The Impact of Bortezomib-based Induction on Chromosome 1Q21 Gained Newly Diagnosed Multiple Myeloma of Chinese Origin

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Background: Bortezomib has been reported to favourably impact the outcome of high risk MM predominantly t(4;14) and in some report 17p- its impact on gain 1q21 is unknown.

Materials and Method: To address this deficit, we have analysed CD138-sorted bone marrow plasma cells in cases treated with bortezomib based induction therapy where age, gender, isotype, ISS, LDH and iFISH were available.

Results: 1q+ was identified in 167 (66.8%) of the series and was associated with t(4;14) and high LDH but not with other HR FISH abnormalities. Gain 1q+ was not associated with response rate but did associate with shorter event free survival (EFS) (median EFS: 35 months vs 55 months, p=0.05) and overall survival (OS) (median OS 74 months vs 168, p=0.00025). Thus 1q+ was an independent adverse factors for OS together with ISS3, high LDH, del(17p) and t(4;14), multivariate analysis showed that. of the cases with 1q+, 75 (44.9%) had 3 copies and 92 (55.1%) had >3 copies of 1q21. Fifty-four (32.3%) had ≥50% cells harbouring 3 copies (gain 1q), and 57 (34.1%) had ≥ 50% cells with >3 copies. Copy number and clone size did not impact on survival. When a risk score of 1 was assigned to each of 1q+, high LDH, high risk FISH and ISS III, OS was shortened incrementally by a risk score of 0 to 4. Post-relapse/progression survival was inferior in those with 1q+ (median 60 months vs median 118 months, p=0.000316). ASCT improved OS for those with 1q+ (median OS 96 months vs 59 months, p=0.000069).

Conclusion: In conclusion, 1q+ is an adverse risk factor for OS in MM irrespective of the use of bortezomib but was partially mitigated by ASCT. A risk scoring system comprising 1q+, LDH, HR FISH and ISS is a potential tool for risk stratification in MM.

Keywords: Multiple myeloma, Cytogenetic abnormalities, Autologous stem cell transplant, Gain 1Q21, Risk score