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Real-world observations on the evolving treatment landscape and improved survival outcomes for myeloma patients in Finland

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INTRODUCTION

Rapid advancements have been seen in the management of multiple myeloma (MM) in the recent decade. Despite this, there is limited evidence on how treatment has changed in real world, and how these changes have impacted overall survival (OS).

AIM

Our study aimed to investigate real-world treatment patterns and outcomes of MM patients in Finland.

METHOD

Retrospective analysis of patients with MM *diagnosed between 2013 and 2022* in Finland

Data collection:

Data permit was granted by **the Finnish Social and Health Data Permit Authority Findata** *(permit number THL/5224/14.02.00/2021)*

- **Cohort was formed of treated MM patients from four Finnish hospital districts:** Helsinki and Uusimaa, Southwest Finland, Pirkanmaa and Northern Savo, covering approx. ***3 million population***.

The following data was collected for this cohort:

- Diagnoses, laboratory values, and hospital-based treatments were collected from the respective hospital data lakes
- Data on drug purchases reimbursed by the Social Insurance Institution
- Two age, sex and home municipality matched controls were collected for each MM patient ***by the Digital and Population Services Agency***
- Finally, data from different registries was linked using the Finnish social security number.

Analyses:

Patients were categorized into two groups:

- Those with stem cell transplantation (***SCT group***) and those without (***non-SCT group***)

Cohorts were divided based on year of diagnosis:

- **2013-2017** and **2018-2022**

OS was defined as time from MM diagnosis until death *(event)* or ***Dec 31, 2022*** *(censoring)*

RESULTS

Study Population (Table 1):

1,733 patients with MM treatment

- **SCT Group:** ***512* patients**, average age ***60.5* years** *(SD: 8.4)*
- **Non-SCT Group:** *1,221* patients, average age *73.9* years *(SD: 9.4)*

Evolvement of treatment landscape (Table 2):

- Use of lenalidomide during SCT-treatment has increased ***from 50 % to 90 %***
- Increased use of carfilzomib, pomalidomide, and daratumumab, especially in SCT patients.
- Increased use of ixazomib and pomalidomide for non-SCT patients

Overall Survival (OS, Figures 1, 2 and 3):

SCT 4-year survival

- **2013-2017: *81.7 %*** *(95 % CI: 76.4, 86.0)*
- **2018-2022: *93.0 %*** *(95 % CI: 87.0, 96.3)*
- ***p-value 0.006*** between time periods
- **Hazard Ratio (HR):** SCT patients diagnosed in ***2018-2022*** had an HR of 0.44 *(95 % CI: 0.24, 0.79)* compared to those diagnosed in ***2013-2017***

Non-SCT mOS

- **2013-2017: 41.3 months** *(95% CI: 38.1, 45.6)*
- **2018-2022: 43.8 months** *(95% CI: 39.8, 55.3)*
- ***p-value 0.31*** between time periods

5-year survival of MM and age, sex and home municipality matched controls:

- **Patients with MM: *51 %*** *(95% CI: 48-54)*
- **Control: *85 %*** *(95% CI: 84-87)*

Table 1. Characteristics of MM cohorts at diagnosis

		Overall	SCT				non-SCT				Missing %
MM Diagnosis year		2013-2022	2013-2022	2013-2017	2018-2022	p-value*	2013-2022	2013-2017	2018-2022	p-value*	
N		1733	512	252	260		1221	577	644		
Age, years, mean (SD)		70 (11)	61 (8)	60.0 (8)	61 (9)	0.20	74 (9)	73 (9)	74 (9)	0.12	0
Sex, female, N (%)		834 (48)	241 (47)	128 (52)	113 (44)	0.12	593 (49)	279 (48)	314 (49)	0.93	0
MM type	IgG	731 (54)	240 (55)	120 (57)	120 (53)	0.81	491 (53)	203 (49)	288 (56)	0.08	22
	IgA	292 (22)	88 (20)	41 (30)	47 (21)		204 (22)	92 (22)	112 (23)		
	IgD	21 (2)	10 (2)	<5	<10		11 (1)	<10	<5		
	IgM	16 (1)	0 (0)	0 (0)	0 (0)		16 (2)	9 (2)	7 (1)		
	light chain	300 (22)	97 (22)	44 (21)	53 (24)		203 (22)	100 (24)	103 (20)		
ISS	I	224 (17)	118 (25)	66 (29)	52 (22)	0.15	106 (12)	43 (11)	63 (13)	0.62	22
	II	602 (44)	212 (46)	95 (42)	117 (49)		390 (44)	178 (45)	212 (43)		
	III	530 (39)	135 (29)	66 (29)	69 (29)		395 (44)	172 (44)	223 (45)		
High risk cytogenetic changes, N (%)#		224 (23)	95 (26)	40 (23)	55 (28)	0.41	129 (21)	57 (22)	72 (20)	0.70	43
Length of the follow-up, months, mean (SD)		39 (30)	54 (29)	74 (27)	34 (15)	<0.001	33 (28)	46 (32)	22 (17)	<0.001	0

*p-value for difference between patients diagnosed between 2013-2017 and 2018-2022. Chi-squared test for categorical variables and t-test for continuous variables. #High risk cytogenetic changes: del(17p), t(4,14), and t(14;16). Cytogenetic changes are missing from Hospital District of Northern Savo.

