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An Atypical Presentation of Varicella Zooster Meningitis in End Stage Renal Disease: A Case Report

Rana Muhammad Hamza*, Tooba Maqsood, Kashif Rafique, Muhammad Arsalan Ali and Maarij Shehzad

Shifa International Hospital, Faisalabad, Pakistan

***Corresponding Author**: Rana Muhammad Hamza, Shifa International Hospital, Faisalabad, Pakistan, E-mail id: thehamzacity@gmail.com

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Abstract

Varicella infections cause serious morbidity and mortality in patients with end-stage renal disease, particularly with maintenance hemodialysis and transplants. The literature suggests that the administration of live attenuated varicella vaccine is extremely effective and safe in such patients. Lack of resources, consensus guidelines, and vaccine availability results in poor compliance and increased mortality from varicella infections. We report a case of 56 years old female who presented with a sudden onset of altered loss of consciousness, followed by generalized tonic-clonic fits, which was later diagnosed with varicella meningitis with no typical features of either vesicular rash or cranial nerve palsy. With the increasing burden of the renal diseases, immunocompromised patients can suffer from serious consequences of varicella infections that can be prevented by varicella vaccination.

Keywords: VZV Meningitis, Hemodialysis

Introduction

The human alpha-herpesvirus, Varicella zoster virus, causes varicella (chickenpox) during primary infection, a benign, self-limiting illness. After primary infection, the virus resides in the ganglionic neurons near the spinal cord or brainstem. It is often reactivated due to diminished VZV-specific cell-mediated immunity in immunocompromised individuals, with Acquired Immunodeficiency Syndrome (AIDS) or organ transplantation. The virus travels along nerves and causes a characteristic vesicular rash known as Shingles. However, the virus can travel to the brain and spinal cord, affecting the central nervous system, causing meningitis, encephalitis, myelitis, acute retinal necrosis, and temporal arteritis[1]. Patients with end-stage renal disease are immunocompromised, which contributes to the high incidence of Varicella zoster virus reactivation among these patients. According to the literature, patients with ESRD have a doubled risk of varicella zoster virus reactivation as compared to the general population. Hemodialysis does not improve the immune system[2].

This case report reinforces the literature on VZV meningitis-encephalitis and underscores the urgency of diagnosis and treatment, even with atypical presentations, and highlights the importance and scarcity of consensus guidelines for varicella vaccination among patients with end stage renal disease.

Case report

A 56-year-old female presented in the emergency department of the hospital in altered sensorium, followed by one episode of generalized tonic-clonic fits at home. The episode was sudden in onset, lasting approximately 2, 3 minutes, and was associated with tongue biting and urinary incontinence. No focal onset was reported or observed by the witnesses.

Post -ictally, he remained unconscious with no focal deficit when he landed in the emergency department. There was no history of fever, head trauma and substance abuse. Upon presentation, her vitals were: blood pressure 150/90, R.R. 19 bpm, Pulse rate 89 bpm, SpO2 91% on room air. Initial investigation, including a complete blood profile along with serum electrolytes and renal function tests, was ordered, which reported a White blood cell count of 12,900, hemoglobin of 13.2 mg/dl, serum potassium of 6.0 mEq/L, Serum bicarbonate of 12 mEq/L, Serum urea of 179.6 mg/dL, and creatinine of 10.65 mg/dL. The patient was a previously known case of Type II Diabetes mellitus, on insulin therapy for 14 years with good compliance and control, Hypertension secondary to end-stage renal disease, on maintenance dialysis for 2 years twice weekly. Her surgical history suggested bilateral arthroplasty done 6 months ago. After reviewing the initial bloods, the blood culture, and CSF profile, cultures were sent. Since the patient was anuric, urine culture and examination were not performed. Her CT- Scan was also unremarkable. A hemodialysis session was performed, but the patient remained unconscious. Her CSF Profile revealed a low opening pressure with WBCs 60 cells/uL, Neutrophils 15%, Lymphocytes 85%, Glucose 77 mg/dl, Protein 149 mg/dl, and LDH 25 U/L. Considering the lymphocytic pleocytosis and raised proteins in the CSF, the patient was commenced immediately on empirical treatment of meningitis comprising Acyclovir and dexamethasone. Her HSV DNA for HSV1 and HSV2 was also negative.

On the third day of admission, the patient reported high-grade fever, and her blood revealed a raised white blood cell count of 19,300. Her chest X-ray showed a consolidation in the right lower lobe, with blunting of the costophrenic angle. The patient was then started on Meropenem and Moxifloxacin for sepsis, along with acyclovir for viral meningitis, and dialysis sessions were carried out regularly since the day of admission. On the 4th day, her CSF culture reported varicella zoster virus. No typical feature, including vesicular rash or cranial nerve palsy, was noted in the patient. Since, the drug of choice for the VZV is Acyclovir, renal clearance was achieved with daily dialysis. Her conscious level has not improved to date while the patient was on single inotropic support. Her blood gases were also normal, and no acedmia noted to date. Strict monitoring and correction of electrolyte levels were performed throughout the course.

On the 6th day of her admission, her level of consciousness improved, with eye opening upon verbal command; however, no motor or verbal improvement was observed. Her WBC was also improved, with no fever spikes since 28 hours. On the 11th day of her admission, she regained her consciousness completely. Throughout her admission, her hemodialysis was continued. She was discharged home on oral acyclovir to complete a course of 14 days with advice to follow up.

