Acta Scientific Neurology (ASNE)

Volume 9 Issue 3 March 2026

Case Report

Multisystemic Complications in Elderly and Diabetic Patients: A Case Series Exploring the Interplay of Sepsis, Chronic Comorbidities, and Infectious Burden

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Received: February 16, 2026

Published: February 28, 2026

Abstract

These case series represent a broad spectrum of patients admitted with sepsis and its associated complications, arising from diverse sources of infection and occurring in the presence of multiple underlying medical conditions. Patients commonly presented with fever, altered sensorium, breathing difficulty, reduced urine output, abdominal pain, cough, and burning micturition, all suggesting severe infection at the time of admission. The most frequent causes of sepsis were urosepsis, pneumonia, diabetic foot infections, tuberculosis-related infections, viral fever, and gastrointestinal infections. A significant number of patients progressed to septic shock, which required urgent monitoring and aggressive treatment to support blood pressure, respiration, and vital organ function. Several forms of organ dysfunction were observed, including acute kidney injury, chronic kidney disease, acute respiratory distress syndrome, metabolic encephalopathy, meningoencephalitis, anaemia, and heart failure. Many patients also had pre-existing illnesses such as type II diabetes mellitus, hypertension, ischemic heart disease, hypothyroidism, bronchial asthma, chronic anaemia, and a previous history of pulmonary tuberculosis. These comorbidities increased the severity of sepsis and complicated management. Treatment primarily focused on early control of infection using appropriate antibiotics. In selected cases, antiviral drugs, antitubercular therapy under the National Tuberculosis Elimination Programme, and steroids were administered. Supportive management included intravenous fluids to maintain circulation, noradrenaline for patients in shock, insulin therapy for blood sugar control, and respiratory support with oxygen, nebulization, and bronchodilators. Kidney-protective measures, careful fluid balance, and symptomatic treatments such as antipyretics, vitamins, and nutritional support were also provided. Overall, these cases emphasise the complex nature of sepsis and highlight the importance of early diagnosis, prompt antimicrobial therapy, and comprehensive supportive care to improve patient outcomes and reduce mortality.

Keywords: Sepsis; Abdominal Pain; Lungs; Kidney

Introduction

Sepsis is a serious and life-threatening medical condition that occurs when the body shows an abnormal and harmful response to an infection. Instead of controlling the infection, the immune system becomes overactive and damages the body's own tissues and organs. Over the years, the definition of sepsis has evolved, and it is now clearly understood as infection-related organ dysfunction caused by a disturbed immune response. If not recognised and treated early, sepsis can quickly progress to septic shock, which carries a high risk of death. Sepsis can affect many organs, including the lungs, kidneys, brain, heart, and liver [1,2].

Early identification of sepsis is very important for reducing complications and improving survival. In clinical practice, screening tools such as the Systemic Inflammatory Response Syndrome (SIRS) criteria and the quick Sequential Organ Failure Assessment (qSOFA) score are commonly used to detect patients at risk. These tools help in early suspicion, but they are not always accurate. Therefore, doctors must also rely on clinical judgment, patient history, and laboratory findings. Blood tests, such as inflammatory markers, lactate levels, and organ function tests, help in confirming the diagnosis and assessing severity [3].

Management of sepsis focuses on early diagnosis and prompt initiation of appropriate antibiotics to control the infection. Rapid and careful fluid resuscitation is given to maintain blood pressure and organ perfusion. If low blood pressure persists even after adequate fluids, vasopressor drugs are used, with norepinephrine commonly preferred as the first choice. Supportive care, including oxygen therapy, blood sugar control, kidney support, and correction of electrolyte imbalances, plays a key role in patient recovery [4].

Elderly and diabetic patients are at high risk for sepsis because their immune system is weak and less able to fight infection. Older adults may not show clear signs like high fever, which can delay diagnosis. In diabetes, high blood sugar reduces the body's ability to control infection and slows healing. Other diseases such as heart or kidney problems make diagnosis and treatment more difficult. Sepsis in these patients often affects multiple organs, increasing the risk of organ failure and death.

The clinical features of sepsis vary greatly from patient to patient. These differences depend on the source of infection, the type of organism involved, the organs affected, the patient's underlying medical conditions, and the time taken to start treatment. Early signs of sepsis may be mild or unclear, making diagnosis difficult. Organ dysfunction most commonly affects the lungs and heart. Lung involvement may lead to acute respiratory distress syndrome, causing low oxygen levels. Heart involvement often presents as low blood pressure or raised blood lactate levels. The brain and kidneys are also frequently affected, leading to confusion, reduced urine output, and rising creatinine levels. Other problems include liver dysfunction, low platelet count, bleeding disorders, blood sugar imbalance, and muscle weakness [5].