Table 2. Trends in usage of MM drugs in SCT and non-SCT patients diagnosed during 2013-2017 and 2018-2022

	Treatment number/line*	Total N per LOT		Bortezomib		Carfilzomib		Ixazomib		Lenalidomide		Pomalidomide		Daratumumab		Isatuximab	
		2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022	2013-2017	2018-2022
SCT, N (%)*	SCT	252	260	240 (95)	234 (90)	19 (8)	64 (25)	<5	23 (9)	126 (50)	234 (90)	<5	<5	<5	5 (2)	0 (0)	<5
	1	177	59	51 (29)	5 (9)	35 (20)	17 (29)	5 (3)	7 (12)	138 (78)	34 (58)	<5	9 (15)	13 (7)	14 (24)	0 (0)	5 (9)
	2	115	21	28 (24)	<5	23 (20)	6 (29)	19 (17)	<5	44 (38)	7 (33)	35 (30)	12 (57)	22 (19)	6 (29)	<5	<5
	3	67	8	5 (8)	0 (0.0)	20 (30)	<5	11 (16)	<5	22 (33)	<5	25 (37)	<5	8 (12)	<5	<5	<5
non-SCT, N (%)	1	577	644	386 (67)	438 (68)	0 (0.0)	<5	0 (0.0)	<5	66 (11)	219 (34)	0 (0.0)	<5	0 (0.0)	<5	0 (0)	<5
	2	349	301	104 (30)	90 (30)	7 (2)	27 (9)	7 (2)	12 (4)	202 (58)	206 (68)	<5	18 (6)	<5	7 (2)	0 (0)	6 (2)
	3	207	100	59 (29)	19 (19)	20 (10)	12 (12)	15 (7)	16 (16)	112 (54)	46 (46)	19 (9)	24 (24)	<5	7 (7)	<5	<5
	4	105	33	21 (20)	6 (18)	17 (16)	7 (21)	8 (7)	7 (21)	39 (37)	6 (18)	23 (22)	19 (58)	<5	0 (0)	0 (0)	<5

***Treatment lines were defined accoring to Rajkumar SV, et al.** Guidelines for determination of the number of prior lines of therapy in multiple myeloma. Blood. 2015.*
#For patients with SCT, the first treatment, named "SCT", consists of all inductions before the first SCT, SCT, and possible consolidation and maintenance therapies. Treatment after this, named "1", corresponds thus roughly to treatment of first relapse.

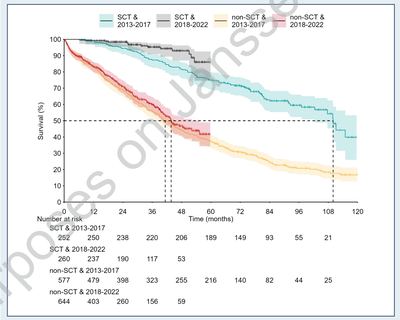

Figure 1.
*OS of SCT and non-SCT patients diagnosed during 2013-2017 and 2018-2022. Shaded areas represent **95 %** CI. No direct comparison between SCT and non-SCT patients should be made due to significant differences between the groups.*

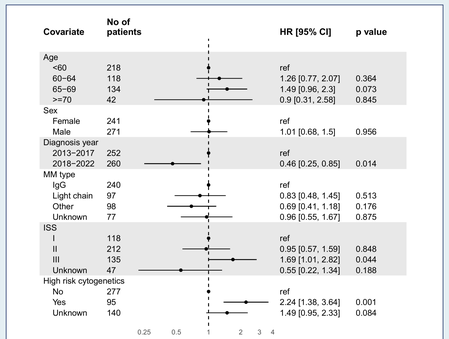

Figure 2.
Cox proportional hazards model of OS for SCT patients

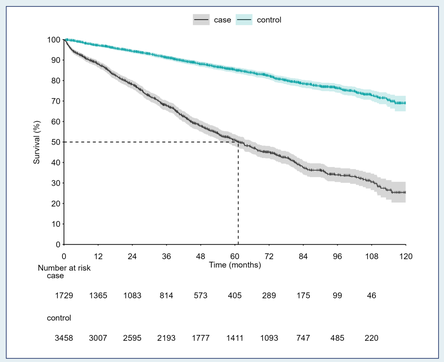

Figure 3.
*OS among MM patients and controls, matched by age, sex and home municipality. Shaded areas represent **95 %** CI.*

CONCLUSIONS

In the Finnish myeloma treatment landscape lenalidomide use has increased in the whole front line setting with notable coverage especially in the SCT population.

Carfiltzomib use has increased in SCT population while use of pomalidomide has increased in relapsed setting within both patient groups.

Ixazomib has modestly been used across patient groups while use of anti-CD38 therapies show signal of increased use only in relapsed SCT-patients.

Proportion of SCT-receiving patients has remained stable ***from 2013-2017 to 2018-2022.***

Survival Trends:

A remarkable increase in OS is seen for SCT, but not non-SCT patients

Absence of significant OS advancement in non-SCT patients highlights the need to further optimize MM treatment strategies

Research Implications:

Continued investigation is essential to enhance MM treatment efficacy and survival of MM patients

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