Discussion

Varicella Zoster virus meningitis is a fatal and potentially devastating diagnosis among patients with end-stage renal disease. In our case, the patient was afebrile and exhibited no typical symptoms of the disease, such as vesicular rash or cranial nerve palsy. Our patient presented with a sudden onset of altered loss of consciousness, followed by an episode of generalized tonic-clonic seizures at home. One of the challenging aspects of the case was the diagnostic limitations, as the patient had bilateral knee replacements, which precluded an MRI. The gold standard for diagnosing VZV infection is VZV DNA Detection by PCR, with a specificity of 95% but a sensitivity of 30%. In our case, CSF Culture was sent earlier at the time of hospital presentation, and later reported VZV as the patient was already commenced on empiric treatment for meningitis.

VZV causes herpes zoster upon reactivation, as the virus remains latent in the dorsal root or trigeminal ganglia and is controlled by cell-mediated immunity. VZV reactivation occurs in patients with immunocompromised status, advanced age, and malignancy. Patients with end-stage renal disease and on dialysis are immunocompromised and are twice as likely to develop herpes zoster as the general population [3].The drug of choice for the treatment of VZV meningitis is the antiviral agent Acyclovir, which requires renal dose adjustment. Acyclovir itself can pose neurological symptoms due to toxicity, mimicking encephalitis. It becomes challenging to identify the true culprit, as measurement of acyclovir levels is not common in clinical practice. Since the patient in our case was on hemodialysis, this helped in drug clearance. Therefore, it was ensured that acyclovir should be administered after the dialysis session to achieve therapeutic outcomes.

Adam A. et al [4]. Reports a case of a 23-year-old male, previously taking immunosuppressive drugs for a kidney transplant, who presented with vesicular rash all over the body, with more predominance on the head and trunk. Presentation with classical picture aid; early recognition of varicella infection; patient remained on an extensive 21-day course of antiviral therapy (acyclovir) and improved drastically, with no fever or chills reported. However, in our case, no vesicular rash or cranial nerve involvement was present. Additionally, her bilateral arthroplasty precluded an MRI, further limiting diagnostic accuracy. She was diagnosed with BioFire film array for meningitis and encephalitis panel. She was administered Acyclovir on the within the first 24 hours of her presentation.

The literature suggests that vaccination against Herpes Zoster and varicella can prevent complications, including postherpetic neuralgia. Currently, the data suggest that two vaccines are available: a live attenuated Zoster vaccine and a recombinant Zoster vaccine, which later provide superior, long-lasting protection against the virus [5]. Tseng et al [6]. Reported that early vaccination after the initiation of dialysis significantly reduced the incidence of herpes zoster in elderly patients with end-stage renal disease.to our knowledge, only a few cases of VZV infection have been reported among patients on maintenance dialysis. We have compiled cases reported in patients with VZV infection.

Description	Case 1	Case 2			Our Case
Age	64	70			56
Sex	Female	Male			Female
Underlying	Diabetic	Hepatitis	C,	End-	Diabetes Mellitus,

Disease/ Comorbidity					
nephropathy, end-stage renal disease on maintenance dialysis					
stage renal disease on maintenance dialysis					
end-stage renal disease	on maintenance				
dialysis					
Complaints	Vesicles,	eyelid			
Right orbital pain +					
Generalized	tonic				
	edema,	and	nausea		clonic seizures, Fever (high grade)
	trigeminal involvement				
Area of Skin rash	First branch of	the left	Right	periorbital	No rash noted
trigeminal nerve vesicular rash in the throughout the					
			ophthalmic division		course
			of the trigeminal		
			nerve		
Complication	None		None		
Renal Function	3.54 mg/dl		Not mentioned		10.12 mg/dl
CSF Presentation	Cell count 197/ uL,		Cell count 108/ cmm,		WBCs 60 cells/uL,
	lymphocytes 108/uL,		90% mononuclear		Neutrophils 15%,
	neutrophils 34/ uL,		cells, 10%		Lymphocytes 85%,
	monocytes 50/uL,		polymorphs, total		Glucose 77 mg/dl,
	total proteins 87.5		proteins 0.84 g/l,		Protein 149 mg/dl,
	mg/dl, glucose 73		glucose 3 mmol/L		LDH 25 U/L.
	mg/dl				
Culture s	Negative Blood,		Negative		Blood Culture
Sensitivity	Urine, and CSF		Viral PCR Screen		Negative,
	Culture.		detected: Positive		Diagnosed on
			VZV		BioFire Film Array

Treatment	Acyclovir for 2 weeks		Intravenous Acyclovir		Intravenous
			+ oral Steroids		Acyclovir for 14
					days along with
					Meropenem (For
					sepsis)
Outcome	Recovered		Recovered		Recovered
Reference	Watanabe A, et al (7)	Yasser	W	Al-Mula	Current case
	Abed (8)				

Conclusion

Early recognition, prompt diagnosis, and initiation of antiviral therapy are important in mitigating the risk of morbidity and mortality among patients with an immunocompromised state. Varicella infections (meningitis and encephalitis) are more prone to cause disease among immunocompromised patients than in the general population. The publication calls for consensus policies regarding the administration of varicella zoster vaccination in dialysis patients, as they must be aware of VZV complications, morbidity, and mortality.

Conflict of interest

Nothing to disclose

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Ethical approval

Study exempted by the institute.

Consent

After taking a written informed consent from the patient, visuals and data have been provided for publication. A copy of informed written consent is also available upon request.

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