A Case Report on Diclofenac Induced Chronic Kidney Disease

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ABSTRACT

Non-steroidal Anti-inflammatory Drugs (NSAID) are one of the most commonly prescribed drugs and their nephrotoxic effects are well known. Diclofenac is one of the Non-steroidal anti-inflammatory drugs that exert anti-inflammatory, analgesic and antipyretic effects through the suppression of Prostaglandin (PG) synthesis, by inhibiting the enzyme Cyclooxygenase (COX). The most important mechanism of anti-inflammatory action of Non-steroidal anti-inflammatory drugs is considered to be inhibition of Cyclooxygenase-2 (COX-2) mediated enhanced prostaglandin synthesis at the site of injury. A 65-year male case was admitted with chief complaints of bilateral lower limb swelling and facial swelling. The patient history revealed that he had taken Tab. Diclofenac in combination with Paracetamol [acetaminophen] for almost one year. The final diagnosis was made as drug induced Chronic Kidney Disease (CKD), Hypertension (HTN), bilateral lower limb cellulitis and anemia. In this case, kidney disease and overuse of Diclofenac may account for the increase in blood pressure [hypertension]. The treatment was given accordingly after 7 days of hospital stay the patient had recovered and was given discharge.

Key words: Non-steroidal anti-inflammatory drugs, Chronic kidney disease, Hypertension, Prostaglandin, Cyclooxygenase.

INTRODUCTION

Non-steroidal anti-inflammatory drugs are one of the most commonly prescribed drugs and their nephrotoxic effects are well known.[1] Diclofenac is one of the Non-steroidal anti-inflammatory drugs that exert anti-inflammatory, analgesic and antipyretic effects through the suppression of prostaglandin synthesis, by inhibiting the enzyme cyclooxygenase.[2] Chronic Kidney Disease (CKD) or Chronic Renal Failure (CRF) is a term that encompasses all degrees of decreased renal function, from damaged - at risk through mild, moderate and severe chronic kidney failure. Chronic kidney disease is defined as either kidney damage or a decreased Glomerular Filtration Rate (GFR) of less than 60 ml/min/1.73m^2 for at least 3 months. Renal functions are more prominent in geriatric population with falling renal functions.[3] We would like to report a case of Diclofenac induced chronic kidney disease which was favored by the presence of co-morbid conditions like bilateral lower limb cellulitis, hypertension and anemia.

CASE DESCRIPTION

A 65-year-old male patient was admitted in the male medicine free ward at Basveshwar Teaching and General Hospital with the chief complaints of bilateral lower limb swelling since 15 days and complaints of facial swelling since 7 days (Figure 1). The present complaints states that he had a swelling in right foot 15 days before and followed by left foot next day morning with pitting type edema (Figure 2). The patient's history stated that he had a wound on his right foot 22 to 25 days back (Figure 3). He has taken treatment Tab. Diclofenac 50mg BD and first-aid. The patient past history also revealed that he was diagnosed with Chikungunya 3 years back and was on medication Tab. Diclofenac and Tab. Dexamethasone 0.5mg, on consulting the local Primary Health

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Centre. The patient stopped taking Tab. Dexamethasone and continued taking Diclofenac whenever needed for 2 years and started taking the medicine Tab. Diclofenac + Acetaminophen every day or alternative days since 1 year for the complaint of knee joint pain. Blood pressure was found to be 180/100 mmHg [high] on examination. Hence the provisional diagnosis was done as kidney disease with hypertension.

DISCUSSION

Hemoglobin was found decreased and it signifies anemia, the patient was not pale on examining and hence the diagnosis is made as Vitamin B_{12} deficiency.

On the basis of creatinine clearance value, the CKD is categorized as Grade 4 CKD.

On the basis of clinical presentation, laboratory values (Table 1) and investigations, the final diagnosis is made as Diclofenac induced Grade 4 chronic kidney disease, hypertension, bilateral lower limb cellulitis (Figure 4) and Anemia.

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On first day tablet Telmisartan + Amlodipine was given for treating hypertension and stopped on the same day, as the patient was complaining of headache after taking the medicine. The tablet Telmisartan + Amlodipine was replaced by Amlodipine.

