Flow Cytometry as an Adjunct to Fine Needle Aspiration Cytology in the Diagnosis and Sub-classification of Primary Non-Hodgkin’s Lymphoma

Authors: Shyam Lata Jain, Pritika Kushwaha, Richa Gupta
Maulana Azad Medical College, New Delhi, INDIA

INTRODUCTION

- The WHO/REAL classification of Non-Hodgkin’s lymphoma (NHL) is based on morphology, immunology, and cytogenetic analysis.
- Fine needle aspiration cytology (FNAC) with flow cytometric immunophenotyping (FC) has shown promising results in the diagnosis and subtyping of NHL with high sensitivity and specificity.

AIMS AND OBJECTIVES

To evaluate the efficacy of FC as an adjunct to FNAC in the diagnosis and subclassification of NHL in clinico-cytologically suspected cases.

MATERIALS AND METHODS

- 61 patients clinically and/cytologically diagnosed/suspected of NHL were evaluated.
- Age & gender: 4-77 years, M > F,
- Site: CX LAP, followed by generalized LAP
- FC was performed in all cases with a panel of antibodies (CD3, CD2, CD4, CD5, CD8, CD7, CD10, CD19, CD20, CD23, CD45, κ, and λ).
- FNAC findings and FC were compared; subtyping of NHL was performed and the results were further correlated with histopathological diagnosis in all cases.

RESULT

1. Combined FNAC-FC, aided in the definitive diagnosis of NHL in 47/61 cases (77%).
2. Combined FNAC-FC helped to sub-classify accurately 43/61 cases (70.49%).
3. Majority of the cases were of B-NHL (75.9%) and the most frequent subtype was DLBCL (46.51%) followed by SLL (30.23%); single case of Mantle cell lymphoma.
4. Histopathology was considered as the gold standard:
   - For the accurate diagnosis of NHL: sensitivity, specificity, PPV, NPV, and diagnostic accuracy was found to be 86.96%, 100%, 100% 14.29% and 87.23% respectively and;
   - For the subclassification of NHL: sensitivity, specificity, PPV, NPV, and diagnostic accuracy was found to be 80.43%, 100%, 100% 10% and 80.85% respectively.

DISCUSSION

1. Diagnosis of NHL by FNAC-FC
2. Sub-classification of NHL by FNAC-FC

<table>
<thead>
<tr>
<th>STUDY</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>AUTHOR</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeppe et al (2004)</td>
<td>93%</td>
<td>100%</td>
<td>100%</td>
<td>91%</td>
<td>Dey et al (2006)</td>
<td>83%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Demurtas et al (2010)</td>
<td>97%</td>
<td>94%</td>
<td>-</td>
<td>-</td>
<td>Bangertler et al (2007)</td>
<td>85.6%</td>
<td>100%</td>
<td>100%</td>
<td>55.6%</td>
</tr>
<tr>
<td>Senjug et al (2010)</td>
<td>94.9%</td>
<td>100%</td>
<td>-</td>
<td>-</td>
<td>Senjug et al (2010)</td>
<td>79.1%</td>
<td>85.7%</td>
<td>97.1%</td>
<td>40%</td>
</tr>
<tr>
<td>Present study</td>
<td>84.62%</td>
<td>100%</td>
<td>100%</td>
<td>14.29%</td>
<td>Present study</td>
<td>76.9%</td>
<td>100%</td>
<td>100%</td>
<td>10%</td>
</tr>
</tbody>
</table>

CONCLUSION

- FNAC-FC: when used in conjunction, provides fairly accurate and reliable diagnosis, also helps in subclassification of NHL that correlates well with histopathology considering as a gold standard. It also helps to differentiate reactive lesions from lymphoma in cases where FNAC alone may fail.
- FNAC-FC should be preferred in the diagnosis of NHL as a first line of investigation provided that the centre is updated with complete and extended panel of antibodies.

REFERENCES