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Role of fine needle aspiration cytology in pediatric lymphomas including anaplastic large cell lymphoma

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Introduction: Peripheral lymphadenopathy in the pediatric age group is screened using fine needle aspiration cytology (FNAC). Aspirates suspicious for lymphoma on FNAC need to undergo biopsy whereas in other malignancies investigations for the primary site are started. Hodgkin's lymphoma, T lymphoblastic lymphoma, and Burkitt's lymphoma are the common types in children. Anaplastic large cell lymphoma (ALCL) is a rare subtype characterized by the presence of unusual giant cells which are CD30 and Alk-1 positive. ALCL on FNAC shows unusually large and bizarre tumor cells. Prospective use of ALK-1 immunocytochemistry for diagnosis of poorly differentiated tumors showing unusual giant cells has not been reported.

Methods: All aspirates seen over a 6-year period from November 2009 to November 2015 in which a diagnosis of ALCL or Hodgkin's lymphoma (HL) with bizarre giant cells were suspected on cytomorphology were prospectively selected. Twenty such aspirates were subjected to CD-30 and ALK-1 immunocytochemistry (ICC). A subsequent biopsy was available in all cases.

Results: Most of the selected patients (85%) had lymphadenopathy. The extra nodal presentation was seen in three cases. Overall male: female ratio was 5.6:1 with age ranging from 8 to 76 years. Out of 20 cases, seven cases, suspected to be ALCL on FNAC, were confirmed on biopsy. ALK-1 was positive in both cytology and biopsy of 6/7 of these. Two cases suspected to be ALCL on cytomorphology were HL (1) and diffuse large B-cell lymphoma (DLBCL) (1) on biopsy, both of which were ALK-1 negative on cytology. Eight cases of HL and three cases of large-cell NHL, which were all ALK-negative on cytology, were confirmed on biopsy. One CD30 positive DLBCL and one ALK-negative ALCL showed concordant results of ICC on cytology and histology.

Conclusions: FNAC is used as a screening test for all lymphadenopathies to rule out infections like tuberculosis common in India. Malignancies are rare. Lymphomas require early biopsy while other malignancies require a different work up. HL, DLBCL, and ALCL had bizarre giant cells of Hallmark type and presented in children as well as adults. These are a diagnostic problem in cytopathology. Cytokeratin was useful in excluding carcinoma. CD30 and ALK-1 immunocytochemistry helped in early diagnosis of ALCL on cytological material and differentiating from HL and DLBCL. The morphological spectrum of ALCL is wide and it may be misdiagnosed as a metastatic poorly differentiated malignant tumor on FNAC. Identification of unusual giant cells on FNAC helps in establishing a diagnosis on an early lymph node biopsy. ICC for ALK and CD30 is useful in aspiration cytodiagnosis of ALCL. A pictorial guide for FNAC findings in all pediatric lymphomas is presented.

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