

Trends in survival, hospitalization and cause of death in Multiple Myeloma: An analysis of the Cancer Registry NRW

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Introduction

For Multiple Myeloma (MM), the therapeutic tool kit has improved over the past decades. For Germany, up-to-date survival data on the population level are sparse.

Methods

Age-standardized and age group specific relative survival (RS) rates were estimated for consecutive time periods and the cause of death was analyzed using data from the Cancer Registry of North Rhine-Westphalia (NRW). From 1993 to 2007, the cancer registry covered a subset of the NRW population, the administrative district of Münster (MS). Since 2008, due to new legislation, data are available for the whole federal state. MM cases were retrieved from the MS and NRW cohorts for time periods 1995-2019 and 2010-2019, respectively. Cases that were notified by death certificate only (DCO) were excluded from the survival analysis. Survival analysis was restricted to patients aged <75 at diagnosis, as the proportion of DCO-cases increased with age, leading to overestimation of survival in older age groups. Data on hospitalization were retrieved from the Federal State Office. Five-year RS was calculated to estimate cancer net-survival using the period approach.

Results

From the MS and NRW cohorts, 2,633 and 7,268 cases were included, respectively. The proportions of DCO-cases that had to be excluded were 7% and 11%, respectively. Average age-standardized incidence rates (ASR) in the NRW cohort from 2010 to 2019 were 6.1/100,000 for men and 3.9/100,000 for women. Since 2000, survival has improved in all age groups. In the MS cohort RS improved from 41% (95%-CI, 36-45%) in period 2000-2004 to 67% (95%-CI, 63-72%) in 2015-2019. In recent years comparing periods 2010-2014 and 2015-2019 (NRW cohort), RS improved from 68% (95%-CI, 63-72%) to 72% (95%-CI, 70-74%) in the age group 15-64 yrs and from 54% (95%-CI, 49-60%) to 57% (95%-CI, 55-60%) in the age group 65-74 yrs. Major causes of non-myeloma death in recent years were second primary cancers and cardiovascular diseases. Hospitalization rates decreased from 2000 to 2019, with an average annual percentage change of ASR of -2.5% (95%-CI, -3.2 to -1.7).

Discussion

We observed improvement of relative survival for patients with MM between 2000-2019. In the same time, hospitalization rates decreased, suggesting that gain in life years is not accompanied by increased morbidity. Therapeutic advances might have been crucial. With improving survival, increased attention should be paid to second primary cancers and cardiovascular events.

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Table 1 Patient characteristics

	NRW 2010-2019 15-74 years		Administrative district of Münster 1995-2019 15-74 years	
	Men	Women	Men	Women
Person years at risk (million)	67.2	67.8	24.7	24.8
Cases				
Including DCO	4789	3381	1607	1208
Study population for survival analysis (excl. DCO)	4248	3020	1507	1126
Age at diagnosis, excl. DCO (%)				
Median (years)	64	64	65	65
15-64	2250 (53)	1516 (50)	738 (49)	530 (47)
65-74	1998 (47)	1504 (50)	769 (51)	596 (53)
Diagnosis, excl. DCO (%)				
Multiple Myeloma (C90.0)	4130 (97)	2950 (98)	1438 (95)	1088 (97)
Plasma cell leukemia (C90.1)	23 (0.5)	25 (0.8)	9 (0.6)	8 (0.7)
Extramedullary plasmocytoma (C90.2)	95 (2)	45 (1)	60 (4)	30 (3)

Table 2 Relative survival estimates

Calendar period	NRW 5-year relative survival (%)		Administrative district of Münster 5-year relative survival (%)			
	2010-2014	2015-2019	2000-2004	2005-2009	2010-2014	2015-2019
Men						
Total (15-74 yrs) *	60.7 (55.8-65.5)	65.9 (63.7-68.1)	37.9 (31.5-44.4)	53.8 (47.1-60.4)	60.8 (54.8-66.9)	66.1 (60.5-71.7)
15-64 yrs	65.3 (59.7-70.9)	69.4 (66.5-72.3)	40.8 (32.4-49.3)	61.4 (52.4-70.4)	63.0 (54.7-71.2)	70.7 (63.1-78.3)
65-74 yrs	52.6 (45.0-60.2)	58.4 (54.9-62.0)	33.3 (24.3-42.2)	40.2 (30.5-50.0)	57.1 (48.1-66.1)	56.3 (47.5-65.0)
Women						
Total (15-74 yrs) *	66.2 (61.4-70.9)	68.3 (65.8-70.8)	43.5 (36.8-50.2)	56.1 (48.5-63.6)	63.2 (57.0-69.5)	69.2 (62.6-75.9)
15-64 yrs	71.1 (64.4-77.9)	75.9 (72.7-79.1)	50.1 (39.8-60.5)	64.5 (54.4-74.5)	69.9 (60.7-79.1)	76.8 (68.6-84.9)
65-74 yrs	56.4 (49.1-63.7)	55.5 (51.7-59.4)	27.5 (18.6-36.4)	44.2 (33.9-54.5)	51.3 (42.3-60.3)	56.0 (45.4-66.5)
Both						
Total (15-74 yrs) *	62.9 (59.4-66.4)	66.8 (65.2-68.5)	40.5 (35.7-45.2)	54.7 (49.7-59.8)	61.9 (57.5-66.3)	67.3 (63.0-71.6)
15-64 yrs	67.5 (63.2-71.9)	72.1 (69.9-74.2)	44.5 (37.9-51.1)	62.7 (56.0-69.4)	65.8 (59.7-72.0)	73.4 (67.8-78.9)
65-74 yrs	54.4 (49.1-59.7)	57.2 (54.5-59.8)	30.4 (24.1-36.8)	42.0 (34.9-49.1)	54.1 (47.7-60.5)	56.2 (49.4-63.0)

