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(CASE REPORT)

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Co-existent MDS and lymphoma in a young pregnant woman: A case report and literature review

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Abstract

Myelodysplastic neoplasms (MDS) represent a diverse group of clonal myeloid disorders marked by ineffective hematopoiesis, leading to cytopenias and dysplastic hematopoietic cells. Rarely, MDS may coexist with Non-Hodgkin Lymphoma (NHL), often emerging as a secondary complication post-lymphoma treatment. However, concurrent diagnosis of MDS and lymphoma prior to any chemotherapy or radiotherapy exposure is uncommon. This article discusses a rare case of co-existent MDS and T-cell lymphoma in a young pregnant woman, along with a literature review. Clinical findings, laboratory results, and bone marrow aspiration indicated the presence of both MDS and NHL, with subsequent lymph node biopsy confirming T-cell lymphoma. Literature reveals multiple hypotheses for the coexistence of MDS and lymphomas, including common pathogenic pathways, overlapping genetic mutations, or shared immunological abnormalities. Mutations like TP53, ASXL1, DNMT3A, and RUNX1 are frequently implicated in both MDS and lymphoma and suggest a potential common origin for these diseases. Prognosis remains poor for patients with concurrent MDS and NHL due to limited therapeutic options. Treatment is complex and must consider patient age, comorbidities, and MDS and lymphoma subtypes. Advances in genetic analysis provide insights into the shared etiology of these diseases, potentially aiding in future therapeutic approaches. This case underscores the clinical and therapeutic challenges presented by concurrent MDS and lymphoma and highlights the need for specific management strategies.

Keywords: MDS; T-cell Lymphoma; Co-existence; Therapy-related MDS; Overlapping genetic mutations

1. Introduction

Myelodysplastic neoplasms (MDS) are a diverse set of clonal myeloid neoplasms with dysregulated hematopoiesis, causing cytopenia and dysplastic hematopoietic cells. MDS is marked by recurrent chromosomal abnormalities, clinical and genetic diversity, and varying prognoses (1).

MDS associated with Non Hodgkin's lymphomas (NHL) has been rarely described in literature. MDS is often associated with post lymphoma chemotherapy or radiotherapy, it is rarely developed during diagnosis or prior to any exposure to chemo-radiotherapy for lymphoma (2). Herein, we describe a rare case diagnosed of a concurrent MDS and T-cell lymphoma in a young female pregnant patient together with a literature review.

2. Case report

A 36-year-old female patient, pregnant at her third trimester with no medical history, was admitted with multiple lymphadenopathies in the cervical chains.

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The laboratory examinations revealed a pancytopenia with a hemoglobin value of 6.6 g/dl, a WBC count of $1.69x10_3$/ul, and a platelet count of 148x103/ul . Peripheral blood smear revealed no blasts and the presence of 16% of atypical lymphoid cells (figure 1). In addition we noticed signs of dysplasia in neutrophils.

The lactate dehydrogenase (161U/l) B12 levels and the other biochemical test results were normal. The result of direct Coombs's test was negative.

The first bone marrow aspiration performed revealed 2% of atypical lymphocytes and 4% of blasts. Dysplasia was found in myeloid cells, megakaryocytes and erythroblasts.

The cervical lymph node biopsy result was histopathologically identified as T-cells Non Hodgkinien Lymphoma (T-cells NHL).

A second bone marrow aspiration was performed after child delivery for further investigations and has showed an invaded bone marrow with 86% of atypical lymphocytes. (Figure 1)

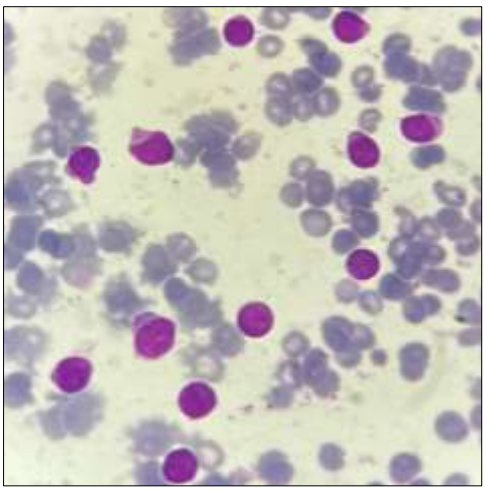

Figure 1 Atypical lymphoid cells of medium size with a nucleocytoplasmic ratio of 0.9, the nuclei have very irregular contours, often notched with dense chromatin, and the cytoplasm is slightly basophilic and agranular

3. Discussion

The coexistence of lymphoma and myelodysplastic syndrome (MDS) presents a rare but clinically significant challenge in hematology. Some authors consider both diseases to be unrelated and that their simultaneous occurrence is coincidental, however several hypotheses have been proposed to explain their concomitant occurrence; like the higher incidence of some lymphomas in advanced age that might predispose also to significant comorbidities including other hemopathies such as MSD, overlapping genetic mutations, prior chemotherapy or radiotherapy, or immunological dysfunction, and some authors suggest that the two diseases are caused by the same neoplastic process or a common origin, while others presume that MDS plays a predisposing role in the development of lymphoid neoplasms, since it is often associated with abnormal immunological functions (3-6).