Table 1: Laboratory Investigation

Days		Day 1	Day 3
Tests	**Normal Values**	**Observed Value**	
Haemoglobin	13.5-17.5 g/dl	9.3 g/dl	8.2 g/dl
Platelet Count	1.50-4.00*10^3 Cells/cumm	6.98*10^3 Cells/cumm	3.52*10^3 Cells/cumm
Red Blood Cells (RBC) Count	4.3-5.9 Million cells/cumm	3.29 Million cells/cumm	
Total Count	4000-11000 Cells/cumm	9100 Cells/cumm	5700 Cells/cumm
Erythrocyte Sedimentation Rate (ESR)	15-20 mm/hr	120 mm/hr	120 mm/hr
Blood Urea	6-20 mg/dl	86 mg/dl	58 mg/dl
Serum Creatinine	0.7-1.7 mg/100ml	2.9 mg/100ml	2.5 mg/100ml
Creatinine Clearance	ml/min	16.16 ml/min	

The patient was given treatment for the above conditions after which the patient's pitting edema was reduced and urea, creatinine levels had come down and was asked to review after 15 days.

After 15 days the patient had visited Medicine Outpatient Department (OPD) again the urea, creatinine levels where

Figure 1: Anemia: Non-Paler Tongue.

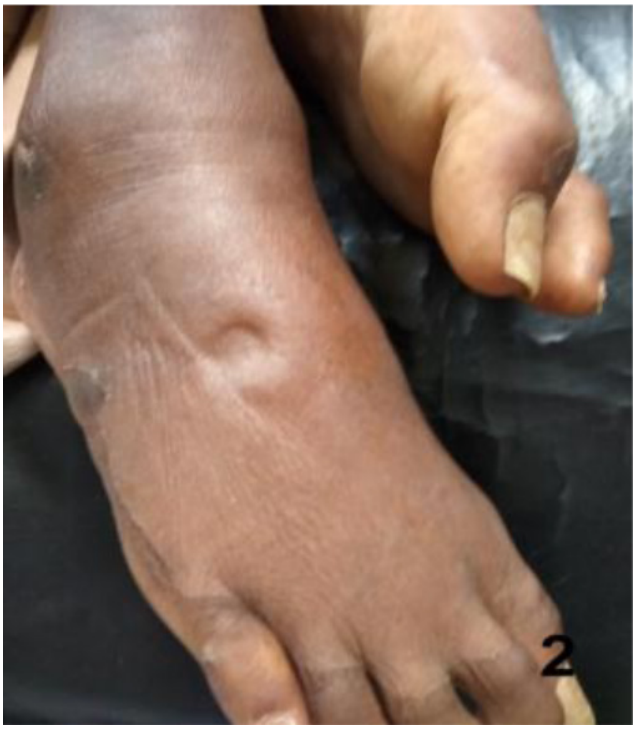

Figure 2: Pitting Type Edema.

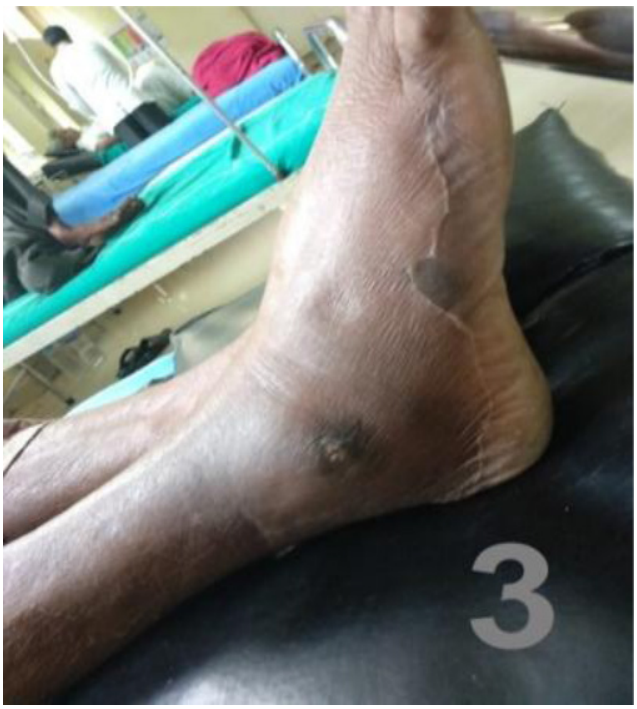

Figure 3: Wound on right leg.

