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Case Report: Post-surgical Patient Management and Compliance

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Abstract

The pharmacist plays a crucial role in ensuring optimal patient outcomes, by working with the healthcare team as well as educating the patient. This study focuses on two major aspects that affect patient outcome: pharmacist intervention during the provision of healthcare and patient compliance.

Case presentation: YT is a 42 year old Malay male who was referred for the presentation of back and axilla carbuncles 3 days before admission. The patient has a history of diabetes mellitus, hypertension and hyperlipidemia since 2008. He has undergone saucerization surgery for the removal of the carbuncles and has responded well to therapy. His diabetes and hypertension are uncontrolled while his hyperlipidemia status is unknown due to lack of lipid profile data.

Clinical evaluation: Patient's main issue is non-compliance of drug regimen leading to poorly controlled disease states. Insufficient dose of medication also contributed to poor control. There were also a number of lab data, such as prothrombin time, INR value and lipid profile data that were not addressed during admission. Pharmacist's Intervention is crucial in ensuring optimal patient outcomes.

Introduction

Pharmacists play a crucial role in ensuring optimal patient outcomes, by working both with the healthcare team as well as with the patient. This study focuses on two major aspects that affect patient outcome: pharmacist intervention during the provision of healthcare and patient compliance. As professionals highly skilled in the knowledge of drugs, pharmacists play a key role in the healthcare team in the provision of healthcare to patients. Among their roles include identifying drug-drug interactions, recommending more suitable drug regimens, detecting drug induced symptoms and so forth. While a good healthcare system is essential for good patient outcome, it is also important for the patient to cooperate. One of the major barriers for good patient outcomes is patient non-compliance. Patient non-compliance can be caused by various reasons: forgetfulness, misunderstanding, lack of education or just plain ignorance of advice from healthcare professionals [1]. Non-compliance can lead to serious consequences towards the patient's health and wellbeing, and would make even the most well planned regimen redundant if the medications are not administered at the correct dose, route, timing and method. Pharmacists are in the prime position to tackle this problem by providing education, advice and recommendations for patients.

Case Presentation

YT is a 42 years and 9 months old Malay male who has been admitted from 29/3/2011 till 4/4/2011. He is a referred case for the presentation of back and axilla carbuncles 3 days before admission, reporting with pain, pustular in nature and presence of blood. Prior to the episode the patient experienced fever, flu, chills and cough. His medical history includes diabetes mellitus, hypertension and hyperlipidemia from 2008 till present, with the diabetes and hypertension being uncontrolled while the status of hyperlipidemia is unknown due to lack of lipid profile data. YT has a family history of diabetes and hypertension. His medication history includes subcutaneous Novomix®, Telmisartan 20 mg once a day, Amlodipine 10 mg once a day, Atorvastatin 20 mg once a day and Aspirin 150 mg once a day. He has undergone saucerization surgery for removal of the carbuncles on 1/4/2011 which has had no complications thus far. Prior to surgery all his medications have been withheld, and has been fully restarted by 4/4/2011. A summary of his medications during admission and discharge are included in the Tables 1 and 2.

	29/3	30/3	31/3	1/4	2/4	3/4	4/4
Antibiotics							
IV. Cloxacillin 500 mg stat	√						
IV. Cloxacillin 500 mg QID	√						
T. Cloxacillin 500 mg QID		√	√	√	√	√	
Surgery Medication							
IV. Fentanyl 100 mg				√			
IV. Propofol 100 mg				√			
IV. Parecoxib 40 mg				√			
IV. Morphine 2 mg				√			
IV. Rocuronium Br. 50 mg				√			
Pain Management							
IV. Tramadol 50 mg TDS	√						
IV. Parecoxib 40 mg BD						√	
Celecoxib 200 mg BD						√	
Diabetes Mellitus							
S/C Actrapid 10 Ü TDS						√	
S/C Novomix 30							√
Hypertension							
T. Amlodipine 10 mg OD							√
T. Telmisartan 20 mg OD							√
Hyperlipidemia							
T. Atorvastatin 20 mg OD							√
Cardiovascular							
T. Aspirin 150 mg OD							√

Table 1: Medication during admission.

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Medication	Regimen
Celecoxib 200 mg	BD x 1/52
T. Aspirin 150 mg	OD
T. Amlodipine 10 mg	OD
T. Atorvastatin 20 mg	OD
T. Telmisartan 20 mg	OD
S/C Novomix 30	28 Ü 9 am, 22 Ü 7 pm

Table 2: Discharge medication.

The patient was given cloxacillin as prophylaxis according to the National Antibiotic Guideline [2]. In addition to his chief complaint and medical history, a review of his organ system shows that he experienced constipation, diarrhea and dysuria. Prior to referral, lab data revealed that his white blood cell (WBC) count is above range (23, normal range: 4.5-10 × 10^3/mm^3), prothrombin time (PT) is above range (15, normal range 10-12), International Normalized Ratio (INR) is below range (0.99, normal range 2-3) and haemoglobin (Hb) is below range (10.78, normal range 11-17 mmol/L). These abnormal lab data have not been addressed during admission. Patient has no known drug allergies.