A scientific review has shown that of 21 described associations of MDS and lymphoma, 9 cases were diagnosed simultaneously. MDS has been known to be associated with the development of a variety of neoplasms like solid tumours and carcinoma. The study showed a high incidence of MDS in relation with lymphoid neoplasm such as acute lymphoblastic leukemia, chronic lymphocytic leukemia, and Non-Hodgkin lymphoma (3, 4).

Another study showed that this association has been described in 24 patients presenting different types of lymphoma with a median survival of 8 months. Underscoring, as also found in other studies, that the prognosis for patients with co-existent MDS and Lymphoma has been reported to be very poor (5).

A case report of a patient presenting a rare combination of diffuse large B-cell lymphoma, acute myeloid leukemia complicating MDS and lymphoplasmacytic lymphoma in whom genetic analysis revealed mutations in TP53 and ASXL1, both being linked to MDS and lymphoma, suggesting that these conditions may share common pathogenic pathways.

Multiple theories have been proposed, including immunosuppression mediated by chronic small B lymphocytic proliferative disorder, or a common stem cell defect (6).

In fact; common molecular biological abnormalities might exist in both myeloid and lymphoid cell lineages and several studies have shown clonality of lymphocytes in MDS patients. Moreover, cytogenetic abnormalities were also identified in lymphocytes of MDS patients with monosomy 7, trisomy 8 and 20q deletion in the bone marrow cells. therefore, concluding that co-existent MDS and Lymphoma may arise from a common origin. In the present case, bone marrow cytogenetics demonstrated a complex caryotype (4).

As for MDS following lymphoma treatment (t-MDS), multiple case reports and clinical series have documented its occurrence.In a study that analyzed the clinical characteristics and outcome of t-MDS diagnosed in patients with a history of lymphomas and Multiple Myeloma. The most common primary lymphoid neoplasms were Multiple Myeloma, followed by Hodgkin lymphoma and diffuse large B-cell lymphoma, the median time between diagnosis of lymphoid neoplasm and the onset of t-MDS was 4 to 5 years (7).In fact, therapy-related MDS (t-MDS) often emerges as a late complication following treatment of lymphoma, especially in patients exposed to alkylating agents or topoisomerase II inhibitors due to cumulative DNA damage (5, 8-9). Another case report documented a high-risk MDS following CAR T-cell therapy in a patient with relapsed DLBCL. The patient developed MDS eight months after receiving CAR T-cell therapy, with subsequent findings of chromosome 7 deletion and a RUNX1 mutation that are linked to clonal hematopoiesis, which predisposes patients to secondary myeloid malignancies (9).

The molecular basis for the co-occurrence of lymphoma and MDS is increasingly understood, thanks to advances in genetic sequencing and biomarker studies. One of the most commonly implicated genes in both diseases is TP53, a tumor suppressor gene that regulates cell cycle and apoptosis. TP53 mutations are found in up to 20% of patients with both MDS and lymphoma and are especially common in therapy-related MDS, and on a higher rate in patient developing MDS after lymphoma treatment. Similarly, TP53 mutations have been observed in chronic lymphocytic leukemia patients who later develop MDS (10). Other genetic mutations, such as ASXL1, DNMT3A, and RUNX1, are also commonly observed in both MDS and lymphoma (11).

The coexistence of lymphoma and MDS poses significant challenges for treatment. MDS adversely impacts the prognosis of Lymphoma, generally worsening the patient's clinical condition and limiting the possibility of a complete therapeutic approach. The medical approach to patients with concomitant MDS and Lymphoma is complex and affected by the patient's age, performance status, comorbidities, Lymphoma and MDS subtype and severity. It may vary from only supportive care to mild cytoreduction, intensive chemotherapy, and possible stem cell transplant. Several cytotoxic agents indicated for lymphoma as alkilators or antracyclines are avoided in this situation since they maintain cytopenias and potentially favour leukaemic progression. Thus, a careful evaluation of the treatment choice for patients in whom there is the coexistence of MDS and NHL is necessary (3-4).

4. Conclusion

Our case report shows a rare co-existence of MDS and T-cell NHL. Similar studies have provided valuable insights into the pathogenesis, clinical presentation, and treatment outcomes of these patients, but many questions remain unanswered.Hematologists should pay close attention to this extremely rare case to avoid misdiagnosis. concomitant MDS should always be suspected and researched in patients with Lymphoma with associated cytopenias; in these cases bone marrow evaluation together with cytogenetic study is necessary to distinguish between lymphoma marrow infiltration and a co-existing primary MDS.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Lee, W. H., Lin, C. C., Tsai, C. H., Tien, F. M., Lo, M. Y., Tseng, M. H., Kuo, Y. Y., Yu, S. C., Liu, M. C., Yuan, C. T., Yang, Y. T., Chuang, M. K., Ko, B. S., Tang, J. L., Sun, H. I., Chuang, Y. K., Tien, H. F., Hou, H. A., & Chou, W. C. (2024). Comparison of the 2022 world health organization classification and international consensus classification in myelodysplastic syndromes/neoplasms. Blood cancer journal, 14(1), 57. https://doi.org/10.1038/s41408-024-01031-9.