Sepsis in older adults presents additional challenges. Age-related changes and multiple chronic illnesses increase the risk of infection and severe disease. Older patients often show atypical symptoms, which can delay diagnosis. Changes in drug handling increase the risk of adverse drug reactions, making careful dosing and close monitoring essential. Understanding these factors improves early detection and management of sepsis and helps reduce mortality [6].

Case Presentation

There are the twelve cases together represent a broad spectrum of patients admitted with sepsis and its complications, presenting with different sources of infection and multiple underlying illnesses. Several patients came with fever, altered sensorium, breathing difficulty, reduced urine output, abdominal pain, cough, or burning micturition, indicating severe infection at presentation. The most common causes of sepsis were urosepsis, pneumonia, diabetic foot infection, tuberculosis-related infection, viral fever, and gastrointestinal infections. Many patients developed septic shock, requiring close monitoring and urgent treatment to support blood pressure, breathing, and organ function. Multiple organ dysfunctions were noted, including acute kidney injury, chronic kidney disease, acute respiratory distress syndrome, metabolic encephalopathy, meningoencephalitis, anaemia, and heart failure. Many patients had long-standing conditions such as type II diabetes mellitus, hypertension, ischemic heart disease, hypothyroidism, bronchial asthma, chronic anaemia, and a history of pulmonary tuberculosis, which increased their risk and severity of illness. Treatment for all patients mainly focused on early control of infection using appropriate antibiotics, and in specific cases, antivirals, antitubercular drugs under NTEP, and steroids were added. Intravenous fluids were given to maintain circulation,

while noradrenaline was used in patients with shock to support blood pressure. Insulin therapy was used widely to maintain blood sugar control in diabetic patients. Respiratory support in the form of oxygen, nebulization, and bronchodilators helped patients with pneumonia, bronchitis, asthma, or respiratory failure. Kidney-protective medicines and careful fluid management were used in patients with acute or chronic kidney disease. Supportive care included paracetamol for fever, pain-relieving drugs, stomach-protective medicines, probiotics, vitamins, iron supplements, and calcium to aid recovery and prevent complications. Patients with heart disease and thyroid disorders received regular medications to maintain stability during acute illness. Infections related to wounds, diabetic foot, necrotising soft tissue infection, and post-amputation status required aggressive antibiotics and close observation. Overall, these cases highlight the complex nature of sepsis, especially in patients with multiple comorbidities, and emphasise the importance of early diagnosis, prompt antimicrobial therapy, organ support, and comprehensive supportive care to improve outcomes and reduce mortality in severe systemic infections. Among the twelve cases, common sources of sepsis were urinary tract infection, pneumonia, diabetic foot, and soft tissue infection. Several patients developed septic shock with organ problems such as acute kidney injury and respiratory failure. Culture reports showed positive results in blood, urine, sputum, wound, or pus samples in many cases, supporting the diagnosis. Most patients received antibiotics, IV fluids, insulin, oxygen support, and noradrenaline in shock. Treatment was individualized based on existing diseases, and many patients improved with timely management.

SL No	Patient Complaints	Diagnosis	Treatment Plan
1	C/o irrelevant talks x 1 day, c/o decreased urine output for 6 days, c/o abdominal pain x 4 days, c/o reduced appetite and nausea x 1 day.	Sepsis with septic shock with mods secondary to urosepsis and ventilator-associated pneumonia with AKI or acute respiratory distress syndrome, metabolic encephalopathy, type II diabetes mellitus.	The patient received antibiotics, insulin, and steroids with IV fluids. Noradrenaline maintained blood pressure, Asthalin improved breathing, and Nefrosave protected kidneys during treatment for severe infection and organ support.
2	C/o cough for 1 week, c/o weakness for 5 days, c/o loss of appetite for 2 days	Sepsis with B/L bronchopneumonia, RHD, old pulmonary TB	The patient was treated with antibiotics for infection, IV fluids for hydration, oxygen for breathing support, and medicines to manage heart disease and weakness caused by sepsis and bronchopneumonia.
3	C/o chest pain for 3days c/o fever for 3days c/o burning micturition x 3days c/o cough with expectoration for 3days	Urosepsis in shock, CKD -V no impaired, AOCKD sepsis secondary to pyclo uremic/ sepsis URD -V type II diabetes mellitus.	The patient received antibiotics, insulin, and stomach protection medicines. Nebulizers improved breathing, while tablets supported kidney function and controlled blood pressure during treatment for infection and respiratory problems
4	C/o fever for eight days, c/o cough with expectoration for eight days, c/o generalised weakness for eight days	Sepsis secondary to CAP, HTN, acute bronchitis, hypertension, and newly detected type II diabetes mellitus.	The patient was treated with antibiotics for infection, cough syrup and nebulization for chest relief, blood pressure and sugar control tablets, and paracetamol for fever and pain management.

