Laboratory diagnosis of acute leukemia in Iraq, the available options

Irak'ta akut löseminin laboratuvar tanısı, uygun seçenekler

Abbas Hashim Abdulsalam

Hematology Unit, Teaching Laboratories Department, al-Yarmouk Teaching Hospital, Iraq

To the Editor,

Diagnosis of acute leukemia in Iraq is mainly dependent on the personal experience of the laboratory physician. Local guidelines in this field were never proposed and the international guidelines are very difficult to apply as the only available techniques include morphology of peripheral blood and bone marrow specimens plus very limited immunohistochemistry CD markers and PCR testing for BCR-ABL oncogene only, therefore the aim for diagnosis, classification and subclassification of acute leukemia in this country should be that of diagnosis and lineage assignment that serves a clear therapeutic goal.

Having been working in the field of laboratory hematology since 2003 in the major teaching hospitals in Baghdad, I found that the following scheme is the available useful option:

Acute leukemia should be classified on the basis of FAB group, but using a cut-off point of 20% blast cells, as proposed in the WHO classification [1].

Acute myeloid leukemia

With Romanowsky stain morphology AML- M2, M3, M4, M5b and M6 can be recognized readily.

By adding few special stains such as Sudan black B (SBB) [2] (and not myeloperoxidase as SBB has a little more sensitivity in detecting myeloblasts which is the crucial point), plus a non-specific esterase stain as α-naphthyl acetate esterase it becomes possible to recognize AML-M1 and most cases of AML-M5a [3].

The AML cases that cannot be distinguished by morphology and cytochemistry, specifically M0 and M7, for which the presence of myeloid dysplasia in the former and the cytoplasmic blebs in the latter may give a hint for the probable diagnosis, however there is still the need for more positive diagnostic technique and as the flow cytometry immunophenotyping is not available then the use of a limited number of CD markers study by immunohistochemistry to identify the lineage of acute leukaemia is the option, these include CD33, anti-myeloperoxidase and CD41.

Rare types of AML like M5c require high degree of morphology experience, in which malignant cells appearance is reminiscent of tissue histiocytes [4].

There is still a small proportion of cases that would be only certainly diagnosed after the response to treatment as in rare forms of AML-M3v [5].

Address for Correspondence: M.D. Abbas Hashim Abdulsalam, Iraq-Baghdad-al-Yarmouk Teaching Hospital 964 Baghdad, Iraq
Phone: 964 7904 188690 E-mail: dr.abbas77@yahoo.com

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Acute lymphoblastic leukemia

Consideration of clinical as well as hematological features permits a strong presumptive diagnosis of ALL.

Morphologically if a case of acute leukaemia has the cytological feature of ALL-L1 then it is highly likely that it does represent ALL [6]. Also if a patient with an acute leukemia showing heterogeneous blasts that has no morphological or cytochemical markers of myeloid differentiation with unavailability of further differentiating procedures then it may be treated as ALL-L2, as statistically speaking it would be much more possible than AML-M0 [7]. ALL-L3 diagnosis would be obvious by morphology alone.

The negative result in staining with SBB is very helpful, also the addition of the special stain PAS would improve the chances of the correct diagnosis of ALL.

Clinical setting may presumptively aid in differentiating between B- and T- ALL, however, using immunohistochemistry antibodies including CD79a for B lineage and CD3 for T lineage are necessary.

Rare cases of ALL-L2 that are confused with leukemic phase of large cell lymphoma can be differentiated through the use of TdT immunohistochemistry typing on bone marrow biopsy slide, which would be positive in ALL but not in lymphoma.

After setting the diagnosis of B-ALL, having performed immunohistochemistry CD20 typing and ordering PCR for BCR-ABL fusion gene would affect the treatment options.

Conclusion

In Iraq it is essential at this time where the diagnostic resources are very limited to establish guidelines that are simple and practical in developing cost-effective diagnostic protocols for conditions for which the treatment is available, plus leaving the door wide open for future improvements, as the introduction of newer techniques and added procedures to the already available ones once a newer therapeutic agent has been introduced.

Also it is always a realistic option to seek a more precise diagnosis with genetic study and lineage specification outside this country for those who can afford it.

Conflict of Interest

No author of this paper has a conflict of interest, including specific financial interests, relationships, and/or affiliations relevant to the subject matter or materials included in this manuscript.

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