[2] Bucelli, C., Fattizzo, B., Cattaneo, D., Giannotta, J. A., Barbullushi, K., Pasquale, R., Barozzi, E., Barbanti, M. C., Pettine, L., Rossi, F. G., Reda, G., Cassin, R., Barcellini, W., Baldini, L., &Iurlo, A. (2021). Co-Occurrence of Myeloid and Lymphoid Neoplasms: Clinical Characterization and Impact on Outcome. A Single-Center Cohort Study. Frontiers in oncology, 11, 701604. https://doi.org/10.3389/fonc.2021.701604.

[3] Reis, Gokce&Bahadır, Aysenur&Erduran, Erol. (2018). T-cell Non-Hodgkin lymphoma associated with myelodysplasia: A case report in a child. Medical Science and Discovery. 5. 202-206. 10.17546/msd.421622.

[4] Huang, H. H., Zhu, J. Y., Han, J. Y., Shen, L. J., Xu, L., Chen, X. L., Zheng, L. Y., & Chen, F. Y. (2009). Co-existent de novo myelodysplastic syndrome and T-cell non-Hodgkin lymphoma: a common origin or not?. The Journal of international medical research, 37(1), 270–276. https://doi.org/10.1177/147323000903700134.

[5] Dozzo, M., Zaja, F., Volpetti, S., Chiozzotto, M., Puglisi, S., Mazzucco, M., Perali, G., & Fanin, R. (2014). Two cases of concomitant diffuse large B-cell lymphoma and myelodysplastic syndrome. American journal of hematology, 89(10), 1011–1013. https://doi.org/10.1002/ajh.23783.

[6] Zhang, L. B., Zhang, L., Xin, H. L., Wang, Y., Bao, H. Y., Meng, Q. Q., Jiang, S. Y., Han, X., Chen, W. R., Wang, J. N., & Shi, X. F. (2023). Coexistence of diffuse large B-cell lymphoma, acute myeloid leukemia, and untreated lymphoplasmacytic lymphoma/waldenströmmacroglobulinemia in a same patient: A case report. World journal of clinical cases, 11(18), 4295–4305. https://doi.org/10.12998/wjcc.v11.i18.4295.

[7] Gołos, A., Mikulski, D., Grobelska-Kowalik, M., Mądry, K., Lis, K., Sobas, M., Ożańska, A., Czemerska, M., Hawrylecka, D., Stelmach-Gołdyś, A., Chromik, K., Puła, B., Sobczyk-Kruszelnicka, M., & Góra-Tybor, J. (2024). Characteristics and outcomes of patients with lymphoma who developed therapy-related acute myeloid leukemia or myelodysplastic syndrome - a retrospective analysis of the Polish Adult Leukemia Group. Contemporary oncology (Poznan, Poland), 28(2), 149–157. https://doi.org/10.5114/wo.2024.141727.

[8] Al-Juhaishi, T., Khurana, A., & Shafer, D. (2019). Therapy-related myeloid neoplasms in lymphoma survivors: Reducing risks. Best practice & research. Clinical haematology, 32(1), 47–53. https://doi.org/10.1016/j.beha.2019.02.008.

[9] Cappell, K. M., & Kochenderfer, J. N. (2023). Long-term outcomes following CAR T cell therapy: what we know so far. Nature reviews. Clinical oncology, 20(6), 359–371. https://doi.org/10.1038/s41571-023-00754-1.

[10] Haferlach, T., Nagata, Y., Grossmann, V., Okuno, Y., Bacher, U., Nagae, G., Schnittger, S., Sanada, M., Kon, A., Alpermann, T., Yoshida, K., Roller, A., Nadarajah, N., Shiraishi, Y., Shiozawa, Y., Chiba, K., Tanaka, H., Koeffler, H. P., Klein, H. U., Dugas, M., … Ogawa, S. (2014). Landscape of genetic lesions in 944 patients with myelodysplastic syndromes. Leukemia, 28(2), 241–247. https://doi.org/10.1038/leu.2013.336.

[11] Makishima, H., Yoshizato, T., Yoshida, K., Sekeres, M. A., Radivoyevitch, T., Suzuki, H., Przychodzen, B., Nagata, Y., Meggendorfer, M., Sanada, M., Okuno, Y., Hirsch, C., Kuzmanovic, T., Sato, Y., Sato-Otsubo, A., LaFramboise, T., Hosono, N., Shiraishi, Y., Chiba, K., Haferlach, C., … Maciejewski, J. P. (2017). Dynamics of clonal evolution in myelodysplastic syndromes. Nature genetics, 49(2), 204–212. https://doi.org/10.1038/ng.3742.