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Case Report

Lymphoglandular bodies as useful morphological clue in diagnosis of Lymphoid malignancies- A Case Report

Rateesh Sareen [1*], Garima Agarwal [1], Gajendra Nath Gupta [1]

Affiliation

[1] Department of Pathology & Transfusion Medicine, Santokba Durlabhji Hospital, Jaipur-302004, Rajasthan ,India.

***Corresponding Author**
Rateesh Sareen, D.N.B Pathology, Department of Pathology & Transfusion Medicine, Santokba Durlabhji Hospital, Jaipur-302004, Rajasthan, India.
Email:drrateeshsareen@yahoo.co.in

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Abstract

Lymphoglandular bodies, observed as round basophilic cytoplasmic fragments on Giemsa stain, are linked with lymphoid malignancies, aiding in distinguishing lymphomas from other small round cell tumors. This case report underscores the diagnostic significance of Lymphoglandular bodies in Acute lymphoid leukemia diagnosis through bone marrow biopsy. We present a case of a 21-year-old male with chest pain and weakness. The bone marrow biopsy revealed a monomorphic cell population with a high nuclear cytoplasmic ratio, prompting immunomarker analysis that confirmed the presence of blasts as lymphoblasts, leading to the diagnosis of Acute lymphoid leukemia. The identification of Lymphoglandular bodies in bone marrow biopsy facilitated the diagnosis, as peripheral blood examination did not indicate the presence of blasts suggestive of leukemia. Literature on the role of Lymphoglandular bodies in lymphoma diagnosis is limited, with more emphasis on cytological preparations. Lymphoglandular bodies serve as an adjunct in differentiating between lymphoma and non-lymphoma malignancies, being more frequently associated with Malignant lymphoma. The study aim to prove Lymphoglandular bodies as useful morphological clue in diagnosis of Lymphoid malignancies.

Keywords: Acute, Bone marrow biopsy, Lymphoglandular bodies, Leukemia, Giemsa stain

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Introduction

Lymphoglandular bodies (LGB) stand out as distinctive entities, manifesting as round basophilic fragments with either smooth borders or projections discernible upon Giemsa stain examination.[1] These minute cytoplasmic components trace their origin to lymphoid tissues, encompassing structures like lymph nodes, tonsils, the thymus, and the spleen.[2] Originally noted as hyaline bodies by Downey and Weidenreich, their formal nomenclature, "lymphoglandular bodies," was established by Soderstrom in 1966, notably in correlation with lymphoid malignancies.[3] The hallmark of lymphoglandular bodies in lymphoid aspirates delineates a diagnostic path, observable across both benign and malignant lymphoid pathologies. Their significance transcends mere identification, pivotal in the discrimination between lymphomas and other small round cell tumors. This includes a spectrum ranging

from Neuroblastoma, Ewing's sarcoma, and Retinoblastoma to Wilms' tumor and Embryonal rhabdomyosarcoma.[4]

In histopathological analysis, particularly in H&E stained sections, the quantification of lymphoglandular bodies served as a diagnostic anchor. Studies by Murakami et al. have delineated that the presence of more than 20 LGB per high-power field distinctly characterizes a spectrum of conditions, encompassing lymphoid malignancies, undifferentiated carcinoma, multiple myeloma, and seminoma.[5] The enumeration and identification of abundant LGB within H&E stained sections, with a particular emphasis on cases of Acute lymphoid leukemia in bone marrow biopsies, form the central focus of this discourse. The pivotal role of LGB in diagnosis extends beyond mere enumeration, playing a multifaceted role in the clinical landscape. Beyond their contribution to the identification of lymphoid malignancies, they offer insights into the underlying pathology. This extends to guiding treatment strategies, thus assuming a pivotal role in the therapeutic trajectory of patients.[6]

Moreover, the interpretation of histopathological findings, facilitated by a thorough comprehension of LGB's significance, empowers clinicians to make informed decisions regarding patient care. This extends to treatment modalities, prognostic assessments, and therapeutic monitoring, thereby enhancing overall patient outcomes. In essence, the recognition and interpretation of lymphoglandular bodies represent a cornerstone in contemporary diagnostic pathology.[7] Their presence not only aids in the discrimination between various pathological entities but also serves as a compass guiding therapeutic interventions. Thus, a comprehensive understanding of their diagnostic implications is indispensable for clinicians navigating the complex terrain of modern-day medicine.[8] Our study aimed to explain a case report on Lymphoglandular bodies as useful morphological clue in diagnosis of Lymphoid malignancies.

