A Case Report on Tofacitinib-Induced Leukopenia and Thrombocytopenia in a Patient with Seronegative Rheumatoid Arthritis and Interstitial Lung Disease

OPIS PRZYPADKU LEUKOPENII I MAŁOPŁYTKOWOŚCI WYWOŁANYCH STOSOWANIEM TOFACITYNIBU U PACJENTA Z SERONEGATYWNYM REUMATOIDALNYM ZAPALENIEM STAWÓW I ŚRÓDMIĄŻSZOWĄ CHOROBĄ PŁUC

MUSKAN KUMARI[1], PARSHANT POKHRIYAL[1], DAMINI KHARB[1], SUBODH GURURANI[2], YOGESH JOSHI[1*]

[1]DEPARTMENT OF PHARMACY PRACTICE, SCHOOL OF PHARMACEUTICAL SCIENCES, SHRI GURU RAM RAI UNIVERSITY, DEHRADUN - 248001, UTTARAKHAND, INDIA.
[2]DEPARTMENT OF CLINICAL IMMUNOLOGY AND RHEUMATOLOGY, SHRI GURU RAM RAI INSTITUTE OF MEDICAL & HEALTH SCIENCES, SHRI GURU RAM RAI UNIVERSITY, DEHRADUN - 248001, UTTARAKHAND, INDIA.

* AUTOR KORESPONDENCYJNY

Streszczenie

Niniejszy opis przypadku opisuje 67-letniego mężczyznę z seronegatywnym reumatoidalnym zapaleniem stawów (RZS) i wczesną śródmiąższową chorobą płuc (ILD), u którego po leczeniu tofacytynibem rozwinęła się leukopenia i trombocytopenia. Pacjent zgłaszał objawy aktywnego zapalenia stawów, w tym ból wielostawowy, obustronne obrzęki kończyn i owrzodzenia jamy ustnej. Badania laboratoryjne wykazały leukopenię (liczba białych krwinek: 2,5 x 10^3/µl) i trombocytopenię (liczba płytek krwi: 85 x 10^3/µl), które ustąpiły po odstawieniu tofacytynibu. Badania obrazowe, w tym USG rąk i nadgarstków oraz tomografia komputerowa o wysokiej rozdzielczości (TKWR) klatki piersiowej, potwierdziły pogrubienie błony maziowej, nadżerki stawów i łagodne zmiany śródmiąższowe płuc. Związek czasowy między rozpoczęciem leczenia tofacytynibem a wystąpieniem nieprawidłowości hematologicznych, a także wykluczenie innych przyczyn, sugeruje prawdopodobną reakcję niepożądaną wywołaną przez lek. Wczesne wykrycie i leczenie tych działań niepożądanych ma kluczowe znaczenie dla zapobiegania powikłaniom i zapewnienia bezpieczeństwa pacjenta.klinicznej, w tym dla odpowiedniego monitorowania sezonów pyłkowych oraz planowania leczenia.

Słowa kluczowe: tofacitinib, leukopenia, ,ałopłytkowość, reumatoidalne zapalenie stawów, niepożądana reakcja na lek, kinaza janus

Summary

This case report describes a 67-year-old male with seronegative RA and early interstitial lung disease (ILD) who developed leukopenia and thrombocytopenia following tofacitinib therapy. The patient presented with symptoms of active joint inflammation, including polyarthralgia, bilateral limb swelling, and mouth ulcers. Laboratory investigations revealed leukopenia (white blood cell count: 2.5 x 10^3/µL) and thrombocytopenia (platelet count: 85 x 10^3/µL), which resolved after discontinuation of tofacitinib. Imaging studies, including ultrasound of the hands and wrists and high-resolution computed tomography (HRCT) of the thorax, confirmed synovial thickening, joint erosions, and mild interstitial lung changes. The temporal relationship between tofacitinib initiation and the onset of hematological abnormalities, along with the exclusion of other causes, suggests a probable drug-induced adverse reaction. Early detection and management of these adverse effects are essential to prevent complications and ensure patient safety.

Key words: tofacitinib, leukopenia, thrombocytopenia, rheumatoid arthritis, adverse drug reaction, janus kinase

© Alergia Astma Immunologia 2026, 31(2&3): 100-104

www.alergia-astma-immunologia.pl
Przesłano: 24.01.2026
Recenzja: 07.05.2026
Zaakceptowano: 11.05.2026

Licencje Creative Commons: To jest artykuł w otwartym dostępie, rozpowszechniany na warunkach Creative Commons Uznanie autorstwa-Użycie niekomercyjne-Na tych samych warunkach 4.0 Międzynarodowe (CC BY -NC -SA 4.0). Licencja (http://creativecommons.org/licenses/by-nc-sa/4.0/)

Adres do korespondencji/Address for correspondence
Dr. Yogesh Joshi,

Professor, Department of Pharmacy Practice,

School of Pharmaceutical Sciences,

Shri Guru Ram Rai University,

Dehradun - 248001, Uttarakhand, INDIA.

