Myeloma in Northland 2016-2017

Incidence, risk factors and outcomes

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Introduction

Australasia has the highest reported incidence of myeloma worldwide[1] and specifically, in New Zealand, the estimated incidence rates in 2016 was 8.6 cases per 100,000 person-years[2]. The possible factors that explain the geographical variation in myeloma incidence and relative high rates in Australasia are poorly understood.

Here, we present the analysis of new myeloma cases in Northland; the northernmost region in New Zealand. Northland has significant heterogenicity in its population and thus provided scope to investigate the possible impact of several epidemiological factors on myeloma incidence and outcomes

Methods

We performed retrospective data collection on patient and disease characteristics of all new multiple myeloma cases presenting to Northland Haematology service between January 2016 and December 2017 using electronic health records. Follow up data was collected up until February 2019, in particular focussing on two outcomes; progression free survival and treatment toxicity. Population figures were based on 2016 estimates derived from 2013 census data[3].

Results

Incidence

- Within the two-year study period, 51 new cases of myeloma were observed with a crude incidence of 14.9 cases per 100,000 person-years.
- Adjusting for age of our cohort compared to the national NZ population, the calculated age-standardised incidence was 13.6 per 100,000 person-years.

Demographics

- Median age at diagnosis was 67 years (range 42-86); 56.1% being male.
- BMI, ethnicity and social-economic decile in our cohort were not statistically different from the census population for the region[3].
- There was no difference in incidence between rural and urban areas and no geographical hotspots were identified.

Disease Characteristics

- 6 patients had documented prior MGUS.
- 43 patients required treatment at diagnosis.
- Myeloma subtype is illustrated in *Fig. 1*.
- R-ISS score (*Fig. 2*) and cytogenetic analysis of our cohort at presentation, was comparable to that described in the international literature[4,5].
- 14 patients (32.5%) presented with an emergency admission to hospital as compared with rates in the literature of 28 to 37%[6,7].
- Those from a lower socio-economic decile (6-10) more likely to present as an emergency compared to those from higher decile (1-5) with an odds ratio of 8.8 (p=0.022, CI 0.90- 86.6).

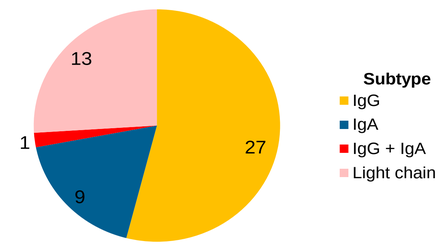

Fig 1. Myeloma classification in Northland

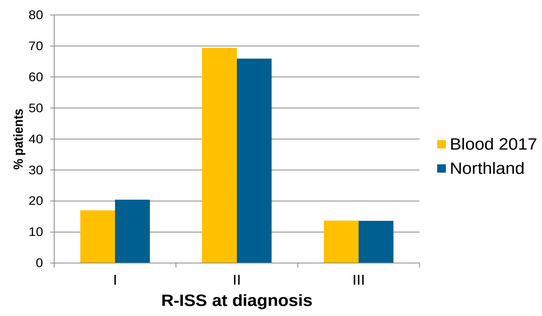

Fig 4. Disease severity vs Tandon (2017)[5]

Follow up

- Median follow up was 621 days (21-1122 days).
- 10 patients died during the study period.
- The median progression-free survival (PFS) was 23 months, however, over half of the patients (n= 21) had yet to progress at the end of the follow up period. Therefore, this represents an underestimate of the actual median PFS.
- 44% of patients (n=18) had chemotherapy-related toxicity that lead to either a dose reduction or abandonment of treatment.
- Ethnicity or socio-economic decile did not lead to a statistical difference in PFS in our cohort (*Fig. 3 and Fig. 4*). We also found no statistical difference in PFS in patients who initially presented as an emergency.

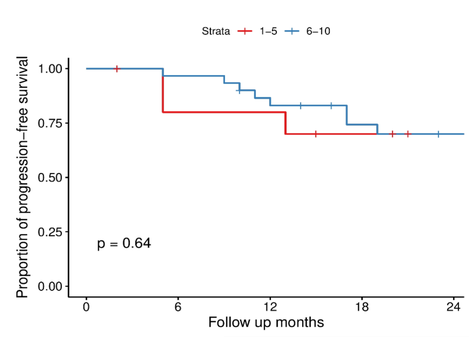

Fig 3. Kaplan-Meyer graph of PFS in low (1-5) and high (6-10) socioeconomic deciles

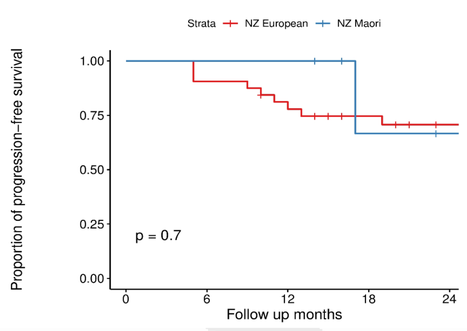

Fig 4. Kaplan-Meyer graph of PFS in patients of European and Maori ethnicity

Discussion

- Appreciating the relatively small scale of this study, the incidence of myeloma in Northland 2016-2017 appears significantly higher than the corresponding New Zealand average[1]. This was unaffected when standardized for age. Despite looking into several possible factors; this increased incidence remains unexplained.
- Further large-scale prospective research is already underway as part of the Myeloma and Related Diseases Registry, which will assess if this increased incidence is sustained and look further into potential causes.
- Interestingly, despite previous studies showing a higher incidence of myeloma in Maori populations[6] , this was not replicated in our study.
- We found no statistical relationship between ethnicity or social deprivation on PFS or treatment tolerability. Those of lower socio-economic decile in our cohort were more likely to present to hospital as an emergency, however, this did not appear to be reflected in poorer long-term outcomes
- This study also highlights the need for continued commitment in early recognition of myeloma to minimise late presentation, particularly in our lower socioeconomic groups.

References

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