

Review Article

CNS Lymphoma: A Review

Dennis Adjepong, MD, MBA* 

Department of Neurological Surgery, California Institute of Behavioral Neurosciences & Psychology, Fairfield, USA

Abstract

CNS lymphoma is a rare form of the extra-nodal non-Hodgkin lymphoma that is primarily confined to the brains, the eyes, and the cerebrospinal fluid without any existing knowledge or evidence of a systematic kind of spread. The patient's prognosis with the illness has, over time, improved notably during the last decade following the introduction of the higher doses of the methotrexate. However, despite this new kind of progress, the results after the treatments are durable in half of the population of those suffering from the disorder. The therapy can, however, be associated with considerably late neurotoxicity.

Keywords: Extra-nodal; Lymphoma; Methotrexate; Neurotoxicity; Non-Hodgkin; Tumor

Introduction

The CNS lymphoma is considered a rare non-Hodgkin type of lymphoma in which the malignant or the cancer cells from the body lymphoid systems form in the brain and or the spinal cord [1,2]. It can also spread parts of the body [3]. Due to the fact the eye is also located next to the brain, the diseases can even start on the eyes, and this is called ocular lymphoma [4]. Cancer can also involve, in other cases, the spinal fluid that bathes the spinal cord and the brain [5]. This type of lymphoma is termed as the leptomeningeal lymphoma. Both the primary and secondary forms of lymphoma are very rare. Because the disease is uncommon, the median diagnoses of the disorders stand at 55 years [6-8].

Methods

The study includes examining, analyzing, and reviewing the various healthcare journals and article which are related to the disease

*Corresponding author: Dennis Adjepong, Department of Neurological Surgery, California Institute of Behavioral Neurosciences & Psychology, Fairfield, USA, Tel: +1 5712771998; E-mail: adjepongdenis1@gmail.com

Citation: Adjepong D (2020) CNS Lymphoma: A Review. J Surg Curr Trend Innov 4: 033.

Received: April 03, 2020; Accepted: May 03, 2020; Published: May 11, 2020

Copyright: © 2020 Adjepong D. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

progression. Because the condition is scarce, it becomes almost impossible to conduct a primary analysis or research from a patient suffering from the condition. The method will, therefore, do a review of the various secondary sources to developed people understanding of the disease [9].

Results

From the review of healthcare journals and articles on CNS lymphoma, the exact cause of the CNS lymphoma has not been established [10-12]. However, according to the various researches conducted, it is believed that multiple factors might increase the overall individual risk factor of the disease [13]. This includes having compromised immunity as a result of HIV or organ transplant [14].

Discussion

Pathophysiology of CNS lymphoma

Pathology does reveal proliferative cancer cells in an angiogenic kind of evolution formulae, actively sensitive to the CNS [15]. Several of the CNS lymphoma forms are a large diffuse form of B-cells lymphoma and Burkitt lymphoma. Gene-expression profiling has, in the long run, acknowledged three molecular subsections of CNS lymphoma [16]. This includes germinal center B-cells and activated B-cells. The discoloration of the CNS with antibodies that works to differentiate the CNS subgroups did indicate that the most significant number of the CNS lymphoma forms were not germinal center subtype [17]. The CNS lymphoma is linked with the worse outcomes and frequent type of alterations in the B-cells pathway of receptors. In the same cohort, the B-cells receptor signaling axis with the downstream kind of targets is exaggerated by the actual frequency of the mutation that recur over some time and which are MYD88 and the CD79B.

Biochemistry of lymphoma

The lymphatic system plays a critical role in the body's immune system. It is made up of spleen, tonsils, and lymph nodes [18]. The immune system also has a white blood cell that is referred to as the lymphocytes. The function of lymphocyte is to fight infections in the organ systems. If the cells become cancerous, they can result in the lymphoma [19]. Lymphoma disease is rare in women than in men, and the prevalence is considerably higher for individuals who have AIDS [20].

Genetics of the disease

The genes implicated in CNS lymphoma progression are IgH, Bcl-6, and TP53 [21]. The precise fundamental source of CNS lymphoma is not adequately understood; yet, individuals with a debilitated immune system or who have their spleen removed have an enlarged peril of evolving complaint [22].

