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Exploring the Link Between High-Risk Cytogenetics and Skeletal Lytic Lesions in African American (AA) Multiple Myeloma (MM) Patients: Insights From a Decade-Long Study

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INTRODUCTION

Multiple Myeloma is characterized by the clonal proliferation of plasma cells within the bone marrow. This condition frequently results in destructive skeletal lesions. The study examines the association between high-risk cytogenetics (CG) and the presence of lytic lesions in a minority population with MM.

AIM

The study aims to investigate the correlation between high-risk cytogenetics and the presence of skeletal lytic lesions in African American patients with Multiple Myeloma.

METHOD

The study conducted a retrospective review of records from biopsy-confirmed Multiple Myeloma patients at a cancer center in Brooklyn from 2013 to 2024. The inclusion criteria required the availability of FISH results and radiology records, including bone surveys, MRI, and PET/CT scans. The relative risk (RR) was calculated to determine the association between high-risk cytogenetics and the presence of lytic lesions.

RESULTS

A total of 97 patient records were reviewed, with 42 meeting the inclusion criteria for the study. The median age of the patients was 69, ranging from 36 to 90. The gender distribution included 23 males (54.7%) and 19 females (45.3%). The majority of the patients, 35 (83.3%), were African American.

- Among 42 patients, 19 (38.8%) had positive lytic lesions

For risk stratification, the following cytogenetic groups were identified based on FISH analysis.

- High-risk cytogenetics
- Standard-risk cytogenetics
- Low-risk cytogenetics

S. No	Cytogenetics	Details
1	High Risk	Mutations: P53 mutation, 17p deletion, gain of 1q, del(1p), t(14;16), t(14;20), t(4;14), gain 1q25
2	Standard-Risk	Mutations: Isolated monosomies, isolated hyperploidy, t(11;14), t(6;14)
3	Low-Risk	Normal FISH

Table 1: Overview of the distribution of various genetic abnormalities found in the patients based on the FISH analysis.

Patient Group	Total Patients	High-risk CG	Standard-risk CG	Low-risk CG
With Lytic Lesions	19 (38.8%)	10 (52.6%)	6 (31.6%)	3 (15.8%)
Without Lytic Lesions	23 (61.2%)	9 (39.1%)	7 (30.4%)	7 (30.4%)

Table 2: Overview of distribution of cytogenetic risk groups between patients with and without lytic lesions.

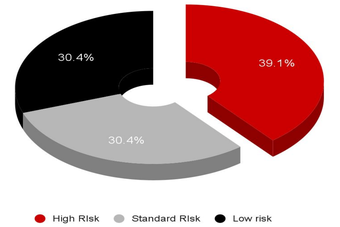


Figure 1: Illustrates the breakdown of Cytogenetics in Patients with Absent Lytic Lesions

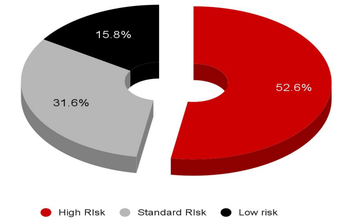


Figure: Illustrates the breakdown of Cytogenetics in Patients with Active Lytic Lesions

CONCLUSIONS

The presence of high-risk cytogenetics (CG) was associated with an increased likelihood of developing lytic lesions, with a relative risk (RR) of 1.35 compared to those with non-high-risk cytogenetics. The study recognizes the limitation of its small sample size and suggests that further research is needed to validate these findings.

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