5	C/o fever since this afternoon.	Sepsis secondary to diabetic foot with type II diabetes mellitus, HTN, hypothyroidism, and IHD	The patient received antibiotics and IV fluids for infection, insulin for sugar control, thyroid and heart medicines, kidney-protective tablets, and supportive drugs for fever, stomach protection, and overall recovery
6	C/o joints pain for 3 days c/o fever for 3 days	Sepsis with septic shock, viral fever with TCP, HTN, and meningoencephalitis	The patient received antibiotics and steroids for infection and inflammation, vitamins for nerve and blood support, diuretics for swelling, and medicines for pain relief, cholesterol control, and stomach protection.
7	C/o fever with chills since 1 day, c/o difficulty in breathing since evening	Sepsis with septic shock secondary to pneumonia, IHD, severe anaemia, IDA, k/c/o bronchial asthma, type 2 diabetes mellitus, and hypothyroidism.	The patient received antibiotics, insulin, and antiviral drugs for infection control. Nebulisers and syrups improved breathing, while tablets managed thyroid, diabetes, acidity, and anaemia, supporting recovery and overall health.
8	C/o wound on left foot for 30 days, c/o fever with chills for 20 days	Sepsis left a diabetic foot, and heart failure improved—diabetic kidney disease, anaemia of chronic disease with type II diabetes mellitus.	The patient received antibiotics, insulin, and iron supplements for infection and anemia. Medicines supported heart and kidney function, controlled blood pressure and sugar, and improved digestion and recovery during treatment.
9	Complaints of fever for 5 days, complaints of burning micturition for 4 days.	Urosepsis secondary to cystitis with AKI, IHD, left diabetic foot, S/P left great toe amputation, peripheral vascular disease, EROSIVE gastritis with type II diabetes mellitus, systemic HTN, and anemia.	The patient received antibiotics and insulin for infection and sugar control. Medicines helped manage blood pressure, dizziness, and pain, while syrups supported digestion and calcium supplements improved bone strength.
10	C/o fever with chills x 8 days, c/o cough with expectoration x 8 days	Sepsis with septic shock (TB adenitis), left lower lobe consolidation with collapse, Rickettsial fever (Weil-Felix positive), and old pulmonary tuberculosis.	The patient received anti-tuberculosis medicines under NTEP, along with antibiotics, steroids, and stomach protection. Cough syrup and probiotics supported recovery, while vitamins improved overall strength and reduced treatment side effects.
11	Complaints of blackish discoloration of skin over scrotum and left thigh since 1week (20-11-2024), foul foul-smelling watery discharge since 1week	Sepsis, hypralburumia, Necrosis foociyes.	The patient received multiple antibiotics and supportive medicines for severe infection. Noradrenaline maintained blood pressure, while painkillers, vitamins, and stomach-protective drugs aided recovery and improved overall health during treatment.

12	C/o fever for 7 days c/o vomiting 4 days ago c/o loose stools 4 days ago	Sepsis in shock secondary to UTI and acute GE, dengue, viral fever with thrombocytopenia, and AKI secondary to acute GE.	The patient received IV fluids, stomach protection, and blood thinner injections. Medicines supported liver and kidney function, improved nerve health, controlled blood pressure, reduced acidity, and helped maintain overall body balance.

Table 1: Patients' clinical signs with their treatment.

[Abbreviations: C/o – Complaints of; K/C/O – Know Case of or already present case; S/P – Status Post; B/L – Bilateral; AKI – Acute Kidney Injury; RHD - Rheumatic Heart Disease; TB – Tuberculosis; CKD-V – Chronic Kidney Disease stage 5; AOCKD - Acute on Chronic Kidney Disease; URD-V – Uremic Renal Disease Stage 5; CAP - Community Acquired Pneumonia; HTN – Hypertension; IHD – Ischemic Heart Disease; TCP - Thrombocytopenia; IDA - Iron Deficiency Anemia; UTI – Urinary tract Infection; GE – Gastroenteritis; NTEP - National Tuberculosis Elimination Programme].