Clinical implication

CNS lymphoma is a rare condition and even more in women in the general population. The impact of the disease very dire. If not

adequately dealt with at the right time, the disorders are particularly important in the whole body weakness and can affect the specific areas of the body [23]. The condition is usually associated with severe headaches, seizures, and problems that are related to the vision and the balance of the patient [24]. For most people, the symptom of the disease might include the inability to focus or concentrate on a given aspect of life [25]. The risk of developing a post-transplant lymphoma is higher due to the low immune system that is produced by such activities. In this way, the disorder can result in the death of the patient, especially when the individuals are HIV positive [26].

Scientific analysis of CNS lymphoma

The paper was developed from an article written by Panageas et al., and Karimi et al., [26-28]. The first article by Karimi et al., [28] did highlight much information concerning the disorder but did little in answering the question concerning the treatment and the case of the disease [29]. However, the second article did much on the treatment of the CNS lymphoma. Preference was given to the second article by Karimi et al., [28]. Over the first article since it is more detailed in explaining disease pathophysiology and the future perspectives [30].

Limitation of the study

The answered question, which has not been answered concerning the CNS lymphoma, is the actual cause of the disease [31]. With various researches suggesting the various risk factors of the conditions, the real cause of the disease remains a mystery, with many of the studies indicating the median age for individuals suffering from the disorders stands at 55 years [9]. The prevalence is considerably higher among those who have AIDS; however, the actual cause of the disease is not well known [32,33].

Conclusion

The CNS lymphoma is a rare condition or the rare CNS neoplasm. It is, however highest incidence in the older adult and the immunocompromised persons, especially those who have the HIV/AIDS of persons who had transplantation of body organs. In the past, there exists a critical difference in the presentation and the evaluations of the immune-potent patients and those of the immune-compromised patients. The diagnostic pitfalls in this very uncommon tumor can often result in a missed or delayed diagnosis. This often results in delayed management or additional treatment of the disease. Once it is initiated, therapeutic management most often centers on the systematic kind of chemotherapy. The condition does not affect many people all over the world, and the real causal factor is yet to be established.

