

# Trombocitosis extrema durante una pielonefritis aguda. Consecuencia colateral de la pandemia por Coronavirus (COVID-19)

*Extreme thrombocytosis during acute pyelonephritis. Collateral consequence of the Coronavirus (COVID-19) pandemic*

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## ABSTRACT

A young woman with extreme ( $>1,000 \times 10^9/L$ ) thrombocytosis during *Escherichia coli* pyelonephritis is presented. Diagnosis of pyelonephritis was delayed after several teleconsultations for atypical symptoms during the COVID-19 pandemic. Virtual clinic models can lead to protracted courses and bizarre manifestations of infectious disease.

**Keywords:** Thrombocytosis, pyelonephritis, Coronavirus, COVID-19

## INTRODUCTION

Thrombocytosis, defined as a platelet count greater than or equal to  $400 \times 10^9/L$ , is commonly seen in routine blood cell counts<sup>1,2</sup>. Extreme thrombocytosis, defined as a platelet count greater than or equal to one million per cubic millimetre ( $1,000 \times 10^9/L$ ), is rarely seen in general practice<sup>1,2</sup>. Extreme thrombocytosis may be primary in myeloproliferative disorders or secondary to splenectomy, haemorrhage, iron deficiency, or inflammatory diseases, including infectious diseases, because platelets function as acute-phase reactants<sup>1,2</sup>. The ongoing Coronavirus pandemic (COVID-19) has changed clinical attitudes and has fostered non-presential care (telemedicine). Virtual clinic models have advantages and drawbacks. The latter include obvious limitations for physical examination and additional restraints because of lack of face-to-face interaction<sup>3</sup>. We present a case of extreme thrombocytosis during *Escherichia coli* pyelonephritis whose diagnosis was delayed in spite of teleconsultations during the COVID-19 pandemic.

## CASE REPORT

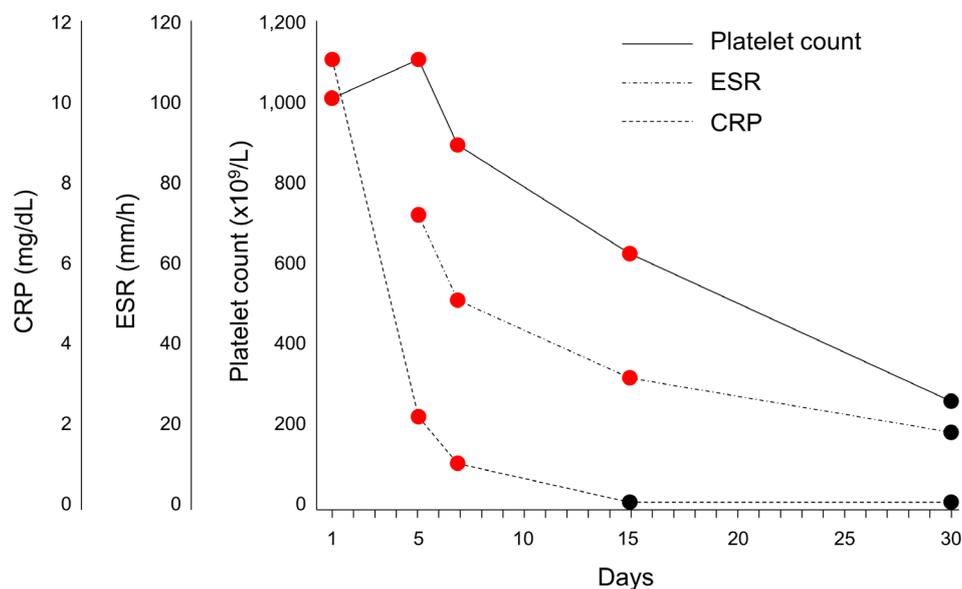
A 33-year-old woman was referred to the Emergency Department from primary care for analytical alterations on April 2020. During the preceding 16 days, she had consulted three times because of bilateral back pain. Non-presential (telephone) care had been given due to the ongoing COVID-19 pandemic. She denied fever, rigors, and urinary symptoms. She had been treated with analgesics (dextropropofen, acetaminophen, and tramadol) without relief. Lack of improvement led to a request for analytical studies whose results prompted hospital consultation. She had three previous episodes of urinary tract infection in the past; her clinical history was otherwise unremarkable. On admission, axillary temperature was  $37.1^\circ C$ , blood pressure was 130/85 mmHg, heart rate 120 bpm, and there was obvious tenderness on both the right costovertebral angle and flank. Complete blood counts revealed a white blood cell count of  $13.06 \times 10^9/L$  (dif-