Patient report	DATE [Admission Discharge].	BP 120/80 mmHg	PR 72 bpm	SPO2 96 – 100%	RR 18 – 20 bpm	GRBS 80 – 120 gm/dl
1	06/02/2025 24/03/2025	106/80 118/80	110 bpm 95 bpm	98% 98%	20 bpm 20 bpm	268 250
2	08/02/2025 17/02/2025	120/80 122/80	98 bpm 85 bpm	96% 98%	18 bpm 20 bpm	127 128
3	17/02/2025 28/02/2025	118/80 124/80	85 bpm 76 bpm	98% 96%	22 bpm 18 bpm	240 180
4	07/01/2025 10/01/2025	162/76 130/90	96 bpm 87 bpm	98% 98%	22 bpm 18 bpm	220 170
5	15/05/2025 23/05/2025	90/60 100/80	87 bpm 96 bpm	97% 96%	18 bpm 21 bpm	180 190
6	02/01/2025 10/01/2025	130/80 128/90	80 bpm 77 bpm	99% 97%	22 bpm 21 bpm	120 120
7	07/01/2025 11/01/2025	80/46 110/80	85 bpm 80 bpm	98% 99%	22 bpm 22 bpm	150 138
8	15/01/2025 21/01/2025	130/90 124/90	78 bpm 72 bpm	99% 98%	21 bpm 18 bpm	177 137
9	27/01/2025 13/02/2025	138/70 124/80	124 bpm 96 bpm	97% 99%	22 bpm 21 bpm	138 130
10	13/01/2025 23/01/2025	114/80 124/80	110 bpm 90 bpm	98% 97%	20 bpm 18 bpm	114 108
11	01/02/2025 01/03/2025	120/80 124/80	102 bpm 99 bpm	99% 99%	18 bpm 19 bpm	120 100
12	02/01/2025 08/01/2025	120/80 124/80	108 bpm 92 bpm	97% 98%	20 bpm 22 bpm	110 101

Table 2: Patients' vital signs.

[Abbreviations: BP – Blood Pressure; PR – Pulse Rate; SPO2 - Peripheral Capillary Oxygen Saturation; RR – Respiration Rate; GRBS – General Random Blood Sugar; mmHg - millimetres of mercury; bpm - beats per minute; gm/dl - grams per decilitre].

Patients	Date	WBC count [4000-11000 cells/µl]	PCT [less than 0.1ng/ml]	CRP [less than 1.0 mg/L]	Serum lactate [4.5-19.8 mg/dl]
1	06/02/2025	3800 cells /µl	0.12 ng/ml	0.1 mg/L	20.3 mg/dl
2	08/02/2025	3700 cells /µl	0.21 ng/ml	1.2 mg/L	25.3 mg/dl
3	17/02/2025	3500 cells /µl	0.2 ng/ml	1.32 mg/L	24.2 mg/dl
4	07/01/2025	3980 cells /µl	0.23 ng/ml	0.98 mg/L	25.3 mg/dl
5	15/05/2025	3698 cells /µl	0.14 ng/ml	1.35 mg/L	28.2 mg/dl
6	02/01/2025	3125 cells /µl	0.15 ng/ml	1.0 mg/L	30.2 mg/dl
7	07/01/2025	3652 cells /µl	0.21 ng/ml	1.5 mg/L	25 mg/dl
8	15/01/2025	3258 cells /µl	0.12 ng/ml	2.5 mg/L	24 mg/dl
9	27/01/2025	3987 cells /µl	0.21 ng/ml	3.6 mg/L	35.4 mg/dl
10	13/01/2025	4254 cells /µl	0.15 ng/ml	3.8 mg/L	22.3 mg/dl
11	01/02/2025	3940 cells /µl	0.32 ng/ml	4.5 mg/L	24.5 mg/dl
12	01/02/2025	4096 cells /µl	0.25 ng/ml	2.3 mg/L	26.3 mg/dl

Table 3: Blood test.

[Abbreviations: cells/µl - cells per microliter; ng/ml - nanograms per millilitre; mg/L - milligrams per liter].