References

- Ferreri AJM, Cwynarski K, Palczynski E, Ponzoni M, Deckert M, et al. (2016) Chemoimmunotherapy with methotrexate, cytarabine, thiopeta, and rituximab (MATRix regimen) in patients with primary CNS lymphoma: Results of the first randomisation of the International Extranodal Lymphoma Study Group-32 (IELSG32) phase 2 trial. *The Lancet Haematology* 3: 217-227.
- Hoang-Xuan K, Bessell E, Bromberg J, Hottinger AF, Preusser M, et al. (2015) Diagnosis and treatment of primary CNS lymphoma in immunocompetent patients: Guidelines from the European Association for Neuro-Oncology. *The Lancet Oncology* 16: 322-332.
- Rubenstein JL, Wong VS, Kadoch C, Gao HX, Barajas R, et al. (2013) CXCL13 plus interleukin 10 is highly specific for the diagnosis of CNS lymphoma. *Blood* 121: 4740-4748.
- Korfel A, Schlegel U (2013) Diagnosis and treatment of primary CNS lymphoma. *Nat Rev Neurol* 9: 317-327.
- Lionakis MS, Dunleavy K, Roschewski M, Widemann BC, Butman JA, et al. (2017) Inhibition of B cell receptor signaling by ibrutinib in primary CNS lymphoma. *Cancer cell* 31: 833-843.
- Rubenstein JL, Hsi ED, Johnson JL, Jung SH, Nakashima MO, et al. (2013) Intensive chemotherapy and immunotherapy in patients with newly diagnosed primary CNS lymphoma: CALGB 50202 (Alliance 50202). *J Clin Oncol* 31: 3061-3068.
- Phillips EH, Fox CP, Cwynarski K (2014) Primary CNS lymphoma. *Curr Hematol Malig Rep* 9: 243-253.
- Doolittle ND, Korbel A, Lubow MA, Schorb E, Schlegel U, et al. (2013) Long-term cognitive function, neuroimaging, and quality of life in primary CNS lymphoma. *Neurology* 81: 84-92.
- Ferreri AJ, Cwynarski K, Palczynski E, Fox CP, Schorb E, et al. (2017) Whole-brain radiotherapy or autologous stem-cell transplantation as consolidation strategies after high-dose methotrexate-based chemoimmunotherapy in patients with primary CNS lymphoma: Results of the second randomisation of the International Extranodal Lymphoma Study Group-32 phase 2 trial. *Lancet Haematol* 4: 510-523.
- Grommes C, Pastore A, Palaskas N, Tang SS, Campos C, et al. (2017) Ibrutinib Unmasks Critical Role of Bruton Tyrosine Kinase in Primary CNS Lymphoma. *Cancer Discov* 7: 1018-1029.
- Korea A, Thiel E, Martus P, Möhle R, Griesinger F, et al. (2015) Randomized phase III study of whole-brain radiotherapy for primary CNS lymphoma. *Neurology* 84: 1242-1248.
- Taylor JW, Flanagan EP, O'Neill BP, Siegal T, Omuro A, et al. (2013) Primary leptomeningeal Lymphoma: international primary CNS lymphoma collaborative group report. *Neurology* 81: 1690-1696.
- Korea A, Schlegel U, Herrlinger U, Dreyling M, Schmidt C, et al. (2016) Phase II trial of temsirolimus for relapsed/refractory primary CNS lymphoma. *J Clin Oncol* 34: 1757-1763.
- Yamashita K, Yoshiura T, Hiwatashi A, Togo O, Yoshimoto K, et al. (2013) Differentiating primary CNS lymphoma from glioblastoma multiforme: Assessment using arterial spin labeling, diffusion-weighted imaging, and ¹⁸F-fluorodeoxyglucose positron emission tomography. *Neuroradiology* 55: 135-143.
- Doolittle ND, Korbel A, Lubow MA, Schorb E, Schlegel U, et al. (2013) Long-term cognitive function, neuroimaging, and quality of life in primary CNS lymphoma. *Neurology* 81: 84-92.
- Houllier C, Choquet S, Touitou V, Martin-Duverneuil N, Navarro S, et al. (2015) Lenalidomide monotherapy as salvage treatment for recurrent primary CNS lymphoma. *Neurology* 84: 325-326.
- Gregory G, Arumugaswamy A, Leung T, Chan KL, Abikhair M, et al. (2013) Rituximab is associated with improved survival for aggressive B cell CNS lymphoma. *Neuro oncol* 15: 1068-1073.
- Partovi S, Karimi S, Lyo JK, Esmaeili A, Tan J, et al. (2014) Multimodality imaging of primary CNS lymphoma in immunocompetent patients. *Br J Radiol* 87: 20130684.
- Kickingeder P, Sahn F, Wiestler B, Roethke M, Heiland S, et al. (2014) Evaluation of microvascular permeability with dynamic contrast-enhanced MRI for the differentiation of primary CNS lymphoma and glioblastoma: Radiologic-pathologic correlation. *AJNR Am J Neuroradiol* 35: 1503-1508.
- Fritsch K, Kasenda B, Schorb E, Hau P, Bloehdorn J, et al. (2017) High-dose methotrexate-based immuno-chemotherapy for elderly primary CNS lymphoma patients (PRIMAIN study). *Leukemia* 31: 846-852.

