Asian Journal of Pharmaceutical and Health Sciences
www.ajphs.com

"Need of Clinical Pharmacist Intervention in irrational MI treatment; A case study"

Reshma Mariyam Johnson[1], Ashitha M.[1], Kiron S.S.[2]

1 Pharm D, College of Pharmaceutical Sciences, Govt. Medical College Kannur, Kerala, India.
2 Professor, Dept of Pharmacy Practice, College of Pharmaceutical Sciences, Govt. Medical College Kannur, Kerala, India.

ARTICLE HISTORY

Received: 15.08.2021

Accepted: 13.09.2021

Available online: 30.09.2021

DOI:

10.5530/ajphs.2021.11.18

Keywords:

irrational prescription, myocardial infarction, clinical pharmacist intervention

***Corresponding author:**

Phone : + 91 - 9447086959
Email : drkironss@gmail.com

ABSTRACT

A case on myocardial infarction (MI) is described. The subject complained of chest pain for two days aggravating 4 hours before admission to the emergency room. On evaluation the patient was diagnosed with anterolateral MI. Initial pharmacotherapy included aspirin, clopidogrel, atorvastatin, nicorandil, Inj heparin. Emergency cardiac catheterization and primary PTCA was performed. The drug therapy included aspirin, clopidogrel, rosuvastatin, carvedilol, pantoprazole, sorbitrate, injection heparin, tirofiban, ramipril, ivabradine, syrup KCl, torsemide, spironolactone, ranolazine, clonazepam. This case is a clear evidence of irrational prescription that includes polypharmacy, drug interaction and medication error. The prescription clearly depicts need of a clinical pharmacist intervention in overall therapy of the patient.

INTRODUCTION

Myocardial Infarction (MI) remains as a major cause of death and disability all over the world(1). According to Journal of the American College of Cardiology, MI is the reduced blood flow to the coronary artery resulting from atherosclerosis and occlusion of an artery by an embolus or thrombus. Myocardial infarction are of two types STEMI and NSTEMI(2).

The early pharmacotherapy for MI is recommended by the American College of Cardiology Foundation/ American Heart Association. They recommend nitroglycerin (sublingual), aspirin $P2Y_{12}$ platelet inhibitor, anticoagulants such as bivalirudin, unfractionated heparin or enoxaparin. Glycoprotein IIb/IIIa inhibitor, beta blockers, ACE inhibitors can also be administered. Statins such as atorvastatin, rosuvastatin, Calcium channel blockers; diltiazem, verapamil, amlodipine can also be added to the pharmacotherapy(3).

Tirofiban, Abciximab can be used for reperfusion(4). Studies on treatment of Nicorandil along with the coronary angioplasty have shown improved clinical outcomes when compared to coronary angioplasty alone(5).

CASE REPORT

A 52 year old male patient with a known history of systemic hypertension was presented to the emergency department with acute chest pain since two days, aggravating 4 hours before arrival. Blood pressure on admission was 180/90 mmHg. The patient was on Losartan 50 mg and Atenolol 50 mg once daily therapy. He does not have a history of smoking and alcohol use. Upon presentation, the patient was conscious and oriented. The vital signs were abnormal with a pulse rate of 100 beats/ min.

On initial evaluation, ECG, ECHO, complete blood count, renal profile, lipid profile and microbiology tests were performed. His ECG showed significant ST segment elevation, suggesting an anterolateral myocardial infarction. ECHO reports

revealed the presence of coronary artery disease. WBC and neutrophils were elevated with values; 17.3 & 2.5 respectively. Lipid profile was abnormal with serum cholesterol 217 mg/dl and LDL 144 mg/dl. Troponin I was 0.43.Final diagnosis of the patient was Acute coronary syndrome with Anterolateral myocardial infarction. The patient was immediately given with ASPIRIN 325 mg, CLOPIDOGREL 300 mg, ATORVASTATIN 80 mg, NICORANDIL 5 mg, INJ HEPARIN 8000 IU/ml. Emergency cardiac catheterization was done and primary PTCA was performed. Critical care was given and the patient was admitted to the intensive care unit.

