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Nosocomial Infections in Hemodialysis Patient: What Healthcare Professionals Neglect?

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Abstract: Chronic kidney disease is a renal disorder that results over a long period of time. If untreated, chronic kidney disease leads to development of end stage renal failure or chronic kidney failure. Healthcare professionals face exclusive challenges while dealing with such patients as there is significant risk of nosocomial infections in these patients. Following is a case of 76 years old Malay lady on maintenance hemodialysis who suffered HAI due to catheter related infection. Presence of comorbidities and negligence to identify drug interactions worsen her condition resulting in prolong hospitalization and decrease quality of life.

Key words: Chronic Kidney Disease · Hemodialysis · Healthcare Professional · Infection · Patient

INTRODUCTION

Over the period of time, kidney loses its function more severely and if untreated chronic kidney disease leads to development of end stage renal failure or chronic kidney failure [1]. End stage renal failure patients especially those undergoing maintenance hemodialysis are more susceptible to infections because of weakened immune system, presence of comorbidities and persistent use of catheters. Healthcare professionals face exclusive challenges while dealing with such patients as there is significant risk of nosocomial infections in these patients. Nosocomial infections are the infections that are acquired by patients as a result of surgical procedures, use of contaminated injections, over and under use of antibiotics and use of indwelling medical devices such as catheters [2]. Minimizing such infections and improving patients' quality of life should be main priority of healthcare professionals. Current case sheds light on the issue of HAI followed by negligence on part of primary care providers.

Case Presentation: A 76 years old Malay lady on maintenance hemodialysis secondary to hypertension complained of severe episodes of rigor, chills and acute high fever only after 15 minutes of her scheduled dialysis session. Patient was immediately admitted to medical ward. Medical history showed that she has been suffering from diabetes mellitus (DM) from past 15 years and also had ischemic heart disease. Upon admission, patient complained of severe cough for past 5 days that has been accompanied by other symptoms such as shortness of breath, palpitation, diarrhea and abdominal pain.

After being admitted to hospital, patients vitals were recorded as blood pressure 152/79 mmHg, pulse rate 88bpm, body temperature 101 °F and blood test showed WBC (White blood cells) as 14.72 billion cells/ L and secondary anemia. Abnormally high amount of WBC and acute high fever immediately after hemodialysis indicated catheter infection. As patient was feeling shortness of breath and palpitations, an electrocardiogram was done that showed depression in T-wave which is one of the characteristics of acute myocardial ischemia.

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Managing comorbidities itself is a challenge in end stage renal failure patient, current case became more complicated due to severe acute catheter infection. In order to cope up with severe infection, patient was prescribed Ceftazidime (1g once daily) and Cloxacillin (1g four times daily) as empirical treatment. Additionally, Mupirocin cream was applied topically at the site of route of catheter. For stabilizing patient condition and to treat comorbidities various other drugs were given that are shown in medical chart below. After 4 days of being admitted, patient still felt lethargic and complained of on and off cough. On 5th day, results of blood culture and sensitivity test showed enterococcus faecalis as the causative agent of infection and the physician decided to continue previously prescribed regime. Next day, patient developed fever (body temperature: 100 °F) with dry cough. Oral intake was minimal and patient still complained of being lethargic. Potassium tablets twice a day was added by physician in the patient medical chart. After two days, patient still experienced low grade fever and weakness. Intravenous Vancomycin 1g was prescribed to patient on non-dialysis days. After that, patient was prescribed Benadryl syrup for dry cough and intravenous antibiotics were converted to oral dosage forms. Finally after fourteen days, patient body temperature went back to normal but despite of the fact that patient continued her antihypertensive regularly, her blood pressure was not controlled. Patient was then discharged from hospital (on seventeenth day) free of infection and fever but still patient experienced high blood pressure.

Medical Chart:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
									IV vancomycin 1g OD							
IV Ceftazidime 1g OD IV Cloxacillin 1g QID																
Chlorphenamine maleate 4mg TDS																
	Mist KCL 15ml BD															
	Slow K ll/ll BD			Slow K ll/ll BD												
			Furosamide 40mg TDS Felodipine 20mg OD													
Pantoprazole 40mg OD Vitamin B complex l/l OD Ferrous Fumerate 200mg OD Folate 5mg OD Calcium Carbonate 1g TDS Cardiprin (aspirin + glycine) 100mg OD																
			Bromhexine 8mg TDS													
			S/C actrapid stat 10unit TDS													
										a						
								b								c
										d						d

a)Cloxacillin 500mg
b)Paracetamol 1g PRN
c)Mupirocin cream for LA
d)Syrup Benadryl 15ml TDS

DISCUSSION

Hemodialysis patients are particularly more prone to infections due to weak immune system and presence of one or more comorbidities in most cases [1]. Dealing with such patients require extra care on part of healthcare professionals as a minor negligence would ultimately affect patient quality of life and prolong illness as well as duration of hospitalization [3]. In current case, although patient was discharged after infection was cured but still during patients' stay in hospital and even at time of discharge, patients' blood pressure was high and also patient complained of being lethargic. Physician has completely ignored both problems and did not pay attention towards these issues. There are several drug-drug interactions in current patients medical profile that gives answer for uncontrollable blood pressure and lethargy.

Calcium carbonate and ferrous fumerate has been pres cribed concurrently by physician. As calcium carbonate is an antacid it would react with iron in ferrous fumerate and results in precipitation of iron salts leading to decrease absorption of iron. Similarly pantoprazole will also lead to decrease absorption of iron [4]. As patient already suffered from anemia, these interactions would decrease efficacy of iron salts in preventing anemia and as a result patient constantly complained of being lethargic that is one of the characteristics of anemia. Very low iron in patients already suffering from anemia may worsen their anemic condition. Secondly uncontrollable high blood pressure of this patient is due to the fact that physician is concurrently using calcium carbonate and felodipine (Calcium channel blocker). Calcium carbonate would interact with felodipine and decrease its efficacy in controlling blood pressure [4]. By closely monitoring patient blood profile and giving attention to patients' complains, these interactions would have been ruled out by physician easily and alternatives can be prescribed.

CONCLUSION

End stage renal failure patients require extensive care by healthcare professionals. By maintaining strict prophylactic measures against catheter related infections and controlling comorbidities, by focusing on patient medical and lab profile, would help in providing appropriate care to patients, improve quality of life and reduce duration of hospitalization.

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