21. Omuro A, Chinot O, Taillandier L, Ghesquieres H, Toussaint C, et al. (2015) Methotrexate and temozolomide versus methotrexate, procarbazine, vincristine, and cytarabine for primary CNS lymphoma in an elderly population: an intergroup ANOCEF-GOELAMS randomised phase 2 trial. *Lancet Haematol* 2: 251-259.
22. Mansour A, Qandeel M, Abdel-Razeq H, Ali HAA (2014) MR imaging features of intracranial primary CNS lymphoma in immune competent patients. *Cancer Imaging* 14: 22.
23. Illerhaus G, Kasenda B, Short G, Egerer G, Lamprecht M, et al. (2016) High-dose chemotherapy with autologous haemopoietic stem cell transplantation for newly diagnosed primary CNS lymphoma: a prospective, single-arm, phase 2 trial. *Lancet Haematology* 3: 388-397.
24. Schob S, Meyer J, Gawlitza M, Frydrychowicz C, Müller W, et al. (2016) Diffusion-weighted MRI reflects proliferative activity in primary CNS lymphoma. *PLoS One* 11: 0161386.
25. Chamoun K, Choquet S, Boyle E, Houllier C, Larrieu-Ciron D, et al. (2017) Ibrutinib monotherapy in relapsed/refractory CNS lymphoma: a retrospective case series. *Neurology* 88: 101-102.
26. Omuro A, Correa DD, DeAngelis LM, Moskowitz CH, Matasar MJ, et al. (2015) R-MPV followed by high-dose chemotherapy with TBC and autologous stem-cell transplants for newly diagnosed primary CNS lymphoma. *Blood* 125: 1403-1410.
27. Rubenstein JL, Li J, Chen L, Advani R, Drappatz J, et al. (2013) Multi-center phase I trial of intraventricular immunochemotherapy in recurrent CNS lymphoma. *Blood* 121: 745-751.
28. Morris PG, Correa DD, Yahalom J, Raizer JJ, Schiff D, et al. (2013) Rituximab, methotrexate, procarbazine, and vincristine followed by consolidation reduced-dose whole-brain radiotherapy and cytarabine in newly diagnosed primary CNS lymphoma: Final results and long-term outcome. *J Clin Oncol* 31: 3971-3979.
29. Ferreri AJ, Donadoni G, Cabras MG, Patti C, Mian M, et al. (2015) High doses of antimetabolites followed by high-dose sequential chemoimmunotherapy and autologous stem-cell transplantation in patients with systemic B-cell Lymphoma and secondary CNS involvement: final results of a multicenter phase II trial. *J Clin Oncol* 33: 3903-3910.
30. Li Z, Qiu Y, Personett D, Huang P, Edenfield B, et al. (2013) Pomalidomide shows significant therapeutic activity against CNS lymphoma with a major impact on the tumor microenvironment in murine models. *PLoS One* 8: 71754.
31. Glass J, Won M, Schultz CJ, Brat D, Bartlett NL, et al. (2016) Phase I and II study of induction chemotherapy with methotrexate, rituximab, and temozolomide, followed by whole-brain radiotherapy and postirradiation temozolomide for primary CNS lymphoma: NRG Oncology RTOG 0227. *J Clin Oncol* 34: 1620-1625.
32. Chamberlain MC (2014) Salvage therapy with bendamustine for methotrexate refractory recurrent primary CNS lymphoma: A retrospective case series. *J Neurooncol* 118: 155-162.
33. Choquet S, Houllier C, Bijou F, Houot R, Boyle E, et al. (2016) Ibrutinib Monotherapy in Relapse or Refractory Primary CNS Lymphoma (PCNSL) and Primary Vitreo-Retinal Lymphoma (PVRL). Result of the Interim Analysis of the iLOC Phase II Study from the Lysa and the French LOC Network. *Blood* 128: 784.