E-mail: yogeshjoshi1583@rediffmail.com

ORCID: 0000-0002-9105-923X

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic autoimmune disorder characterized by joint inflammation and systemic complications. Tofacitinib, a JAK inhibitor, has emerged as an effective treatment for RA, particularly in patients refractory to conventional disease-modifying antirheumatic drugs (DMARDs). The JAK pathway plays a very important role in immune responses, influencing the activity of various cytokines and growth factors involved in RA etiopathogenesis. Currently, five different JAK inhibitors have been approved for RA treatment and based on JAK selectivity, tofacitinib inhibits JAK1, JAK2, and JAK3 only. However, its use is associated with various adverse effects, including infections, gastrointestinal perforations, and hematological abnormalities such as leukopenia and thrombocytopenia. This case report discusses a 67-year-old male with seronegative RA and early ILD who developed leukopenia and thrombocytopenia following tofacitinib therapy. The report aims to highlight the importance of monitoring hematological parameters in patients on tofacitinib and to discuss the potential mechanisms underlying these adverse effects, supported by high-quality references and laboratory data[1-7].

CASE PRESENTATION

A 67-year-old male with a history of seronegative RA and early ILD presented with active joint inflammation, polyarthralgia, and limb swelling (right > left). The patient had stable vital signs, with systemic examination revealing mild edema. He was previously started on tofacitinib 5 mg OD. Ten days into therapy, lab results revealed leukopenia (WBC: 2.5 x 10^3/µL) and thrombocytopenia (Platelets: 85 x 10^3/µL), suggesting a drug-induced adverse effect. Tofacitinib was promptly discontinued, resulting in normalization of hematological parameters within 7 days. There were no concurrent infections or other drugs known to cause cytopenia.

TIMELINE

Day 0: Initiation of tofacitinib

Day 10: Onset of leukopenia and thrombocytopenia

Day 12: Discontinuation of tofacitinib

Day 19: Blood counts normalized

LABORATORY INVESTIGATIONS

a. Complete Blood Count (CBC):

White blood cell count (WBC): 2.5 x 10^3/µL (leukopenia)

Platelet count: 85 x 10^3/µL (thrombocytopenia at onset, normalized after discontinuation of tofacitinib)

b. Immunoglobulin Levels:

IgA: 284 mg/dL (normal range: 70–400 mg/dL)

IgG: 1290 mg/dL (normal range: 700–1600 mg/dL)

IgM: 145 mg/dL (normal range: 40–230 mg/dL)

c. Autoantibodies:

ANA: Negative

Rheumatoid factor: Negative

d. Imaging Analysis

Ultrasound of Hands and Wrists: Mild to moderate synovial thickening with internal vascularity involving dorsal and ventral recesses of wrist joints and carpo-metacarpal joints. Multiple erosions involving the dorsal surfaces of carpal bones (right > left). Moderate to severe subcutaneous edema with hyperemia in the right wrist and hand region.

HRCT Thorax: Mild reticulointerstitial thickening in peripheral/subpleural interstitium, maximally in bilateral lower lobes, with associated minimal microcystic changes. Multiple well-defined rounded to oval hypodense areas in both lobes of the liver, suggestive of old healed lesions.

DRUG THERAPY

Initial therapy included methotrexate, hydroxychloroquine, sulfasalazine, corticosteroids, and tofacitinib. Following hematologic abnormalities, tofacitinib was stopped, and supportive care was initiated (Table 1 and Table 2).