The drug therapy was begun with ASPIRIN 325 mg, CLOPIDOGREL 75 mg, ROSUVASTATIN 40 mg, CARVEDILOL 3.125 mg, PANTOPRAZOLE 40 mg, SORBITRATE 5mg, INJ HEPARIN 4000 IU/ml, TIROFIBAN Infusion 6ml/hr 12 hrs after heparin. On day 2, SORBITRATE was withdrawn. On day 3, RAMIPRIL 2.5 mg, IVABRADIN 5 mg were added. Syrup KCl was also added to the therapy. Angiogram was performed again and Elective PTCA planned on day 11. TORSEMIDE 10 mg added on 4th day. SPIRONOLACTONE 25 mg was again added on 5th day of admission. RANOLAZINE (RANOLAZ) 500 mg added on 8th day. CLONAZEPAM 0.25 mg given before the day of elective PTCA. On day 12, RANZ (RANOLAZINE) 500 mg prescribed again. During therapy, sodium level was decreased to 126 mEq/L, potassium elevated to 5.8 mEq/L, FBS was found to be 157 mg/dl.

DISCUSSION

This case is a clear evidence of irrational prescription in the absence of clinical pharmacist intervention during the pharmacotherapy of a patient. The overall prescription of drugs was found to be irrational. The lab parameters and prescribed drugs were not comparable. Medication error was identified in the prescription. KCl and spironolactone are contraindicated with ACE inhibitors like Ramipril since it can cause hyperkalemia. Lab investigation during drug therapy has shown an elevation in potassium level after administration of these drugs. Heparin, aspirin & clopidogrel were prescribed to the patient, which is a usual prescribing pattern in coronary artery disease despite their bleeding risk. In addition tirofiban infusion was again prescribed which is an another anticoagulant which can increase the risk of bleeding when given along with all those anticoagulants and antiplatelets. As per theory, Aspirin is contraindicated with carvedilol and torsemide. The blood pressure of the patient was found to be decreasing on the successive days of admission. Eventhough, four drugs such as Ramipril, Torsemide, Carvedilol and Spironolactone having antihypertensive action were given together. They were prescribed in the discharge medication too.

Spironolactone was prescribed to the patient without considering the lab parameters. The patient already have a low sodium level, spironolactone can aggravate this condition. Also the patient had an elevated blood sugar level during therapy. Proper treatments were not given, considering this situation.

Tablet RANZ AND RANOLAZ are the drugs with same content RANOLAZINE. Both these drugs were prescribed and given to the patient on same days. This can cause overdose complications for the patient. These kinds of errors in the prescription can lead to fatal events. This can affect the quality of life of the patient. A clinical pharmacist is a health professional who can give direct care for the patient during his treatment. They can optimize the use of medication and also promote health, quality of life and disease prevention. If there was a clinical pharmacist intervention in this case, he could have prevented all these errors and continuously monitor the disease progression and lab parameters. Clinical pharmacist can improve adherence of new guidelines in pharmacotherapy. They can give awareness to the physician on medication error, over dose, under dose, adverse drug reactions, polypharmacy and adherence to standard guidelines(6). Additionally, the drug interaction observed in this case can lead to serious adverse events. Over dose can be prevented by prescription monitoring by a clinical pharmacist(7). The uniqueness of the case is that, the case includes polypharmacy, drug interaction and also therapeutic duplication. Finally, this case study clearly depicts the need of a clinical pharmacist intervention in overall therapy of the patient.