- Advances In Industrial Biotechnology | ISSN: 2639-5665
- Advances In Microbiology Research | ISSN: 2689-694X
- Archives Of Surgery And Surgical Education | ISSN: 2689-3126
- Archives Of Urology
- Archives Of Zoological Studies | ISSN: 2640-7779
- Current Trends Medical And Biological Engineering
- International Journal Of Case Reports And Therapeutic Studies | ISSN: 2689-310X
- Journal Of Addiction & Addictive Disorders | ISSN: 2578-7276
- Journal Of Agronomy & Agricultural Science | ISSN: 2689-8292
- Journal Of AIDS Clinical Research & STDs | ISSN: 2572-7370
- Journal Of Alcoholism Drug Abuse & Substance Dependence | ISSN: 2572-9594
- Journal Of Allergy Disorders & Therapy | ISSN: 2470-749X
- Journal Of Alternative Complementary & Integrative Medicine | ISSN: 2470-7562
- Journal Of Alzheimers & Neurodegenerative Diseases | ISSN: 2572-9608
- Journal Of Anesthesia & Clinical Care | ISSN: 2378-8879
- Journal Of Angiology & Vascular Surgery | ISSN: 2572-7397
- Journal Of Animal Research & Veterinary Science | ISSN: 2639-3751
- Journal Of Aquaculture & Fisheries | ISSN: 2576-5523
- Journal Of Atmospheric & Earth Sciences | ISSN: 2689-8780
- Journal Of Biotech Research & Biochemistry
- Journal Of Brain & Neuroscience Research
- Journal Of Cancer Biology & Treatment | ISSN: 2470-7546
- Journal Of Cardiology Study & Research | ISSN: 2640-768X
- Journal Of Cell Biology & Cell Metabolism | ISSN: 2381-1943
- Journal Of Clinical Dermatology & Therapy | ISSN: 2378-8771
- Journal Of Clinical Immunology & Immunotherapy | ISSN: 2378-8844
- Journal Of Clinical Studies & Medical Case Reports | ISSN: 2378-8801
- Journal Of Community Medicine & Public Health Care | ISSN: 2381-1978
- Journal Of Cytology & Tissue Biology | ISSN: 2378-9107
- Journal Of Dairy Research & Technology | ISSN: 2688-9315
- Journal Of Dentistry Oral Health & Cosmesis | ISSN: 2473-6783
- Journal Of Diabetes & Metabolic Disorders | ISSN: 2381-201X
- Journal Of Emergency Medicine Trauma & Surgical Care | ISSN: 2378-8798
- Journal Of Environmental Science Current Research | ISSN: 2643-5020
- Journal Of Food Science & Nutrition | ISSN: 2470-1076
- Journal Of Forensic Legal & Investigative Sciences | ISSN: 2473-733X
- Journal Of Gastroenterology & Hepatology Research | ISSN: 2574-2566
- Journal Of Genetics & Genomic Sciences | ISSN: 2574-2485
- Journal Of Gerontology & Geriatric Medicine | ISSN: 2381-8662
- Journal Of Hematology Blood Transfusion & Disorders | ISSN: 2572-2999
- Journal Of Hospice & Palliative Medical Care
- Journal Of Human Endocrinology | ISSN: 2572-9640
- Journal Of Infectious & Non Infectious Diseases | ISSN: 2381-8654
- Journal Of Internal Medicine & Primary Healthcare | ISSN: 2574-2493
- Journal Of Light & Laser Current Trends
- Journal Of Medicine Study & Research | ISSN: 2639-5657
- Journal Of Modern Chemical Sciences
- Journal Of Nanotechnology Nanomedicine & Nanobiotechnology | ISSN: 2381-2044
- Journal Of Neonatology & Clinical Pediatrics | ISSN: 2378-878X
- Journal Of Nephrology & Renal Therapy | ISSN: 2473-7313
- Journal Of Non Invasive Vascular Investigation | ISSN: 2572-7400
- Journal Of Nuclear Medicine Radiology & Radiation Therapy | ISSN: 2572-7419
- Journal Of Obesity & Weight Loss | ISSN: 2473-7372
- Journal Of Ophthalmology & Clinical Research | ISSN: 2378-8887
- Journal Of Orthopedic Research & Physiotherapy | ISSN: 2381-2052
- Journal Of Otolaryngology Head & Neck Surgery | ISSN: 2573-010X
- Journal Of Pathology Clinical & Medical Research
- Journal Of Pharmacology Pharmaceutics & Pharmacovigilance | ISSN: 2639-5649
- Journal Of Physical Medicine Rehabilitation & Disabilities | ISSN: 2381-8670
- Journal Of Plant Science Current Research | ISSN: 2639-3743
- Journal Of Practical & Professional Nursing | ISSN: 2639-5681
- Journal Of Protein Research & Bioinformatics
- Journal Of Psychiatry Depression & Anxiety | ISSN: 2573-0150
- Journal Of Pulmonary Medicine & Respiratory Research | ISSN: 2573-0177
- Journal Of Reproductive Medicine Gynaecology & Obstetrics | ISSN: 2574-2574
- Journal Of Stem Cells Research Development & Therapy | ISSN: 2381-2060
- Journal Of Surgery Current Trends & Innovations | ISSN: 2578-7284
- Journal Of Toxicology Current Research | ISSN: 2639-3735
- Journal Of Translational Science And Research
- Journal Of Vaccines Research & Vaccination | ISSN: 2573-0193
- Journal Of Virology & Antivirals
- Sports Medicine And Injury Care Journal | ISSN: 2689-8829
- Trends In Anatomy & Physiology | ISSN: 2640-7752

Submit Your Manuscript: <https://www.heraldopenaccess.us/submit-manuscript>