Table 1: Drug Therapy with Administration Dates

S. No.	Date (Relative)	Route	Brand Name	Generic Name	Dose	Frequency	Clinical Purpose / Notes
1	Day -1	IV Injection	INJ. PANTOP	Pantoprazole	40 mg	OD	Gastric protection
2	Day 0–10	IV Injection	INJ. H CORT	Hydrocortisone sodium succinate	100 mg	BD	Inflammation control
3	Day 0	Oral Tablet	TAB. TFCTNIB	**Tofacitinib**	5 mg	OD	Initiated for RA; **suspected cause of ADR**
4	Day -5 onwards	Oral Tablet	TAB. SAAZ DS	Sulfasalazine	1000 mg	BD	Ongoing DMARD therapy
5	Day -5 onwards	Oral Tablet	TAB. FOLITRAX	Methotrexate	15 mg	Weekly (Morning)	Core RA treatment
6	Day -5 onwards	Oral Tablet	TAB HCQ	Hydroxychloroquine	200 mg	Night OD	Long-term DMARD
7	Day 0 onwards	Oral Tablet	TAB PREGABANT	Pregabalin + Nortriptyline	75 mg + 10 mg	OD	Neuropathic pain
8	Day 0 onwards	Oral Tablet	TAB ULTRACET	Tramadol + Paracetamol	37.5 mg + 325 mg	BD	Pain relief
9	Day 0 onwards	Oral Tablet	TAB SOMPRAZD	Esomeprazole + Domperidone	40 mg + 30 mg	OD	Acid reflux / GI support
10	Day 0 onwards	Oral Tablet	TAB. FOLVITE	Methylcobalamin + Pyridoxine + Folic Acid	5 mg	OD	Hematinic and neuro-support
11	Day 0 onwards	Oral Tablet	TAB. CALCIMAX-P	Calcium + Trace elements	1 tab	BD	Bone and mineral support
12	Day 0 onwards	Oral Tablet	TAB. LEVOGEN	Ferrous fumarate + Folic acid	1 tab	OD	Anemia correction
13	Day 0 onwards	Oral Tablet	Tab. Pruvict	Prucalopride	1 mg	OD at Night	GI motility support
14	Day 0 onwards	Topical Ointment	OINT. KENAKORT	Triamcinolone Acetonide (0.1%)	Local	TDS	Topical corticosteroid
15	Day 0 onwards	Topical Gel	ORASORE GEL	Choline salicylate + Lignocaine hydrochloride	Local	TDS	Mouth ulcer relief
16	Day 10 (STAT)	Injection	INJ. H CORT	Hydrocortisone sodium succinate	1 amp	STAT	Emergency anti-inflammatory
17	Day 10 (STAT)	Injection	INJ. AVIL	Pheniramine	1 amp	STAT	Emergency antihistamine
18	Day 10 (STAT)	Injection	INJ. PIDIMOL	Paracetamol	1 amp	STAT	Analgesic/Antipyretic
19	Day 11	Injection	INJ. RITUXIMAB	Rituximab	1 g	STAT	Shift to biologic therapy after Tofacitinib stop
20	Day 0–12	IV Fluid	Normal Saline	NaCl 0.9%	100 mL	As needed	Supportive hydration

Table 2: Medications Discharge Summary

S.No.	Brand Name	Generic Name	Dose	Frequency
1.	TAB SAAZ DS	Sulfasalazine	1000MG	BD
2.	TAB PREGABA-NT	Pregabalin + Nortriptyline	75mg +10mg	OD
3.	TAB SOMPRAZ-D	Esomeprazole + Domperidone	40mg + 30mg	OD
4.	TAB. NUCOXIA MR	Etoricoxib + Thiocolchicoside	60mg + 4 mg	BD
5.	TAB ULTRACET	Tramadol + Paracetamol	37.5mg + 325mg	BD
6.	TAB. WYSOLONE	Prednisolone	60 mg	OD
7.	TAB HCQ 200MG	Hydroxychloroquinolone	200MG	HS on Sunday
8.	TAB FOLITRAX	Methotrexate	7.5mg	Once a week
9.	TAB FOLVITE	Methylcobalamin + Vitamin B6 (Pyridoxine)) + Folic Acid	1500mcg+ 1.5mg + 5mg	Once a week
10.	TAB CALCIMAX-P	Calcium + Trace elements	500 mg	BD
11.	TAB. LIVOGEN	Ferrous Ascorbate + Folic Acid	152mg + 1500mcg	OD
12.	GEL ORASORE	Choline salicylate + Lignocaine hydrochloride	GEL	AC
13.	OINT. KENOKORT	Triamcinolone Acetonide	Triamcinolone Acetonide (0.1% w/w)	TDS

DISCUSSION

Tofacitinib-induced leukopenia and thrombocytopenia are rare but significant adverse effects that require careful monitoring. The JAK-STAT pathway plays a crucial role in hematopoiesis, and its inhibition by tofacitinib may lead to impaired production of white blood cells and platelets. In this case, the patient developed leukopenia (WBC: 2.5 x 10^3/μL) and thrombocytopenia (platelet count: 85 x 10^3/μL) after initiating tofacitinib, with no other identifiable causes. The temporal relationship between drug initiation and the onset of hematological abnormalities suggests a probable association.

