PROGNOSTIC IMPACT OF INTERPHASE FISH IN MUTLIPLE MYELOMA: SINGLE-CENTRE IRISH EXPERIENCE

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INTRODUCTION

Interphase fluorescence in situ hybridisation (iFISH) on enriched bone-marrow plasma cells identifies recurrent chromosomal abnormalities in multiple myeloma (MM) with strong and reproducible associations with progression-free (PFS) and overall survival (OS).

International consensus groups (IMWG, IMS 2025) recognise specific iFISH abnormalities as high-risk features that modify prognosis and increasingly influence treatment selection.

Ireland has an ageing MM population with approximately 384 new cases per year (NCRI 2022), improving survival overall, but variable availability of advanced diagnostics and cytogenetic testing across centres.

AIM

- Evaluate the cytogenetic landscape of myeloma patients in our institution
- Assess the prognostic impact of FISH risk stratification on PFS and OS
- Compare findings with published international data

METHOD

- Retrospective analysis of 69 patients with confirmed MM (FISH successful in 67 patients)
- Electronic chart review: demographics, ISS stage, FISH alterations, treatment, response
- IMWG & IMS 2025 criteria for FISH-based risk stratification
- Response assessed by IMWG response criteria
- Kaplan–Meier survival curves; log-rank (Mantel–Cox) test; Cox proportional-hazards regression
- Analyses performed in Prism v10.6; P<0.05 considered significant
- Ethical approval obtained- South East Regional Ethics Board

CONCLUSIONS

- High-risk FISH (IMS 2025 criteria) is associated with significantly inferior OS (48 vs 88 months) and PFS (25 vs 94 months), consistent with established prognostic models.
- Age >65 confers independent adverse prognosis, reinforcing the need for age-adapted risk stratification alongside FISH-based risk assessment
- Demographic profile and cytogenetic landscape are comparable to large international series, confirming generalizability of IMWG risk frameworks to our population.

RESULTS

01 Baseline Characteristics

Male : Female ratio	IgG subtype (most common)	Extramedullary disease
68 Median age (range 46–84)	1.38:1 Male : Female ratio	65% IgG subtype (most common)	20.3% Extramedullary disease

02 FISH Cytogenetic Findings & Distribution

53.6% Any cytogenetic abnormality	39.1% High-risk FISH abnormalities as described by IMS 2025	33.3% 1q21 gain (most frequent FISH alteration)	23.2% Multiple HR lesions (≥2)

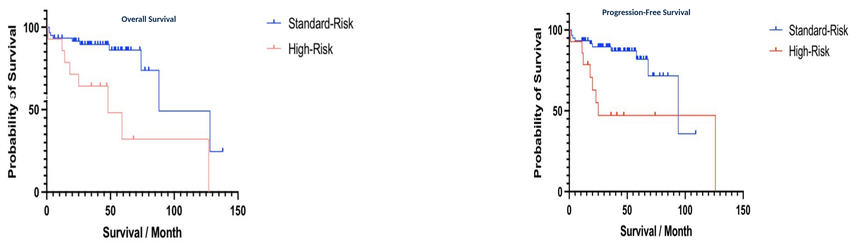
03 Stage (ISS)

Stage (ISS)	n	%
Stage I	26	40%
Stage II	21	33.8%
Stage III	17	26.2%

04 Treatment Outcomes After Front Line Treatment

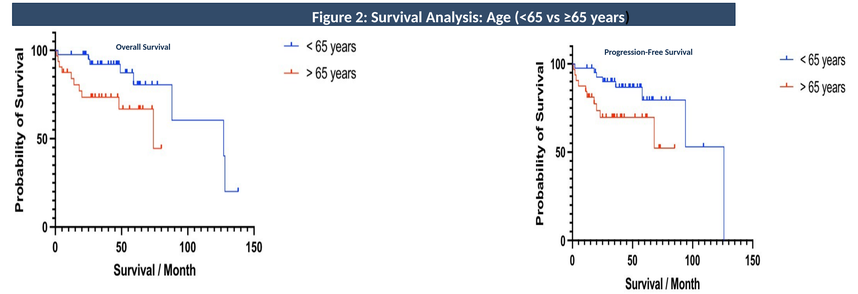
69.6% ≥VGPR achieved	37.7% Underwent ASCT	29.9% First relapse documented	5.2% Received BiTE therapy

Figure 1: High-risk FISH (IMS 2025) vs Standard-risk FISH



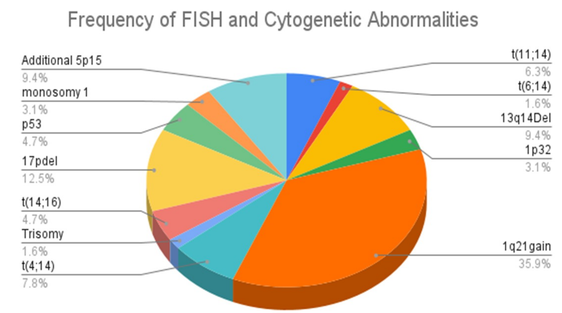
OS: p = 0.0016 | PFS: p = 0.0097 | High-risk median OS 48 mo vs Standard-risk 88 mo | High-risk Median PFS: 25 mo vs 94 mo

Figure 2: Survival Analysis: Age (<65 vs ≥65 years)



OS: p = 0.0238 | PFS: p = 0.0435 | <65 yrs median OS 127 mo vs ≥65 yrs 74 mo

Figure 3: Distribution of cytogenetic abnormalities



REFERENCES

- Kyle RA, Rajkumar SV. Multiple myeloma. *Blood.* 2008;111(6):2962–2972. PMID: **18332230**.
- Chng WJ, Dispenzieri A, Chim CS, et al. IMWG consensus on risk stratification in multiple myeloma. *Leukemia.*2014;28(2):269–277. PMID: **24157580**.
- Avet-Loiseau H, Attal M, Moreau P, et al. Genetic abnormalities and survival in multiple myeloma: the experience of the Intergroupe Francophone du Myélome. *Blood.* 2007;109(8):3489–3495. PMID: **17209057**.
- Palumbo A, Avet-Loiseau H, Oliva S, et al. Revised International Staging System for Multiple Myeloma: a report from the International Myeloma Working Group. *J Clin Oncol.* 2015;33(26):2863–2869. PMID: **26240224**.
- Boyd KD, Ross FM, Chiecchio L, et al. A novel prognostic model in myeloma based on co-