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Prognosis and response to therapy can be efficiently predicted by a combination of cytogenetic aberrations, detected by interphase-FISH in newly diagnosed multiple myeloma patients

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Introduction: Multiple myelomas (MM) is a cytogenetically heterogeneous plasma cell malignancy. The detection and interpretation of cytogenetic abnormalities in MM is of critical importance for prognosis and risk stratification.

Objectives: To determine the role of cytogenetic aberrations in classification, risk stratification and predicting therapy response in Indian population.

Material and Methods: Retrospective interphase FISH analysis on CD138 positive plasma cells was carried out in 342 de novo multiple myeloma patients.

Results: Cytogenetic abnormalities by FISH were detected in 65% (221/342) patients. Monosomy 13/del(13q) was observed in 35% patients followed by hyperdiploidy in 33%, IgH translocations in 30%, gain(1q21) in 21% and monosomy 17/TP53 deletion in 7% patients. Our patients presented lower median age, 55.5 years, which is a decade younger than those from other countries. Low prevalence of chromosome 13 aberrations (35%) and t(11;14) (4%) was observed, as compared to the Western population probably due to geographic heterogeneity. IgH translocation group and TP53 deletion were identified as a high-risk group due to correlation with advanced disease; ISS stage III, whereas chromosome 13 aberrations were associated with high plasma cells. Complete response (CR) and very good partial response (VGPR) was observed in patients without high-risk cytogenetic abnormalities: t(4;14), t(14;20) and gain(1q21).

Conclusions: Deletion(17p13), t(4;14), t(14;20) and gain(1q21) were independent high-risk prognostic factors, can predict lower response rates to therapy, are more likely to relapse early, thus need more intensive treatments. Interphase-FISH can efficiently detect poor prognostic markers thus helping in risk stratification aiding in treatment decisions and better patient management.

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