Physical Education, Health and Social Sciences

https://journal-of-social-education.org

E-ISSN: 2958-5996
P-ISSN: 2958-5988

Chronic Neutrophilic Leukocytosis and Elevated Liver Enzymes with Persistent Body Ache: A Diagnostic Challenge

Zeeshan Ahmed [1], Ghulam Muhammad [2], Mehtab Mehboob [3], Narjis Shahid [4]

[1,2,3,4] Ziauddin University, faculty of Nursing and Midwifery, Karachi, Pakistan Email: zeeshan.25817@zu.edu.pk
Corresponding Author: Zeeshan Ahmed

DOI: https://doi.org/10.63163/jpehss.v3i2.256

Abstract
A 20-year-old nursing student reported experiencing intense body pains for the last two years, which worsened at night but showed some relief during the day. He also had elevated liver enzymes (SGPT: 216 U/L), and neutrophilic leukocytosis. Despite undergoing multiple tests, including bone marrow biopsy, genetic analysis (NGS panel of BCR-ABL, JAK2, and myeloid genes, and an autoimmune profile, a definitive diagnosis could not be reached. The patient developed body rashes, weight gain, high blood pressure, and mood swings, likely due to prolonged use of multiple antibiotics and, more recently corticosteroids. The patient's body aches and rashes have persisted as chronic symptoms. The challenges highlight the challenges in the diagnosis of individuals with unexplained neutrophilic leukocytosis and underscore the need for further studies on the etiology, including lymph node involvement.

Introduction
In adults, the white blood cell (WBC) count typically ranges from 4,000 to 11,000 cells/mm3, a count exceeding 11,000 cells/mm3 indicates leukocytosis (1). In adults, neutrophilia is defined as the neutrophil count greater than 7,500 cells/L. Since neutrophil levels vary with age; this definition does not apply to children.
The term "chronic idiopathic neutrophil" (CIN) describes a condition in which neutrophilia persists for years in otherwise healthy people. CIN is rarely discussed in scientific literature. Having said that, in some patients, no identifiable cause is detected, and the diagnosis of chronic idiopathic neutrophilia (CIN) is made (2).
Neutrophilic leukocytosis is frequently associated with hematologic malignancies, infections, or inflammatory diseases. Chronic neutrophilic leukemia (CNL), a rare and often aggressive myeloproliferative neoplasm (MPN), is characterized by persistent mature neutrophilic leukocytosis, bone marrow granulocyte hyperplasia, and frequent hepatosplenomegaly (3).
Here we present the case of a 23-year-old man with persistent neutrophilic leukocytosis, elevated liver enzymes, and chronic pain. This case illustrates the challenges in the diagnosis and management of such patients, particularly when the standard investigations fail to determine the underlying cause. Although not immediately, the possibility of lymph node involvement is also considered (4)

Case Presentation
A nursing student in his 20s reported experiencing severe body aches for the past two years, primarily at night, with some alleviation during the day. He also suffered from body rashes and fatigue. There was no family history of hematologic diseases or similar symptoms. The patient denied drug use, alcohol consumption, or smoking. He was not on any regular medication and had no significant medical history. Initial laboratory test revealed Neutrophil leukocytosis (white blood cell count: 14.3–26.2 ×

10^9/L) and elevated liver enzymes (serum glutamic-pyruvic transaminase: 216 U/L). A fatty liver was detected through abdominal ultrasonography. Serologic tests for hepatitis B, hepatitis C, AND HIV were negative. After one month of corticosteroid treatment (prednisolone), the patient's symptoms did not improve, however, he developed weight gain, mood changes, body rashes, and hypertension.

Investigations

The patient underwent a diagnostic workup, which included the following:

Bone marrow tests were negative for myeloproliferative neoplasm panels, BCR-ABL, and JAK2.

Autoimmune profile: ANA, AMA, ASMA, AGPCA, RA factor, and Anti-CCP were within normal limits.

Infectious workup: Serologic tests for HIV, hepatitis B, and hepatitis C viral profiles were negative.

Endocrine and metabolic studies: Serum vitamin D, lipid profile, thyroid profile, and HbA1C were within normal ranges.

Genetic testing: Myeloid gene panels (DNA, RNA) using next-generation sequencing (NGS) detected no anomalies.

Imaging: A fatty liver was discovered on ultrasound.

Additional tests revealed that CRP, LFTs (except SGPT, which was elevated), and serum ferritin (222 mg/mL) were within normal ranges.

Despite extensive testing, no definitive diagnosis was established.

Laboratory Findings:

SGPT was elevated (216 U/L), while alkaline phosphatase and bilirubin levels were normal. On WBC morphology showed Neutrophilic leukocytosis (WBC: 14.3–26.2 x 10^9/L). Serum electrolytes, urea, creatinine, and albumin levels were within normal ranges. Bone marrow biopsy showed no evidence of malignancy or myeloproliferative disorders. Genetic testing: NGS detected no mutations in myeloid gene panels (DNA, RNA).

