Indian Journal of Pharmacy Practice., 2026; 19(1):120-122.
https://www.ijopp.org

Case Report

Effective Use of BV-AVD Regimen in the Management of Classical Hodgkin Lymphoma: A Case-Based Approach

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ABSTRACT

Classical Hodgkin Lymphoma (CHL) is a malignant lymphoproliferative disorder characterized by the presence of Reed-Sternberg cells(R-SC), which are large, multinucleated cells within an inflammatory microenvironment of immune cells, fibrosis, and necrosis. While its exact cause remains unclear, CHL is strongly associated with Epstein-Barr Virus (EBV) infection, genetic factors, and immune dysregulation. Common symptoms include fever, night sweats, unexplained weight loss, pruritus, fatigue, and hepatosplenomegaly. This report presents a rare case of CHL of mixed cellularity in a 35-year-old pregnant woman, who was admitted with generalized pruritus, joint pain, and bilateral upper lymphadenopathy. The diagnosis was confirmed through a PET-CT scan, bone marrow biopsy, and lymph node excision biopsy. The patient was initiated on cycle 1B chemotherapy with adriamycin, vinblastine, dacarbazine, and Brentuximab Vedotin (BV-AVD), along with supportive care and lifestyle modifications to ensure optimal maternal and fetal outcomes.

Keywords: Hodgkin lymphoma, PET-CT, BV-AVD regimen, Supportive Care.

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Received: 25-04-2025;
Revised: 09-06-2025;
Accepted: 18-08-2025.

INTRODUCTION

Hodgkin Lymphoma (HL) is a cancer of the lymphatic system that is characterized by the presence of distinctive multinucleated R-SC in an inflammatory cell background. It usually arises in lymph nodes and can progress to nearby nodal groups or extranodal sites like the spleen, liver, lungs, and bone marrow.[1] HL is generally divided into two broad categories: Classical Hodgkin Lymphoma (CHL) and Nodular Lymphocyte-Predominant Hodgkin Lymphoma (NLPHL), Nodular Sclerosis (NSCHL), Lymphocyte Rich (LRCHL), Mixed Cellularity (MCCHL), and Lymphocyte Depletion (LDCHL). Of these, CHL is the vast majority of cases, with the mixed cellularity type making up roughly 20-30% of all CHL diagnoses.[2] The classical Hodgkin lymphoma mixed cellularity subtype is characterized by an assortment of inflammatory cells in addition to RS cells. It is more frequently encountered among older or immunocompromised patients and is usually associated with EBV infection. Painful lymphadenopathy-most commonly in the neck, chest, or supraclavicular region-is the main clinical presentation and may be accompanied by B symptoms such as fever, night sweats, weight loss, and pruritus.[3] Diagnosis is established by excisional lymph node biopsy, which is followed by histopathological examination and immunophenotyping, with RS cells generally being positive for CD15 and CD30 antigens. Staging studies comprise PET-CT scans and bone marrow biopsy when required.[4] Treatment for CHL is stage-based and risk factor-dependent. Initial treatment usually consists of multi-agent chemotherapy like the ABVD regimen (Adriamycin, Bleomycin, Vinblastine, Dacarbazine). In selected patients, particularly those with CD30 positivity, Brentuximab Vedotin (BV) can be added. Radiotherapy can be added to bulky or localized diseases. Prognosis is good with high cure rates, particularly in early-stage disease.[5] This report discusses a case of a 35-year-old pregnant woman diagnosed with CHL of mixed cellularity.

