" TRAMETINIB'S TRANSFORMATIVE ROLE IN LANGERHANS CELL HISTIOCYTOSIS MANAGEMENT: A CASE REPORT "

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Introduction

Langerhans Cell Histiocytosis (LCH) is a rare inflammatory neoplasm of myeloid origin, primarily driven by mutation in MAPK pathway, most notably BRAF. It present with a broad clinical spectrum, including lytic bone lesions, endocrine dysfunction and multisystem involvement. Diagnosis is often challenging due to its variable clinical manifestations and typically requires histological confirmation.

Objective

To present a complex case illustrating the challenges in diagnosis and management of multisystem LCH and the application of targeted therapy with trametinib.

Case Presentation

In November 2022, A 6-month-old male infant presented to our tertiary care hospital with diffuse rash, fever, and pancytopenia. Clinical assessment and biopsy confirmed multisystem LCH harboring a BRAF mutation.

Initial treatment with standard LCH protocol (prednisolone and vinblastine) achieved partial improvement. Persistent fever and cytopenia raised suspicion for secondary hemophagocytic lymphohistiocytosis (HLH). Subsequently, HLH-directed therapy with dexamethasone and etoposide was started which resolved the fever but pancytopenia persisted.

Genetic sequencing confirmed BRAF mutation. Targeted therapy with trametinib, a MEK inhibitor, was initiated. Within six weeks, the patient achieved clinical remission with resolution of rash, fever, cytopenia, and hepatosplenomegaly.

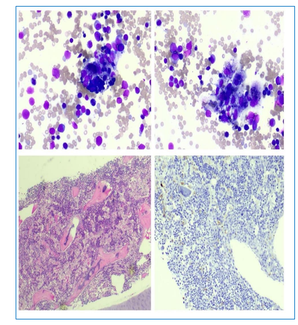


Figure: Irregular Langerhans Cells with groove of varied size amidst the Red blood cells

Conclusion

Given the demonstrated efficacy of trametinib, our case highlights the diagnostics and therapeutic challenges associated with the high-risk LCH, while highlighting trametinib as a promising precision medicine strategy for the BRAF mutated, treatment-refractory LCH.

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