# Attrition rates in multiple myeloma: A Canadian Myeloma Research Group Analysis

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## INTRODUCTION

-Most patients with MM receive 1st line treatment but reported attrition rates for subsequent lines are high

-Understanding of attrition rates and characteristics of patients who do not receive additional therapy is relevant to MM stakeholders

- Studies using administrative data may overestimate attrition as it can be challenging to distinguish 'true attrition' (defined as patients who do not receive a subsequent line of therapy due to death or those who are alive with progressive MM) from 'perceived attrition' (defined as those who do not receive 2nd line therapy due to death, planned fixed-duration initial therapy and ongoing response, or ongoing 1st line therapy)

-We therefore performed analysis of attrition rates in a large disease-specific database

## OBJECTIVES

1) Evaluate attrition at each line of therapy
2) Identify factors associated with attrition at each line of therapy

## METHODS

-The Canadian Myeloma Research Group Database (CMRG-DB) is a prospectively maintained disease-specific database with >8600 patients from 15 academic sites across Canada with legacy data from 2007

-Consecutive patients with newly diagnosed MM who received at least one line of therapy between Jan 1, 2010-Dec 31, 2020 were included

-Attrition was defined as failure to receive a subsequent line of therapy due to death or despite progression of MM

-The attrition rate was calculated and evaluated at each line of therapy and stratified by two-time cohorts, (2010-2015, 2016-2020), and two treatment cohorts: transplant eligible (ASCT), and transplant ineligible (non-ASCT). Multivariable logistic regression was used to assess factors associated with attrition at each line of therapy

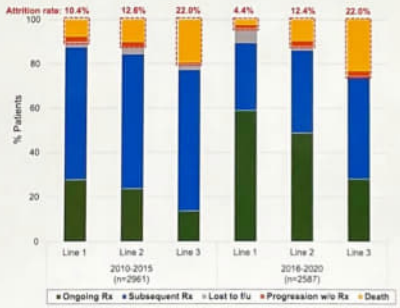
## RESULTS

Table 1: Baseline Characteristics

| Baseline Characteristics | 2010-2015 (n=2961) | | 2016-2020 (n=2587) | | Total (N=5548) |
|---|---|---|---|---|---|
| | ASCT (n=1721) | Non-ASCT (n=1240) | ASCT (n=1390) | Non-ASCT (n=1197) | |
| **Age, median (range) at therapy initiation** | | | | | |
| Line 1 | 58 (29-77) | 71 (35-98) | 60 (26-75) | 74 (33-99) | 65 (26-99) |
| Line 2 | 61 (31-78) | 74 (35-102) | 61 (26-76) | 75 (35-95) | 68 (26-102) |
| Line 3 | 62 (34-82) | 75 (36-97) | 61 (29-77) | 75 (36-96) | 68 (34-97) |
| Line 4 | 62 (36-78) | 75 (40-89) | 61 (40-74) | 74 (37-88) | 67 (36-89) |
| **MM Subtype at diagnosis, n (%)** | | | | | |
| IgG | 1008 (58.6) | 743 (59.9) | 852 (61.3) | 712 (59.5) | 1315 (59.8) |
| IgA | 348 (20.2) | 256 (20.7) | 280 (20.1) | 260 (21.7) | 1144 (20.6) |
| IgM | 5 (0.3) | 9 (10.5) | 1 (0.1) | 10 (12.2) | 25 (1.0) |
| FLC | 216 (12.6) | 130 (10.5) | 183 (13.2) | 146 (12.2) | 675 (12.2) |
| **ISS Stage, n (%)** | | | | | |
| I | 483 (32.5) | 196 (19.3) | 414 (35.0) | 193 (18.9) | 1286 (27.3) |
| II | 537 (36.1) | 366 (38.0) | 426 (36.0) | 362 (35.4) | 1711 (36.3) |
| III | 468 (31.5) | 434 (42.7) | 344 (29.1) | 468 (45.8) | 1714 (36.4) |
| Missing | 233 | 224 | 206 | 174 | 837 |
| **Cytogenetics at diagnosis (t(4;14) or t(14;16) or del(17p, n (%)*** | | | | | |
| High Risk | 303 (33.7) | 151 (28.7) | 284 (36.4) | 170 (27.9) | 908 (32.2) |
| Standard Risk | 596 (66.3) | 376 (71.3) | 496 (63.6) | 440 (72.1) | 1908 (67.8) |
| Missing | 822 | 713 | 610 | 587 | 2732 |
| **Lab Values at diagnosis, median (range)** | | | | | |
| LDH, U/L | 173 (39-1862) | 185 (57-1866) | 173 (66-1278) | 177 (53-2899) | 176 (39-2899) |
| Creatinine umol/L | 88 (23-2705) | 99 (29-1890) | 87 (20-1599) | 99 (37-2920) | 92 (20-2920) |
| Calcium, mmol/L | 2.4 (1.6-5.7) | 2.4 (1.5-4.3) | 2.4 (1.2-6.4) | 2.4 (1.2-23) | 2.4 (1.2-23) |
| B2 microglobulin, nmol/L | 308 (42-4915) | 385 (58-8142) | 297 (51-15847) | 421 (93-8126) | 347(42-15847) |

*Percentages calculated based on number of evaluable patients

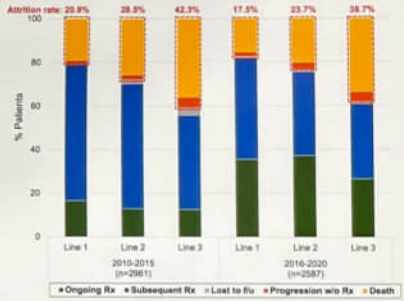
Figure 1: Attrition rates by LOT, ASCT cohort




- Attrition rates increase with each line of therapy and are predominantly driven by death
- Attrition is higher in ASCT-ineligible patients all lines of therapy, maintaining statistical significance across cohorts

## RESULTS

Figure 2: Attrition rate by LOT, Non-ASCT patients




- Multivariable analysis identified older age, shorter time to progression, and inferior response rates as independent risk factors for attrition.

## CONCLUSIONS

-In this observational study using a large MM-specific database, we show that attrition rates are appreciably lower than what has been previously reported

-Death accounted for the vast majority of patients lost to attrition, with most patients not receiving subsequent therapy due to continuation of their previous therapy and/or ongoing remission

- Our data revises the previous definition of attrition, and our demonstration that the majority of patient with MM go on to 2nd, 3rd and even 4th line therapy may be of utility to MM stakeholders

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