Patients	Date	Blood culture	Urine culture	Sputum culture	Wound culture	Pus culture
1	06/02/2025	Positive	Negative	Negative	Negative	Negative
2	08/02/2025	Positive	Negative	Negative	Negative	Negative
3	17/02/2025	Negative	Negative	Positive	Positive	Negative
4	07/01/2025	Negative	Positive	Negative	Negative	Negative
5	15/05/2025	Positive	Negative	Negative	Positive	Negative
6	02/01/2025	Positive	Negative	Negative	Negative	Positive
7	07/01/2025	Negative	Positive	Negative	Positive	Negative
8	15/01/2025	Positive	Negative	Negative	Negative	Negative
9	27/01/2025	Positive	Negative	Negative	Negative	Negative
10	13/01/2025	Negative	Positive	Negative	Negative	Negative
11	01/02/2025	Negative	Positive	Positive	Negative	Negative
12	01/02/2025	Positive	Negative	Negative	Negative	Negative

Table 4: Microbiological Test.

Discussion

Sepsis is a serious and life-threatening condition in which the body reacts in an abnormal way to an infection and damages its own organs. Instead of protecting the body, the immune system causes widespread inflammation that harms tissues and vital organs. If not treated early, sepsis can quickly progress to septic shock and increase the risk of death. It can affect many organs, including the lungs, kidneys, brain, heart, and liver [7,8]. These

cases were presented with varied complaints, indicating severe infection. Common symptoms included fever, chills, cough with expectoration, breathing difficulty, altered mental status, reduced urine output, abdominal pain, vomiting, loose stools, and burning micturition. Some patients had chronic wounds such as diabetic foot ulcers or soft tissue infections with foul discharge. Several showed weaknesses, loss of appetite, joint pain, or chest pain. These complaints suggested infections from urinary, respiratory, gastrointestinal, and skin sources, with early signs of organ involvement, helping clinicians suspect sepsis and initiate timely management [9,10]. They managed with a similar treatment approach focused on early control of infection, organ support, and management of existing illnesses. Broad-spectrum antibiotics were started in all cases to treat sepsis, and in selected patients, antiviral drugs, antitubercular therapy, or steroids were added based on the cause of infection. Intravenous fluids were given to maintain blood circulation, while noradrenaline was used in patients with septic shock to support blood pressure. Insulin therapy was commonly used to control blood sugar levels in diabetic patients. Oxygen therapy, nebulization, and bronchodilators were provided to patients with breathing difficulty due to pneumonia, bronchitis, or asthma. Kidney-protective medicines and careful fluid management were used in patients with acute or chronic kidney disease. Supportive treatment included paracetamol for fever, pain-relieving drugs, stomach-protective medicines, vitamins, iron and calcium supplements, and probiotics to improve recovery. Medications for heart disease, thyroid disorders, and hypertension were continued to maintain stability during the acute illness. Overall, treatment was individualised but followed a systematic approach aimed at infection control, organ support, and prevention of complications [11,12]. In our cases, laboratory markers helped assess disease severity and response to treatment. High C reactive protein (CRP) and procalcitonin (PCT) levels indicated severe bacterial infection, and very high values were linked to more serious illness. A decrease in these markers during treatment showed clinical improvement. Elevated serum lactate levels indicated poor tissue oxygen supply and were associated with septic shock and higher risk of organ failure. Reduction in lactate suggested better circulation and recovery.

Conclusion

This case series shows that elderly and diabetic patients are more likely to develop severe multisystem complications when sepsis occurs. The presence of chronic diseases such as hypertension, kidney problems, and heart disorders increases the risk of poor outcomes. Early detection, proper antibiotic use, and supportive care are essential to control infection and prevent organ damage. The study highlights the importance of regular monitoring and managing existing health problems to reduce the chances of sepsis-related complications. Understanding how infections interact with chronic conditions can help doctors plan better treatment strategies. Overall, this study emphasises that a multidisciplinary approach and timely medical attention are key to improving survival and recovery in elderly and diabetic patients with sepsis.

Limitation of the Study

This case series has some limitations. The study included only a small number of patients, which may not represent all elderly or diabetic people with sepsis. Data were collected from a single hospital, so the results may differ in other healthcare settings. Some information, such as previous medical history and long-term outcomes, was limited or missing. Laboratory findings and treatment responses could vary depending on the patient's condition and hospital resources. Also, because this is a case series, it cannot prove cause-and-effect relationships between sepsis, chronic diseases, and infection severity. Future research with larger, multicentre studies and longer follow-up is needed to confirm these findings and better understand the connection between multiple comorbidities and sepsis.

Source of Funding

None.

Conflict of Interest

None.

Acknowledgment

The authors are thankful to the Management. The author also acknowledges the help and support provided by the Sapthagiri Institute of Medical Sciences and Research Centre Hospital, the case patient and his parents.

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