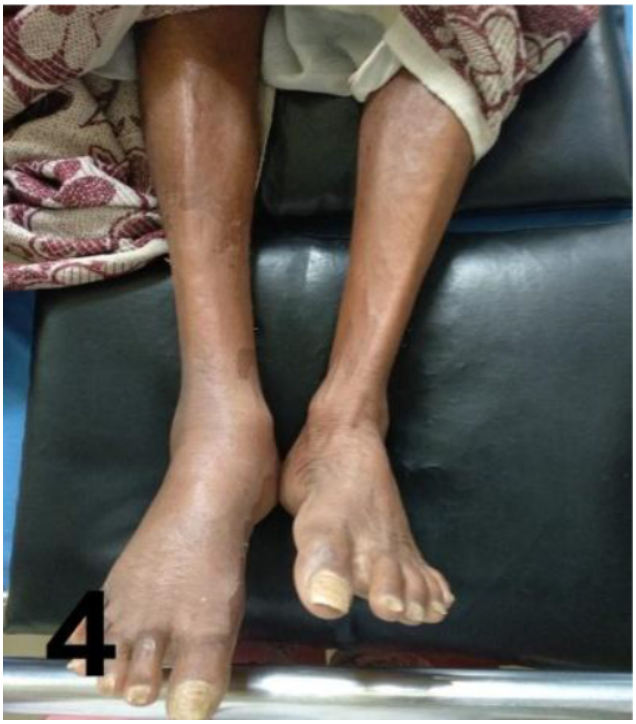

Figure 4: Bilateral Lower Limb Cellulitis.

The patient was given treatment for the above conditions after which the patient's pitting edema was reduced and urea, creatinine levels had come down and was asked to review after 15 days.

After 15 days the patient had visited Medicine Outpatient Department (OPD) again the urea, creatinine levels where checked which were normal.

Non-steroidal anti-inflammatory drugs alter renal functions through their effects on renal prostaglandins leading to reversible renal ischemia. Although Non-steroidal anti-inflammatory drugs related hypertension, salt and water retention, edema and hyperkalemia are highly infrequent but they remain a concern in patient who are at risk and can develop renal failure[1]. Prostaglandins induce hyperalgesia by affecting the transducing property of free nerve ending so that stimuli that normally do not elicit pain are able to do so[4]. Non-steroidal anti-inflammatory drugs do not affect the tenderness induced by direct application of prostaglandins but block the pain sensitizing mechanism induced by algesic substances primarily by inhibiting cyclooxygenase-2.[4] The most important mechanism of anti-inflammatory action of Non-steroidal anti-inflammatory drugs is considered to be inhibition of cyclooxygenase-2 mediated enhanced prostaglandin synthesis at the site of injury.[4]

In this case, kidney disease and overuse of Diclofenac may account for the increase in blood pressure [hypertension]. The patient had taken tab. Diclofenac in combination with paracetamol [acetaminophen] for almost one year which caused nephrotoxicity. The treatment was given for the diagnosis made and the patient was cured on discharge. He was advised to follow up every month. In this case the causality was found to be "PROBABLE" according to World Health Organization-Uppsala Monitoring Centre (WHO-UMC) assessment scale.[5]

CONCLUSION

Nowadays Non-steroidal anti-inflammatory drugs represent the most widely used drug in medical practice. Indeed, the use of this class of compounds has increased dramatically during the recent years among the patients of all ages.[6] On the basis of the specific mechanism involved in the activation, Non-steroidal anti-inflammatory drug induced nephrotoxicity should be considered as significant adverse effect. Thus, monitoring of renal function and serum creatinine levels is mandatory during therapy, together with assessment of electrolytes and blood pressure.[6]

Patient Counselling [Education]

Patient was educated about the adverse effect of the medication, follow up visits for monitoring symptoms and nephrotoxicity. Patient was educated for taking the medications only by physician advice. Alert card was issued to the patient and was advised to show it to the physician before taking the prescription.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

NSAID: Non-steroidal anti-inflammatory drugs; **PG:** Prostaglandin; **COX:** Cyclooxygenase; **COX-2:** Cyclooxygenase-2; **CKD:** Chronic Kidney Disease; **HTN:** Hypertension; **CRF:** Chronic Renal Failure; **GFR:** Glomerular Filtration Rate; **RBC:** Red Blood Cells; **ESR:** Erythrocyte Sedimentation Rate; **OPD:** Outpatient Department; **WHO-UMC:** World Health Organization - Uppsala Monitoring Centre.

SUMMARY

Diclofenac have been reported to cause nephrotoxicity, which is considered as significant adverse effect. Discontinuation of the medication will help to improve the renal function, even though diclofenac is needed for better outcome in majority of the patients.

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