



COVID-19 presenting as neutropenic fever

Hunter C. Spencer¹  · Riana Wurzburger¹

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Dear Editor,

We describe successful recovery from mild COVID-19 in a patient with pancytopenia presenting with neutropenic fever. While lymphopenia has been reported as a common finding in COVID-19, particularly in severe cases, neutropenia has been rarely reported. A case series of over 1000 patients in China observed 83% of patients had lymphopenia but did not report neutropenia, defined as absolute neutrophil count less than 1500 per cubic mm [1]. A 51-year-old man with NK-cell large granular lymphocytic leukemia complicated by pancytopenia presented with acute fever and cough and was subsequently found to be neutropenic. The patient had stable pancytopenia on a chronic regimen of cyclosporine with no recent bleeding, transfusions, or neutropenia. His exam was notable for a peak temperature of 39.4 °C, bilateral crackles but normal oxygen saturation while breathing room air. Chest x-ray showed bilateral interstitial infiltrate. His labs at presentation were notable for pancytopenia, with mild trilineage decrease compared with baseline (Table 1). His initial absolute neutrophil count (ANC) was 550 per cubic mm, a lifetime nadir. COVID-19 was diagnosed by nasopharyngeal swab with RT-PCR

positive for SARS-CoV-2. Negative microbiologic tests included blood cultures, urine culture, and urine antigens for pneumococcus and legionella. He was treated with cefepime, in accordance with guideline recommendations for neutropenic fever, and azithromycin based on initial concern for atypical bacterial community-acquired pneumonia [2]. Cyclosporine was held throughout the admission and resumed after his first hematology follow-up visit. He was treated with two doses filgrastim (Table 1). Hospital course was uncomplicated and similar to mild courses described in large case series of COVID-19 [1, 3, 4]. In fact, his time to resolution of dyspnea, time to resolution of fever, and hospital duration were on the low end of the described range (Table 1). Filgrastim was used with the expected neutrophil response and without apparent adverse events, although caution should be employed as endogenous granulocyte stimulating factor has been associated with COVID-19-related cytokine storm [5]. As COVID-19 spreads among neutropenic patients, further observations regarding the clinical course and response to emerging therapies are necessary to understand the host-virus interaction in this high-risk group.

✉ Hunter C. Spencer
spencerh@ohsu.edu

¹ Department of Medicine, Oregon Health & Science University,
7310, 3245 SW Pavilion Loop, Portland, OR 97239, USA

Table 1 Trend in fever and complete blood count parameters. “+” indicates the day that COVID-19 RT-PCR became positive. “**” indicates day a dose of filgrastim was administered. “Baseline” reflects labs acquired at the most recent outpatient visit, 3 weeks prior to presentation. “Follow up” denotes labs acquired 2 weeks post-discharge

	Baseline	Day of admission	Hospital day 1**	Hospital day 2	Hospital day 3	Hospital day 4	Hospital day 5 *	Hospital day#6	Day of discharge	Follow up
Tmax (°C)	--	38.0	38.7	38.6	39.4	38.8	39.2	37.4	37.1	--
White cell count (per mm ³)	3440	1900	2010	4570	5140	4330	2450	5000	--	2680
Absolute neutrophil count (per mm ³)	1240	550	610	3250	3760	2900	1240	3010	--	560
Total lymphocytes (per mm ³)	1780	580	1140	890	1110	1120	930	990	--	1700
Hemoglobin (g/deciliter)	10.9	10.5	9.4	10.5	10.5	10.6	10.3	9.8	--	8.6
Platelets (per mm ³)	83,000	56,000	44,000	48,000	42,000	43,000	44,000	38,000	--	22,000

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from the individual participant included in the study.

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