Differential Diagnosis

1. Chronic idiopathic neutrophilia (CIN) is defined as persistent neutrophilia with no identifiable cause. (2).
2. Neutrophilic leukocytosis is not associated with non-alcoholic fatty liver disease (NAFLD), a condition marked by elevated liver enzymes and fatty infiltration on ultrasonography (5).
3. Autoimmune or inflammatory disorder: An atypical presentation of an autoimmune disease cannot be ruled out, even if autoimmune markers are negative (6).
4. Hematologic disorder: Other rare hematologic condition remains possible, although, myeloproliferative disorders have been ruled out (7).
5. Despite no sign of an active infection, low-grade or chronic infections cannot be entirely ruled out (8)

Lymph node disorders: Given the prolonged symptoms and neutrophilic leukocytosis, occult lymph node conditions, such as lymphoma or reactive lymphadenopathy, remain possible despite no lymphadenopathy detected on physical examination or imaging (9).

Treatment

The patient was empirically treated with several antibiotics, including meropenem, piperacillin, and tazobactam, but showed no significant improvement. The one-month course of corticosteroids (prednisolone), failed to relieve body aches but caused body rashes mood fluctuations, weight gain, and hypertension. As the symptom persists, the patient continues to receive medical treatment.

Outcome and Follow-Up

The patient continues to experience a persistent body rash and a recurring nightly body ache. Follow-up investigations have yielded no new findings. He remains under close observation, with plans to further evaluate for rare or unidentified conditions, including lymph node abnormalities.

Discussion

This presents a diagnostic dilemma since no apparent cause of the patient's symptoms has been identified. Neutrophilic leukocytosis, abnormal liver enzymes, and chronic pain are nonspecific indicators of various diseases (1, 2). Normal findings on bone marrow studies, autoimmune panel, and genetic testing rule out potentially novel or unidentified diseases (3). The role of Fatty liver in the process remains unclear, although it may contribute to elevated liver enzymes (5).

Lymphadenopathy may present with or without systemic symptoms, leading to different diagnostic considerations. Example: Occult lymph node disease may present with systemic symptoms such as fatigue, night sweats, and unexplained leukocytosis. To rule out lymph node disease, further imaging studies such as CT or PET may be required (9).

Learning Points/Take Home Message

1. Unexplained neutrophilic Leukocytosis and chronic pain require a comprehensive differential diagnosis and thorough investigation (1, 3).
2. Fatty liver and elevated liver enzymes may be incidental findings, but their progression should be closely monitored (5).
3. Empirical treatments such as antibiotics and corticosteroids may not always be effective and may cause significant side effects (6).
4. Persistent neutrophilic leukocytosis even in the absence of palpable lymphadenopathy, should prompt evaluation for lymph node diseases (9).

Unexplained symptoms may have l underlying mechanisms that require further investigations (2).

References:

Widick P, Winer ES. Leukocytosis and leukemia. Primary care. 2016 Dec;43(4):575-87.

Miniero R, Mazza GA, Altomare F, Fusaro C. Chronic idiopathic neutrophilia in two twins. Case Reports in Hematology. 2014;2014(1):785454.

Szuber N, Elliott M, Tefferi A. Chronic neutrophilic leukemia: 2022 update on diagnosis, genomic landscape, prognosis, and management. American journal of hematology. 2022 Apr;97(4):491-505.

Otieno SB, Altahan A, Karri S, Kaweeta F, Lands L, Weir A. CIN or not: An approach to the evaluation and management of chronic idiopathic neutrophilia. Blood reviews. 2021 Mar 1;46:100739.

Younossi ZM, Koenig AB, Abdelatif D, Fazel Y, Henry L, Wymer M. Global epidemiology of nonalcoholic fatty liver disease—meta-analytic assessment of prevalence, incidence, and outcomes. Hepatology. 2016 Jul 1;64(1):73-84.

Clauw DJ. Fibromyalgia: a clinical review. Jama. 2014 Apr 16;311(15):1547-55.

Tefferi A, Vardiman JW. Classification and diagnosis of myeloproliferative neoplasms: the 2008 World Health Organization criteria and point-of-care diagnostic algorithms. Leukemia. 2008 Jan;22(1):14-22.

Padian NS, Washington AE. Pelvic inflammatory disease: a brief overview. Annals of epidemiology. 1994 Mar 1;4(2):128-32.

Cheson BD, Fisher RI, Barrington SF, Cavalli F, Schwartz LH, Zucca E, Lister TA. Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: the Lugano classification. Journal of clinical oncology. 2014 Sep 20;32(27):3059-67.