Previous studies have reported similar cases, emphasizing the need for regular blood count monitoring in patients on tofacitinib. Additionally, patients with comorbid conditions such as ILD may be at higher risk for adverse effects due to underlying systemic inflammation and potential drug interactions. This case underscores the importance of individualized treatment plans and close monitoring in patients with RA receiving tofacitinib. Further studies are necessary to completely characterize the mechanisms behind adverse effects, including hematologic alterations and their therapeutic consequences across different JAK inhibitors[1-4].

ADR SCALE ASSESSMENT

The causality of tofacitinib-induced leukopenia and thrombocytopenia was evaluated using the Naranjo Adverse Drug Reaction Probability Scale. The total score based on criteria such as temporal association, response to dechallenge, and alternative explanations categorized the reaction as "probable". This reinforces the need for heightened clinical awareness of this adverse effect and its timely management.

CLINICAL PHARMACIST INTERVENTIONS

1. Regular blood count assessments to detect hematological abnormalities early.
2. Educating healthcare providers and patients about potential adverse effects and warning signs.
3. Recommending dose modifications or alternative therapies based on patient response and laboratory results.
4. Encouraging documentation of adverse drug reactions for pharmacovigilance purposes.
5. Coordinating with physicians and rheumatologists for comprehensive patient care.

CONCLUSION

Tofacitinib is an effective treatment for RA but is associated with hematological adverse effects such as leukopenia and thrombocytopenia. This case report highlights the importance of regular monitoring of hematological parameters in patients on tofacitinib, particularly those with comorbid conditions like ILD. Early detection and management of these adverse effects are crucial to prevent complications and ensure patient safety. Clinicians should be aware of the potential risks and consider alternative therapies in patients who develop significant hematological abnormalities.

FUNDING SOURCES: None Declared

CONFLICT OF INTEREST: None Declared

DATA AVAILABILITY: Data are available from the authors on request.

AI DETAILED STATEMENTS: Not applicable

ETHICAL CONSIDERATIONS & DISCLOSURE:

Written informed consent was obtained from the patient for publication of this case report.

AUTHOR CONTRIBUTIONS: MK, PP: writing- original draft, editing. PP, DK: writing- data analysis advice, review, and formal analysis. MK, YJ and SG: writing- review and editing. SG, YJ: writing- review, editing, and supervision.

ACKNOWLEDGMENTS:

Patient data availability was fulfilled in support by Department of Clinical Immunology and Rheumatology, Shri Guru Ram Rai Institute of Medical & Health Sciences and Shri Mahant Indiresh Hospital, Dehradun, Uttarakhand, India.

REFERENCES

1. Ahn SM, Oh JS, Kim Y, Lee C, Yoo B, Hong S. Comparative analysis of hematological changes in patients with rheumatoid arthritis treated with different Janus kinase inhibitors: a real-world study. J Rheum Dis 2026; 33: 107-115. https://doi.org/10.4078/jrd.2025.0081
2. Ghang B, Park JK, Ju JH, Han S. Current state and future directions of basic research in rheumatoid arthritis. J Rheum Dis 2025; 32: 166-81. https://doi.org/10.4078/jrd.2024.0151
3. Khosrow-Khavar F, Desai RJ, Lee H, Lee SB, Kim SC. Tofacitinib and Risk of Malignancy: Results from the Safety of Tofacitinib in Routine Care Patients with Rheumatoid Arthritis (STAR-RA) Study. Arthritis Rheumatol 2022; 74(10): 1648-1659. https://doi.org/10.1002/art.42250
4. Álvaro-Gracia JM, García-Llorente JF, Valderrama M, Gomez S, Montoro M. Update on the Safety Profile of Tofacitinib in Rheumatoid Arthritis from Clinical Trials to Real-World Studies: A Narrative Review. Rheumatol Ther 2021; 8(1): 17-40. https://doi.org/10.1007/s40744-020-00258-9
5. Smolen JS, Landewé RBM, Bergstra SA, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2022 update. Ann Rheum Dis 2023; 82(1): 3-18. https://doi.org/10.1136/ard-2022-223356
6. Ekin A, Misirci S, İldemir S, et al. Efficacy and safety of tofacitinib in rheumatoid arthritis: Nine years of real-world data. Clin Transl Sci 2024; 17(11): e70084. https://doi.org/10.1111/cts.70084
7. Zhu C, Zheng Y, Wang Z, Chen G, Li Y. Comparative effectiveness and safety of tofacitinib vs. adalimumab in patients with rheumatoid arthritis: A systematic review and meta-analysis. Front. Pharmacol 2025; 16: 1524214. https://doi.org/10.3389/fphar.2025.1524214