* age-standardized

Figure 1 Relative survival trends in myeloma patients (Administrative district of Münster)

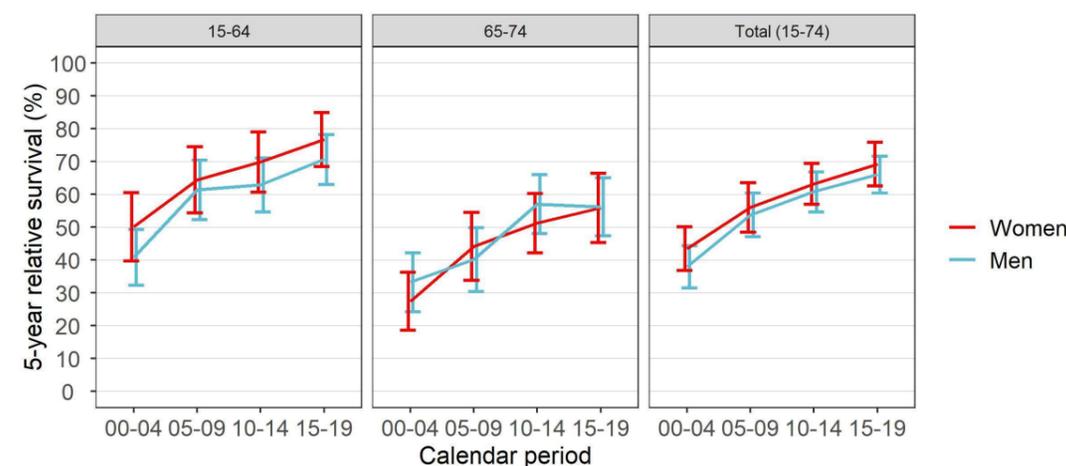


Figure 2 Hospitalization for myeloma in NRW (main diagnosis at discharge)

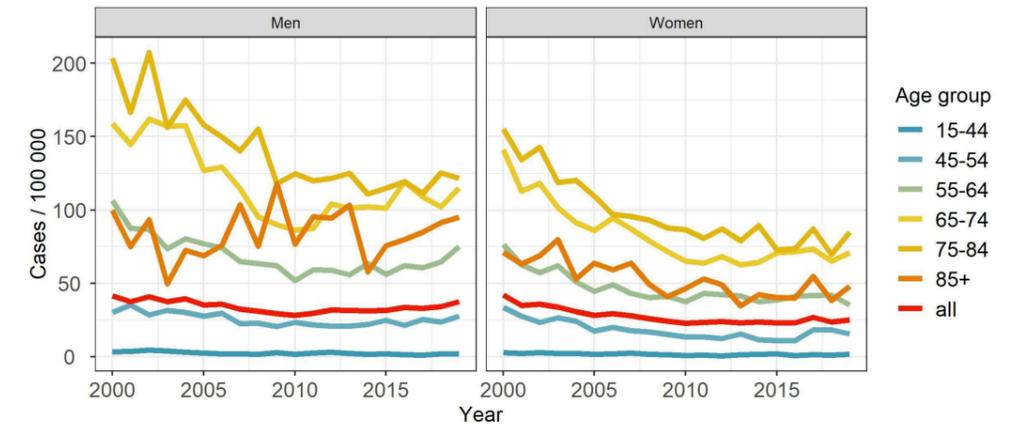


Table 3 Causes of death in myeloma patients in NRW, diagnosis 2010-2019

Cause of death (ICD-10)	Observed No. of deaths (%)
Multiple myeloma and plasma cell neoplasms (C90)	6644 (77.1)
Cardio-vascular diseases (I00-I99)	602 (7.0)
Non-myeloma cancer (C00-D48, excl. C90)	498 (5.8)
Respiratory diseases (J00-J99)	161 (1.9)
Diseases of the genitourinary system (N00-N99)	95 (1.1)
Certain infectious and parasitic diseases (A00-B99)	90 (1.0)
Endocrine, nutritional and metabolic diseases (E00-E90)	71 (0.8)
Gastrointestinal diseases (K00-K93)	66 (0.8)
Mental and behavioural disorders (F00-F99)	30 (0.3)
Diseases of the nervous system and sensory organs (G00-H95)	25 (0.3)
Non-informative causes of death (R00-R94, R95-R99)	99 (1.1)
NA	134 (1.6)