Case Report

A 21 years old male patient presented with chest pain and weakness. The laboratory investigations revealed Blood Urea Nitrogen- 22mg/dl, Creatinine -0.8 mg /dl, Sodium-135 m mol/litre, Potassium-3.8 m mol/liter, Chloride-98 m mol/lit, Glucose-100 mg/dl, SGOT- 134U/L, SGPT-93 U/L, Total Bilirubin-0.6 mg/dl, Direct Bilirubin-0.2 mg/dl, Total protein-5.5 gm/dl , Albumin-3.1 gm/dl, Globulin-2.4 gm/dl , A/G ratio-1.29, Alkaline phoshatase-115 U/L, Gamma GT-84 U/L, Bleeding time-2 minutes, clotting time-5 minutes and PT-13.5 An automated complete blood count (CBC) demonstrated Haemoglobin- 12.4 g/L (reference range 13.0-17.0 g/L), White blood cell count 25.94 x 10^9 /L (reference range 4-10 x 10^9 /L) Platelet count 213 x 10^9/L (reference range 150-450 x 10^9/L) , Hematocrit 37 % (reference range-36%-46%), differential count –Neutrophils-76%, Band forms-02%, Lymphocytes-22%. A concurrent peripheral blood smear showed normocytic normochromic red blood cells. Test for HIV 1 & 2, Hepatitis B and C viral serology were non-reactive. Malarial smears and rapid malarial antigen test were negative. Routine urine examination did not detect any abnormality. Bone marrow examination revealed presence of Blasts-50%, Myelocytes-11%, Lymphocytes-10% and erythroblasts-05%. The bone marrow biopsy was replaced by monomorphic population of cells having high nuclear cytoplasmic ratio and immunomarkers were advised which further confirmed blasts as lymphoblasts helping the team to reach diagnosis of Acute Lymphoid leukemia. The presence of LGB in bone marrow biopsy aided in diagnosis as peripheral blood examination did not have blasts to suspect leukemia (Figure 1).

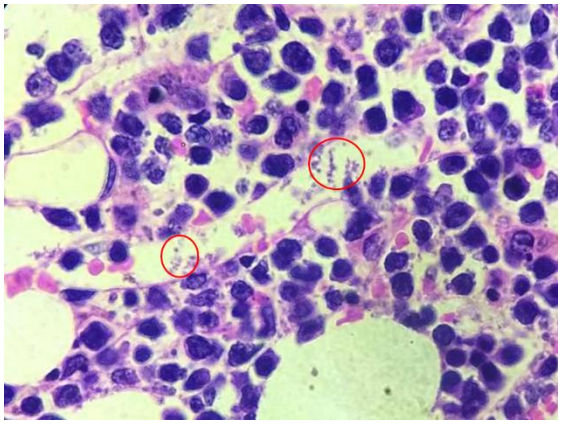

Figure:1 Lymphoglandular bodies in Bone Marrow biopsy (H & E stain)

Discussion

The common occurrence of LGB are seen in response to trauma to the lymphoid cells that occurs due to aspiration & smearing of cells while performing Fine needle aspiration or bone marrow aspirate. In 1968, Soderstrom proposed that LGB are seen in B cell neoplasms, but later there were more studies that have shown presence of LGB in T cell neoplasm and even Myeloid lineage proliferations.[9] LGB in cytological preparations are best visualized with Giemsa stain where they appear as round, pale basophilic fragments with smooth borders or projections. The size of LGB varies from 2 – 7 um (equal to red blood cell).[10] LGB are pale light basophilic without granulare, a feature that distinguish them from platelets.[11] In histological sections LGB appear as large round cytoplasmic fragments with smooth outline.[12] Takahisa Murakami et al, in their study reviewed 110 biopsies and performed terminal deoxyribosyl transferase-mediated dUTP-biotin nick end labelling (TUNEL) method on LGBs. 40 % of malignant lymphoma cases showed presence of LGBs. whereas LGBs were seen in only 3 (3.8%) non-lymphoma cases (undifferentiated carcinoma, seminoma, and multiple myeloma). The presence of LGBs favours a diagnosis of malignant lymphoma in histologic sections.[5]