Clinical Evaluation

Drug related problem 1

Lab data taken prior to referral revealed PT time was above range, meaning that the blood takes longer than usual to clot. A possible explanation to this may be the long term use of broad spectrum antibiotics. While it is unknown whether the patient has been on broad spectrum antibiotics in the previous institution he was treated in, it may be possible that he has been prescribed broad spectrum antibiotics due to presentation of fever, flu, chills and cough before he presented with carbuncles on his back and axilla. Also, during admission the patient has been given cloxacillin 500 mg QID from 29/3 till 3/4. It has been reported that penicillin, a group of broad spectrum antibiotics, possess thromboplastic qualities and could affect PT time [3]. Despite the abnormal PT data this information has not been attended to and the patient has been discharged without having this issue addressed.

Drug related problem 2

Lab data taken prior to referral also revealed that the patient's INR value is below range, meaning that the patient is at a higher risk for the formation of blood clots, despite being on aspirin 150 mg OD. It is unknown of what is the cause for this low value, though probable causes can include non-compliance to antiplatelet regimen, insufficient aspirin dose or increased aspirin elimination due to other factors such as drug-drug interactions. It has also been reported that there are some patients that are resistant to the antiplatelet effects of aspirin [4]. Regardless of the cause, this finding is of high importance and should be looked into and stabilized before patient discharge. However, the patient was discharged without having this issue resolved.

Drug related problem 3

Aspirin was prescribed for the protection of the cardiovascular system as YT is diabetic and also has hyperlipidemia. However according to the eTG, antiplatelet medications, including aspirin, are no longer recommended for primary prophylaxis, and trials on diabetic patients have proven that there is no evident benefit. Furthermore, YT's cardiovascular risk is already reduced by the intake of antihypertensive drugs and statins [5].

Drug related problem 4

The patient has hyperlipidemia and is on atorvastatin 20 mg OD. However, there is no lipid profile data available for this patient, nor has there been any test ordered during his admission to determine his lipid profile. It is important to obtain this data and ensure that his lipid profile is controlled as the patient has cardiovascular risk due to his diabetic status.

Pharmacist's intervention: The pharmacist has included monitoring lipid profile as part of the pharmaceutical care plan. However there were no records of a lipid profile being done during admission.

Drug related problem 5

Data taken during the patient's admission revealed that the patient has uncontrolled diabetes and hypertension. The patient has a history of non-compliance to his medications prior to admission, so this could be a likely cause. Reasons for non-compliance were not determined. Other than non-compliance, it may also be possible that the dose of the patients diabetic and hypertensive medication are insufficient for proper control; but patient compliance should be handled first in order to see if the dose is sufficient when the regimen is followed correctly. In addition to that, it has been identified that the patient has poor control on his diet.

Pharmacist's intervention: The pharmacist in charge has identified this issue and has suggested patient education and counselling on importance of medication compliance, lifestyle modification for better blood pressure and blood glucose control, recognition of hypoglycemic symptoms and diabetic foot care. She has also recommended for the one of the patient's antihypertensive medications, telmisartan, to be increased from 20 mg OD to 40 mg OD. Frequent monitoring of blood pressure and blood glucose levels have been suggested.

Drug related problem 6

Several drug-drug interactions were present among the patient's medications during operation [6].

Parecoxib+Morphine: Parecoxib can affect metabolism of hepatic enzyme CYP2D6 and consequently increase the effect of level of morphine, leading to possible significant interaction.

Parecoxib+Cloxacillin: Both can increase the level of the other via competition of plasma protein binding and decreasing renal clearance. Significant interaction is possible.

Fentanyl+Propofol+Morphine: Potential for interaction as all increase sedation.

Fentanyl+Morphine: Potential for interaction as both increase serotonin levels.

While interactions exist, the usage of these drugs together is acceptable as the main objective is to sedate the patient for operation. Also, the increase of serotonin levels can be overlooked as the drugs are only used for the short duration of the surgery. The patient has responded well to the drugs during the surgery.

Drug-drug interactions are also present among the medications given during ward stay:

Parecoxib+Cloxacillin: Both can increase the levels of the other via competition of plasma protein binding and decreasing renal clearance and may cause significant interactions, thus it requires close monitoring.

Parecoxib+Celecoxib+Aspirin: All increase anticoagulation and therefore there is potential for interaction. They also all increase

serum potassium and hence serum potassium levels should be monitored.

Cloxacillin+Aspirin: Both can increase the level of the other via competition of plasma protein binding.