ferential count, 83% neutrophils); blood haemoglobin was 12.5 g/dL, and platelet count was  $1,012 \times 10^9/L$ . Routine serum biochemistry revealed increased AST (47 IU/L), ALT (71 IU/L), GGT (355 IU/L), and alkaline phosphatase (260 IU/L) (upper normal reference values, 37, 59, 55, and 116 IU/L, respectively) with normal bilirubin concentration. Serum C-reactive protein was 11.2 mg/dL. Urinalysis revealed 709 leukocytes/ $\mu L$  and 1066 red blood cells/ $\mu L$  with a positive result in the nitrite test. Abdominal ultrasound revealed no abnormalities. The patient was admitted to the hospital under ceftriaxone (2 g/day) and low-dose (100 mg/day) acetylsalicylic acid therapy. Urine culture yielded a multisensitive strain of *Escherichia coli*. The patient condition progressively improved. Platelet count reached  $1,137 \times 10^9/L$  and steadily decreased thereafter, along with markers of inflammation (Figure 1). Ceftriaxone was switched to cefuroxime and the patient was discharged after 7 days of hospital admission. Vaginal candidiasis, which was treated with clotrimazole, was the only significant complication. Platelet count normalized during follow-up (Figure 1) and acetylsalicylic acid was withdrawn. Normal levels of serum ferritin and transferrin saturation ruled out iron deficiency. Serum transaminases also normalized progressively (data not shown). One month later, the patient was asymptomatic and urine culture was negative.

## DISCUSSION

Extreme thrombocytosis is exceptional during acute pyelonephritis. In our experience in a series of 421 patients with pyelonephritis who were admitted to the hospital<sup>4</sup>, median platelet count on admission was  $211 \times 10^9/L$ ; in that series, just 14 cases (3.3%) showed a platelet count greater than  $400 \times 10^9/L$ , and only one case showed a platelet count greater than  $500 \times 10^9/L$  (highest observed value,  $607 \times 10^9/L$ ) (unpublished observation). In another series of 52 patients with severe pyelonephritis (acute focal bacterial nephritis)<sup>5</sup>, only one patient (1.7%) showed a platelet count on admission

Figure 1. Time-course changes of blood platelet count and inflammation markers after antimicrobial therapy. Intravenous ceftriaxone (2 g every 24 hours) was initiated on day 1. It was switched to cefuroxime on day 5 and maintained for a total of 14 days. Red dots represent abnormal values. Black dots represent normal values. CRP, C-reactive protein; ESR, erythrocyte sedimentation rate.



greater than  $400 \times 10^9/L$  (highest observed value,  $407 \times 10^9/L$ ) (unpublished observation). In contrast, transaminase elevation (also present in this case), is common during acute pyelonephritis<sup>4</sup>. The favourable outcome after therapy confirms that the protracted infectious/inflammatory disorder was the cause of analytical aberrations in the presented case.

The COVID-19 pandemic is ever changing medical attention, including Primary Care<sup>3</sup>. In the first weeks after the state of alarm due to the COVID-19 pandemic (the period in which the presented patient developed her disease), the attendance to the Emergency Department decreased by two thirds, and hospital admissions in medical areas decreased by a third in a general hospital from our region<sup>6</sup>. Virtual care and telemedicine are useful tools in this changing scenario, but may lead to missed treatment for acute problems, to inadequate prevention, or to uncontrolled chronic disease<sup>3</sup>. The presented case illustrates how delayed diagnosis may favour protracted courses and atypical manifestations of infectious disease.

#### CONFLICTS OF INTEREST AND SOURCE OF FUNDING

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