CASE PRESENTATION

A 35-year-old pregnant woman presented with generalized itching, joint pain, and bilateral upper lymphadenopathy. The patient reported a recent abortion. On examination, the patient was conscious, oriented, and afebrile, with a Blood Pressure of 100/70 mmHg, Pulse Rate of 88/min, SpO_2 of 100% on room air, and a temperature of 98.4°F. Systemic examination revealed normal cardiovascular and respiratory findings, a soft abdomen, and palpable bilateral upper lymph nodes. A whole-body PET-CT scan showed multiple enlarged hypermetabolic retroperitoneal and pelvic lymph nodes, mildly enlarged hypermetabolic mediastinal and cervical lymph nodes, splenomegaly with diffuse hypermetabolism, and reactive mild diffuse Fluorodeoxyglucose (FDG) uptake in the marrow of the axial skeleton. No other

DOI: 10.5530/ijopp.20260387

metabolically active lesions were noted and excision biopsy of the inguinal lymph node showed membranous positivity for CD-20 and CD-30, dim nuclear positivity for PAX-5, and negativity for CD-15, CD-45, CD-4, CD-10, BCL-6, CD-23, ALK-1, CD2, CD3, CD5, and CD8. This confirmed CHL of mixed cellularity. The bone marrow biopsy shows no evidence of HL infiltration. The patient was initiated on cycle 1B chemotherapy for CHL, including a combination of adriamycin, vinblastine, dacarbazine, and Brentuximab Vedotin (BV-AVD) as shown in Table 1.

To support hematopoiesis, subcutaneous injections of Filgrastim 300 mcg daily for three days were administered. Oral medications included T. Ondansetron 8 mg T. Pantoprazole + Domperidone**,** Syp. Liquid Paraffin + Milk of Magnesia, L-Glutamine, T. Etoricoxib + Thiocolchicoside 60 mg and T. Fexofenadine 180 mg. Symptomatic treatments were also prescribed, including Loperamide hydrochloride**,** Hyoscine butylbromide, Choline salicylate + Lidocaine**,** and Benzydamine hydrochloride gargles. Antibiotics, including Cap Amoxicillin + Clavulanic acid 625 mg and T. Levofloxacin 500 were added. The patient was counseled to maintain a high-protein diet, drink 2.5-3 L of fluids daily, avoid spicy and oily foods to support overall treatment and recovery.

DISCUSSION

CHL is a type of lymphatic system cancer, it accounts approximately 10-15% of all lymphomas globally whereas in India it reports the higher proportion of 22.5-30.35%.[6] According to Shenoy *et al.*, (2011) and Martínez *et al.*, (2024), CHL are most commonly characterized by B symptoms-fever, night sweats, and unexplained weight loss.[7,8] Additionally, studies by Biggar *et al.*, (2019) have reported pruritus as an early indicator of CHL in up to 30% of patients, often preceding lymphadenopathy.[9] According to the guidelines by Eichenauer *et al.*, (2018) and the recommendation of the National Comprehensive Cancer Network (NCCN), the diagnostic approach for Hodgkin lymphoma emphasizes the use of both imaging and histological assessment. A lymph node excisional biopsy is considered the gold standard for confirming the diagnosis, as it allows for the clear identification of Reed-Sternberg cells. For staging, a PET-CT scan is strongly recommended due to its high sensitivity in detecting both nodal and extranodal disease.[10,11] Shanbhag and Ambinder (2018) further emphasized the importance of immunohistochemistry, particularly the expression of CD30 and PAX-5.[12] According to Nathwani et al. (2000) CD30+ and PAX-5 dim are typical markers seen in CHL, used to identify RS cells. CD20+ is less commonly seen in CHL, but it does occur in a significant minority of cases (about 20-30%).[13] In this case, the protein expression analysis of the lymph node biopsy in the laboratory was positive for certain proteins (CD20 and CD30) on the surface of cancer cells and another Protein (PAX-5) within the nucleus, but in reduced quantity. These details are supportive of the diagnosis of CHL. Studies such as Connors *et al.*, (2018) and Harker-Murray *et al.*, (2023) have shown that BV + AVD yields higher progression-free survival, especially in advanced-stage or high-risk patients.[14,15] This aligns with the standard treatment guidelines (STG) of the National Comprehensive Cancer Network (NCCN) which suggest 6 cycles of BV-AVD regimen for every 28 days as a standard treatment.[16] This case report is limited by a few issues, such as being on a single patient, which hinders generalizability. The absence of long-term follow-up precludes evaluation of possible complications or CHL recurrence.