Flanders E, in their study investigated the association of LGBs with malignant tumors in 132 cytologic smears from malignant neoplasms. Three experienced observers independently scored Diff-Quik-stained smears as to cellularity and number and size of lymphoglandular bodies. Of the 28 lymphomas, 5 had easily identifiable lymphoglandular bodies and 19 had numerous lymphoglandular bodies. 6 of 104 nonlymphoid malignancies with easily identifiable lymphoglandular bodies (defined as > 2 lymphoglandular bodies per high-power field) and 3 with numerous lymphoglandular bodies (> 10 per high-power field) were found. These tumors consisted of two cases of small-cell carcinoma, four non-small-cell carcinomas, one ganglio neuroblastoma, one melanoma, and one seminoma.[13] In 1997, Bangerter M et al, examined 588 cytologic smears from high-grade Non-Hodgkin's lymphoma (NHL), carcinoma, and sarcoma. Two independent observers scored smears to number, size, color, form, and smear background of the LGB. In 68 of 359 (19%) nonlymphoid malignancies rare (defined as <1 LGB per high-power field) or occasional LGB (defined as 1–20 LGB per high-power field) were detectable. Half of these tumors consisted of melanomas, small cell lung carcinomas, and teratomas; the other half encompassed undifferentiated sarcomas. However, none of the smears obtained from carcinoma or sarcoma tissue had abundant LGB (defined as >20 LGB per high-power field). When number of LGB was estimated to be abundant, the sensitivity for diagnosing a lymphoma was 54%; however, specificity was 100%. The difference in showing LGB between high-grade NHL and carcinoma/sarcoma was highly significant (p=0.0001). The study concluded that the presence of abundant LGB in cytologic smears strongly suggests the diagnosis of lymphoma, while the absence of LGB nearly excludes this diagnosis.[14]

Ayana Suzuki at al, assessed cytological differences between Mucosa-associated lymphoid tissue lymphoma (MALT-L) and Nonneoplastic lymphocytes using thyroid liquid-based cytology (LBC) in 35 MALT-L cases, 3 diffuse large B-cell cell lymphoma (DLBCL) cases, and 44 prominent Non-neoplastic lymphocytic infiltration cases. In MALT-L cases, the incidence of lymphoglandular bodies in the LBC specimens was lower than that in the conventional specimens ($p < 0.001$). They found that Lymphoglandular bodies were not reliable markers for lymphoma diagnosis using LBC specimens.[15] Limitations of the study includes the presence of lymphoglandular bodies (LGB) of diagnostic significance in various pathological contexts, several limitations warrant consideration. Firstly, the interpretation of LGBs relies heavily on cytological and histological examination techniques, such as Giemsa stain and H&E staining. Variations in staining protocols and interpretation criteria across different laboratories may introduce inconsistency in LGB identification and quantification. Furthermore, while LGBs are often associated with lymphoid malignancies, their presence in non-neoplastic conditions and non-lymphoid malignancies complicates their diagnostic specificity.

Conclusion

In conclusion, the presence and interpretation of lymphoglandular bodies (LGB) in diagnostic pathology serve as a critical tool in delineating various pathological entities and guiding therapeutic interventions. Originating from lymphoid tissues, including lymph nodes, tonsils, thymus, and spleen, LGBs manifest as distinctive basophilic fragments observable through Giemsa stain examination. Their identification and quantification in histopathological analyses, particularly in H&E stained sections, offer invaluable diagnostic insights, especially in the context of lymphoid malignancies such as acute lymphoid leukemia. The diagnostic significance of LGB extends beyond mere enumeration, as their presence aids in discriminating between different pathological conditions and informs treatment strategies.

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