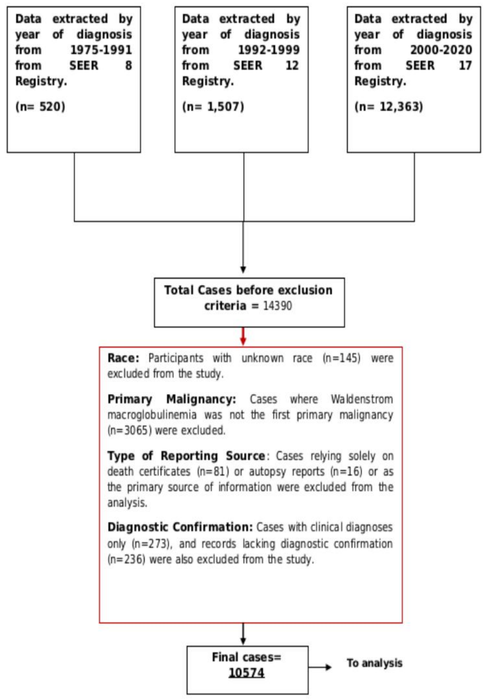

Figure 1: flow chart of the exclusion criteria

Table 1: Clinicopathological variables of WM patients

Variables		N	%
Age	Less than 60 years	2216	21.0%
	Older than 60 years	8358	79.0%
sex	Male	6201	58.6%
	Female	4373	41.4%
Race	White	9430	89.2%
	Non-white	1144	10.8%
Year of Diagnosis	Before 1991	374	3.5%
	1991-2006	3879	36.7%
	After 2006	6321	59.8%
Type of reporting	Hospital inpatient/outpatient or clinic	9690	91.6%
	Other	884	8.4%
Diagnostic Conformation	Positive histology	8439	79.8%
	histology AND immunophenotyping AND/OR pos genetic studies	1668	15.8%
	Other	467	4.4%
Median household income inflation adjusted to 2021	less than $75,000	4969	48.4%
	More than $75,000	5295	51.6%
Radiation	Beam radiation	348	3.3%
	None/unknown and other	10226	96.7%
Surgery	Surgery performed	543	5.1%
	Not recommended	9456	89.4%
	Recommended	507	4.8%
	Unknown	68	0.6%
Chemotherapy	Yes	4879	46.1%
	No/unknown	5695	53.9%
Vital status	Live	4999	47.3%
	Dead	5575	52.7%
Ann arbor stage	Stage I	376	3.6%
	Stage II	154	1.5%
	Stage III	173	1.6%
	Stage IV	2412	22.8%
	Unknown	7459	70.5%

Table 2: Univariate Cox regression analysis of the prognostic factors for WN patients

Variables	HR (95% CI, P-value)
Age	
Less than 60 years (Reference)	
Older than 60 years	2.97 (2.75-3.21, p<0.001)
Sex	
Male (Reference)	
Female	0.87 (0.83-0.92, p<0.001)
Race	
White (Reference)	
Non-white	1.00 (0.92-1.09, p=0.988)
Year of Diagnosis	
Before 1991 (Reference)	
1991-2006	0.76 (0.68-0.85, p<0.001)
After 2006	0.55 (0.49-0.62, p<0.001)
Type of reporting	
Hospital inpatient/outpatient or clinic (Reference)	
Other	0.96 (0.88-1.06, p=0.452)
Diagnostic confirmation	
Positive histology (Reference)	
Pos hist AND immunophenotyping AND/OR pos genetic studies	0.67 (0.60-0.75, p<0.001)
Other	1.11 (0.98-1.25, p=0.089)
Median household income inflation adjusted to 2021	
less than $75,000 (Reference)	
More than $75,000	0.94 (0.90-0.97, p=0.001)
Radiation	
Beam Radiation (Reference)	
None/unknown and other	1.09 (0.99-1.19, p=0.085)
surgery	
Surgery performed (Reference)	
Not recommended	0.92 (0.84-1.01, p=0.094)
Recommended	1.69 (1.40-2.04, p<0.001)
Unknown	1.10 (0.95-1.28, p=0.202)
Chemotherapy	
Yes (Reference)	
No/unknown	0.89 (0.86-0.93, p<0.001)
Ann arbor stage	
Stage I (Reference)	
Stage II	1.60 (1.28-2.01, p<0.001)
Stage III	1.94 (1.56-2.40, p<0.001)
Stage IV	1.39 (1.21-1.60, p<0.001)
Unknown	1.23 (1.08-1.40, p=0.002)

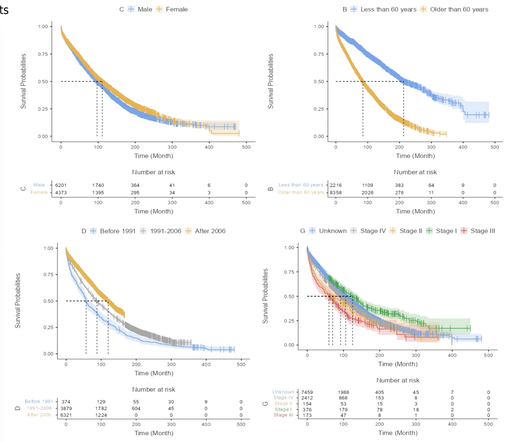

Figure 2: This figure shows four Kaplan-Meier survival curves of patients with WM stratied according to sex, age, year of diagnosis and Ann arbor stage

Table 3: Cause of death

Cause of Death	Count	%
Ischemic heart and hypertensive diseases	522	9.4%
Non-Hodgkin lymphomas	1127	20.2%
Other and unspecific disorders of circulatory system	293	5.3%
Plasma Cell Neoplasms and Immunoproliferative Diseases	1141	20.5%
Chronic obstructive pulmonary disease and allied conditions	172	3.1%
cerebrovascular diseases	157	2.8%
Lung, Bronchus and (pneumonia or influenza)	290	5.2%
Alzheimer	93	1.7%
Accidents and adverse effects	83	1.5%
Other infectious and parasitic diseases including HIV	99	1.8%
Others causes of death	1598	28.7%

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