Table 1: BV-AVD Regimen.

Drug	Dose	Route of Administration
Inj.Adriamycin	34 mg	IV infusion
Inj.Vinblastine	8 mg	IV bolus
Inj.Dacarbazine	500 mg	IV infusion
Inj.Brentuximab Vedotin	50 mg	IV infusion

CONCLUSION

We present a case of a 35-year-old pregnant woman diagnosed with CHL of mixed cellularity subtype. This case underscores the critical importance of a multidisciplinary approach in the diagnosis and management of hematologic malignancies during pregnancy, where maternal and fetal well-being must be simultaneously considered. Diagnosis was established through PET-CT and histopathological evaluation via excisional biopsy. The patient was managed with a modified chemotherapy regimen, alongside supportive care, including growth factor support and nutritional counselling. This case adds to the growing body of literature that highlights the feasibility and safety of tailored oncologic therapies during pregnancy. Early detection, individualised treatment planning, and close monitoring ensure favourable maternal and fetal outcomes. Routine antenatal care, patient education, and awareness of warning signs remain vital in facilitating timely intervention and optimising prognosis in such complex clinical scenarios.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the subject involved in this case report. We would especially like to thank the clinical team for their invaluable clinical support and advice in the preparation of this report.

CONFLICT OF INTEREST

The authors declare that there is no Conflict of Interest.

ABBREVIATIONS

CHL: Classical Hodgkin Lymphoma; **EBV:** Epstein-Barr Virus; **HL:** Hodgkin Lymphoma; **NLPHL:** Nodular Lymphocyte-Predominant Hodgkin Lymphoma; **NSCHL:**

Nodular Sclerosis Classical Hodgkin Lymphoma; **LRCHL:** Lymphocyte-Rich Classical Hodgkin Lymphoma; **MCCHL:** Mixed Cellularity Classical Hodgkin Lymphoma; **LDCHL:** Lymphocyte Depletion Classical Hodgkin Lymphoma; **RSC:** Reed-Sternberg Cells; **PET-CT:** Positron Emission Tomography-Computed Tomography; **FDG:** Fluorodeoxyglucose; **IV:** Intravenous; **BV-AVD:** Brentuximab Vedotin-Adriamycin, Vinblastine, Dacarbazine; **Inj.:** Injection; **T.:** Tablet; **Syp.:** Syrup; **SpO_2:** Peripheral Capillary Oxygen Saturation; **CD:** Cluster of Differentiation (e.g., CD15, CD30, etc.); **PAX-5:** Paired Box Protein 5; **ALK-1:** Anaplastic Lymphoma Kinase 1; **BCL-6:** B-Cell Lymphoma 6; **NCCN:** National Comprehensive Cancer Network; **STG:** Standard Treatment Guidelines.

PATIENT CONSENT

In alignment with established ethical standards, informed consent was secured from the patient. The consent specifically permitted the utilization of the patient's clinical information for publication, with a commitment to uphold confidentiality and safeguard the patient's privacy in all disseminated materials.

SUMMARY

A 35-year-old pregnant woman presented to the hospital with B symptoms and was diagnosed with Classical Hodgkin Lymphoma (CHL) of the mixed cellularity subtype, confirmed through an excisional biopsy of the inguinal lymph node. She was subsequently treated with the BV-AVD chemotherapy regimen and also supportive therapy. Timely diagnosis, tailored treatment strategies, and vigilant monitoring are crucial to achieving positive outcomes for both the mother and the fetus.

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Cite this article: Sasikumar S, Anandan M, Alan D, Kothandan D. Effective Use of BV-AVD Regimen in the Management of Classical Hodgkin Lymphoma: A Case-Based Approach. Indian J Pharmacy Practice. 2026;19(1):120-2.