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# Wegner's granulomatosis presented as fever and anuria

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## 1. Case presentation

A 62 years old Palestinian woman with a history of diabetes mellitus presented to our department with a decrease in urine output since a week before, and complete anuria with the onset of bilateral flank pain more prominent in the right side in the last 3 days. The pain was dull in nature, continuous, severe, and changing with the position. Other symptoms included epistaxis, anorexia, nausea, and eye redness appearing 10 days before the admission, which resolved in 2 days on home remedies (herbal compressor).

Laboratory test revealed increased c-reactive protein (CRP), high creatinine, anemia, elevated perinuclear anti-neutrophil cytoplasmic antibodies (pANCA) (>100) and normal C3, C4, cytoplasmic anti-neutrophil cytoplasmic antibodies (cANCA), and anti-glomerular basement membrane (Anti GBM) antibody. The patient also had proteinuria. Blood film ruled out hemolysis. Septic workup was done, including blood and urine culture, which showed extended spectrum beta-lactamase (ESBL). High resolution chest computed tomography (CT) scan showed atelectasis bands and bilateral pleural effusion. Renal ultrasound findings ruled out hydronephrosis or signs of chronic kidney disease. She was started on pulse steroid therapy. The treatment protocol included hemodialysis, plasmapheresis, and antibiotics. The patient developed hypertension, for which antihypertensive medications were administrated. Renal biopsy was taken and it showed sclerosed glomeruli with acute tubular necrosis and localized vessel necrosis, confirming the diagnosis of ANCA glomerulonephritis and vasculitis. The protocol of cyclophosphamide therapy was planned.

After taking one cycle of cyclophosphamide and during the fourth session of plasmapheresis, the patient became unresponsive, clenched teeth, and spastic. She was immediately transferred to ICU. Urgent intubation was done without complications.

Electroencephalogram (EEG) findings were abnormal and brain magnetic resonance imaging (MRI) showed bilateral multiple areas of high signal in T2 and flair in the supratentorial white matter mainly in the subcortical region. Furthermore, there was no diffusion restriction (no acute infarction), intra-cranial hemorrhage, mass effect, or hydrocephalus. Chest CT revealed the presence of multifocal, bilateral, patchy infiltrations. The patient had vesicles on lips and buccal mucosa. We suspected herpes encephalitis and started her on acyclovir. Lab tests showed disseminated intravascular coagulation and bacteremia with EBSL, sensitive to vancomycin. We started her on antibiotics and anticoagulant. Her status improved, she regained consciousness, and she was transferred out of ICU after 12 sessions of hemodialysis. The patient was discharged and put on prednitab, Cyclophosphamide 500 mg / month with a total of 6 doses and antihypertensive medication. The level of creatinine on last follow up was normal and there were no further complications.

## 2. Learning points

The most common symptoms at the time of presentation of Wegener's granulomatosis (WG) are nose, ear, and throat symptoms (70-100%), pulmonary manifestations (50-90%), and kidney involvement (40-100%) (1). However, the occurrence of acute renal failure as a first presentation remains uncommon. Diagnosing WG may be difficult in some cases and it is often misdiagnosed as tuberculosis, lung neoplasms, and other conditions leading to a delay in the management. Currently, the prognosis of untreated patients with WG is considered to be poor and about 90% of untreated patients die within 2 years (2). Reports show that the 5-year relapse rate for WG is high (3). Infections are considered as a frequent cause of death among WG patients (4). In this article, we described a new case of WG who developed encephalitis and sepsis after receiving cyclophosphamide as an immunosuppressive and plasmapheresis. In this article, we reported a case of WG presenting with acute renal failure treated with hemodialysis and plasmapheresis, who got herpes encephalitis and disseminated intravascular coagu-

lation related to bacterial sepsis after receiving one dose of cyclophosphamide. WG is a rare disorder involving mainly small and medium-sized vessels. The term Wegener refers to Dr. Friedrich Wegener, a German pathologist who first described the disease in 1936 (5). It is considered an autoimmune disease, but its pathogenesis is unclear. Its average age of onset is about 40 years, with a male to female ratio of 1:1. It usually presents with prodromal and various symptoms involving many organs (6). In a Chinese cohort, the incidence of WG with acute renal failure was 15%, with an average age of 50 years old. The common symptoms were fever and weight loss, while the most common extra-renal organ damages involved lung and nose. Renal damages manifested as mild or moderate proteinuria and hematuria. However, oliguria and anuria are rare (7). Our patient presented with epistaxis, eye involvement, anuria, and urinary infection.

Bajema et al. performed a meta-analysis on 349 cases and showed that WG with renal involvement was, clinically, in a more progressive state than WG without renal involvement (8). In addition, it is generally accepted that patients with WG who are of older age, with renal involvement or infection, have worse outcomes and higher mortality rates compared with other patients who develop WG (9).

The diagnosis of this disease is made by the detection of necrotizing granulomatous vasculitis on tissue biopsy, in addition to the clinical presentation. The treatment of WG is currently done in two phases: induction and maintenance phases. Severe disease, including biopsy proven renal disease, requires a treatment including pulse steroids and cyclophosphamide or rutiximab to induce remission. Some patients may need plasmapheresis, especially patients presenting with severe renal disease with a level of creatinine above 5.7 and those with pulmonary hemorrhage and those not responding to steroids and cyclophosphamide (10-12).

Severe infection is a recognized problem in ANCA-associated vasculitis, with some important prognostic factors, such as having increased disease activity at the time of diagnosis and age. These complications are associated with permanent organ damage and increased odds of mortality (13). Although complications may appear during treatment, a rationally designed combination treatment of steroid hormones and immunosuppressive drugs may improve the prognosis of WG (14). Our patient developed her symptoms after being treated with antibiotics, which made us think about a viral infection. Further lab tests showed disseminated intravascular coagulation and bacteremia with EBSL. Most importantly, all concomitant infections need to be treated prior to immunosuppression. In such cases, plasma-exchange therapy may be the initial modality of choice to restore kidney function, given its rapid action to reduce antibody load and its moderate immunosuppressive action (15).

This case of WG illustrates the narrow path between therapeutic control of the disease and opportunistic infections due to medical immunosuppression. The overall goal is disease remission without infectious complications or side effects. To reach this goal, various variables including age, and renal and liver function need to be considered on an individual basis.

## 3. Declarations

### 3.1. Acknowledgement

None.

### 3.2. Authors' contribution

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors

### 3.3. Conflict of interest

Authors declare no conflicts of interest.

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### 3.5. Consent for publication

The authors declare that they have obtained the patient's consent.

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