CONCLUSION

Irrational use of drugs is associated with a devastating effect on the health care system. Inadequate knowledge from the part of both physician and other healthcare service providers are the major problem of irrational prescription(8). Polypharmacy is the usual practice that leads to rationality and is the most prevalent practice. More than 5 drugs in a prescription can lead to multi drug interactions(9). We can see a greater irresponsibility from both the multinational drug companies in promoting drugs and the doctors in prescribing the drugs. It is very important that our health system should give a proper attention on this issue. A clinical pharmacist involvement in the health care team is so important that they can promote and ensure rational drug use. Because rational drug therapy can be achieved only when the use of drugs comes under a team work of health care members and not at the jurisdiction of a single physician only. The quality of health and medical care can be achieved only when appropriate use of drug is established. Irrational prescription is a hindering factor to achieve this(10). In conclusion, a clinical pharmacist can play multidisciplinary approach to achieve rational use of drug. Their participation in the health care system can ensure proper information on adverse drug reactions, dosage and frequency of the drugs to patients, and also warning and monitoring the unwanted effects of the drugs.

LIMITATIONS

We couldn't do a follow-up of the study. Also more cases in this pattern were not able to collect.

ACKNOWLEDGEMENT

We thank Dr.S.M.Ashraf for his support on the case study and data collection and also the nursing staff for their support and the patient for his cooperation.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Thygesen K, Alpert JS, White HD, null null. Universal Definition of Myocardial Infarction. Journal of the American College of Cardiology. 2007 Nov 27;50 (22): 217395.
2. Heart Attack Treatment Guideline 2013 [Internet]. CardioSmart. [cited 2021 Sep 21]. Available from: http://www.cardiosmart.org/news/2013/1/heart-attack-treatment-guidelines
3. Wells BG, DiPiro JT, Matzke GR, Posey LM,

Schwinghammer TL. Pharmacotherapy Handbook (7th Edition). [Internet]. New York, USA: McGraw-Hill Professional Publishing; 2009 [cited 2021 Oct 11]. Available from: https://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=4657304

4. Kunichika H, Ben-Yehuda O, Lafitte S, Kunichika N, Peters B, DeMaria AN. Effects of glycoprotein iib/iiia inhibition on microvascular flow after coronary reperfusion: A quantitative myocardial contrast echocardiography study. Journal of the American College of Cardiology. 2004 Jan 21;43(2):27683.

5. Ito H, Taniyama Y, Iwakura K, Nishikawa N, Masuyama T, Kuzuya T, et al. Intravenous nicorandil can preserve microvascular integrity and myocardial viability in patients with reperfused anterior wall myocardial infarction. Journal of the American College of Cardiology. 1999 Mar 1;33(3):65460.

6. Raju S, Solomon S, N N, K K, Clara Joseph A, V V. Assessment of Prescribing Pattern for Hypertension and Comparison with JNC-8 Guidelines-Proposed Intervention by Clinical Pharmacist. JYP. 2016 Apr 1;8(2):1335.

7. Mohamadloo A, Ramezankhani A, Zarein-Dolab S, Salamzadeh J, Mohamadloo F. A Systematic Review of Main Factors leading to Irrational Prescription of Medicine. Iran J Psychiatry Behav Sci [Internet]. 2017 Jun 30 [cited 2021 Oct 11];11(2). Available from: https://sites.kowsarpub.com/ijpbs/articles/10242.html#abstract

8. Rahman MS, Matanjun D, D'souza UJA, Saudi WSW, Kadir F, Song TT, et al. Irrational Use of Drugs. Borneo Journal of Medical Sciences (BJMS). 2021 Jan 31;55.

9. Patel V, Vaidya R, Naik D, Borker P. Irrational drug use in India: A prescription survey from Goa. Journal of Postgraduate Medicine. 2005 Jan 1;51(1):9.

10. Vance MA, Millington WR. Principles of Irrational Drug Therapy. Int J Health Serv. 1986 Jul 1;16(3):35562

Cite this article : Reshma Mariyam Johnson, Ashitha M., Kiron S.S.
Need of Clinical Pharmacist Intervention in irrational MI treatment; A case study
Asian J. Pharm. Hea. Sci.. 2021;11(3):2449-2456. DOI : 10.5530/ajphs.2021.11.18