Tetraploidy/Near-Tetraploidy in AML

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Introduction

• 1% of AML cases are believed to be tetraploidy or near-tetraploidy.
• Few studies have analyzed the association between T/NT AML and other chromosomal aberrations that are associated with favorable and unfavorable prognoses.
• The objective of this study is to provide data on treatment outcomes and the impact of certain prognostic markers on survival in cases of tetraploidy/near-tetraploidy AML.

Methods

• A systematic literature search was performed and included studies published from January 1st, 1980 to August 1st, 2019.
• 128 cases of tetraploid and near-tetraploid AML were included from the literature in addition to 2 cases from Tulane Medical Center.
• For this study, tetraploidy is defined as the presence of >10 of 20 G-banded metaphase chromosomes studied during karyotype analysis containing 92n.
• Near-tetraploidy defined with same parameters above except with cells containing 81-103n.
• Complex karyotype: 3 or more additional structural or numerical abnormalities

Results

• N = 130

<table>
<thead>
<tr>
<th>Karyotype</th>
<th>Favorable Risk (%)</th>
<th>Intermediate Risk (%)</th>
<th>Poor Risk (%)</th>
<th>HSCT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraploidy</td>
<td>15.4</td>
<td>37.7</td>
<td>46.9</td>
<td>17.7</td>
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<tr>
<td>Near-tetraploidy</td>
<td>72.3</td>
<td></td>
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<tr>
<td>Complex Karyotype</td>
<td></td>
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<tr>
<td></td>
<td>53.1</td>
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</tbody>
</table>

Conclusion

• Stratification according to risk factors based on chromosomal abnormalities showed no impact on overall survival in the population of T/NT AML. This suggests that the unfavorable risk imposed by tetraploidy/near-tetraploidy may overcome favorable-risk features, challenging current methods of AML risk stratification.
• Allogenic stem cell transplant is required in all cases to improve survival.

Future Direction

• A review of the literature to identify treatment regimens administered prior to HSCT including methods of induction and maintenance chemotherapy to further understand the role of HSCT + chemotherapy in T/NT AML.

References