Telmisartan+Aspirin: Both can increase the toxicity of the other which may result in renal

deterioration, especially in volume depleted individuals and the elderly. Aspirin can also reduce the antihypertensive effects of telmisartan via pharmacodynamic antagonism, by decreasing the synthesis of vasodilating renal prostaglandins and therefore affect fluid homeostasis. Other than that, both drugs can increase serum potassium.

Telmisartan+Celecoxib: Interactions are similar to those between telmisartan and aspirin as both aspirin and celecoxib are NSAIDs.

Pharmacist's intervention: The pharmacist has addressed the concurrent use of parecoxib and celecoxib on 3/4 as both are NSAIDs. She suggested stopping IV parecoxib before initiating oral celecoxib for pain management. However, she has not addressed other drug-drug interactions.

Pharmaceutical Care Plan

Blood coagulation profile

The causes of the abnormal PT and INR values ought to be determined. History of broad spectrum antibiotics of the patient is needed to determine if antibiotics is the cause for the elevated PT value, and further data should be obtained to determine the pattern. The patient should not be discharged until PT is normal. As for INR, it should be evaluated if the patient should be taken off aspirin due to its lack of benefit. If aspirin is removed from his regimen, his INR value should be taken before discharging, and should fall within the range of 0.8-1.2 [7].

Lipid profile data

A test should be ordered to determine the patient's lipid profile data. Should the data fall outside the normal ranges, non-compliance should be factored in due to the patient's history of non-compliance to medication. If the patient's lipid status is still uncontrolled then dose adjustments or even switching to other statins may be necessary.

Uncontrolled diabetes and hypertension

The main reason for the patient's uncontrolled diabetes and hypertension is non-compliance to his medications. Reasons for non-compliance should be determined; possible causes of non-compliance could include forgetfulness, misunderstanding, lack of education, ignorance of advice or under the perception that compliance to drugs is unimportant. Education and counselling is crucial to tackle this problem. Dose of drugs may also need to be assessed as they could also be the cause of uncontrolled diabetes and hypertension. During the patient's admission his blood pressure and blood glucose levels should be measured regularly for monitoring.

Another point to note is that uncontrolled blood glucose levels can increase the risk of infections post operation. Hence, since the patient's blood glucose is uncontrolled, he should be closely monitored for presentation of any signs and symptoms of infection, and his wounds cleaned regularly.

Drug management

While both parecoxib and cloxacillin can increase the level of the other and may lead to toxicity, parecoxib was only concurrently given with cloxacillin for a short while as parecoxib has been given on 1/4 and ceased on 3/4. However, during that time the patient should be monitored for any signs of toxicity.

Celecoxib was started before the cessation of parecoxib. Parecoxib should be ceased before initiation of celecoxib for the patient, as both are NSAIDs.

As findings have shown that aspirin is not necessary, the patient should be taken off aspirin. The removal of aspirin will remove any problems related to its interactions with celecoxib, cloxacillin and telmisartan. As stated in Drug Related Problem 6, telmisartan and celecoxib have serious interactions which can result in toxicity, renal deterioration, elevation of serum potassium and the reduction of antihypertensive effects of telmisartan. To avoid these serious interactions, it is advisable to switch to a non-NSAID analgesic for pain management, the choice depending on the level of pain of the patient. Some examples of other analgesics include paracetamol and opioids [8]. The level of pain experienced by the patient could be assessed using a pain scale.

Patient education and counselling

The first issue to tackle is patient non-compliance as this can greatly affect the patient's road to recovery, as well as affect the management of his chronic illnesses. Emphasis should be made on the importance of drugs to control both his post-operative state as well as his chronic illnesses, and that non-compliance could lead to further complications that may necessitate further treatment or even be life threatening. Compliance aids, such as alarms and dosette boxes could be introduced and suggested to aid compliance. The patient's technique in using his insulin pen should also be re-evaluated. As a diabetic patient, YT should also be counselled on the dangers of hypoglycemia and the steps to take when experiencing a hypoglycemic episode; and diabetic foot care should be taught to him in order to avoid unnecessary infections and amputations.

Conclusions

Many processes are included in the management of a patient's healthcare and a pharmacist can aid in correcting errors or providing better solutions, as shown in the many interventions made by the pharmacist towards the care of this patient. Of the interventions made, patient education and counseling to tackle the issue of patient non-compliance is extremely important and crucial for the patient's optimal recovery. The pharmacist is in the prime position to recognize and counter patient non-compliance as they are highly knowledgeable in the management of medications and frequently have the opportunity to have face to face conversations with the patients. Pharmacists should use this opportunity to maximize the understanding of the patient's health profile, mindsets, misconceptions or any other information that could affect the overall health outcomes of the patient. Pharmacists should also be more confident and firm on their recommendations when working with other health professionals in the provision of healthcare in order for their interventions to be considered and carried out.

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