Annals of Clinical Case Reports

Case Report
Published: 25 Jul, 2022

Unusual Case of Elevated Blood Pressure - A Case Report

Revanth VSS Challa, Vishwanath Krishnamurthy and Maheswari E*

Department of Medicine, M S Ramaiah Medical College & Hospital, India

Abstract

A wide variety of drugs and other chemical substances possessing a therapeutic value can induce either a transient or persistent elevations in the blood pressure, besides this also interact with some of the blood pressure lowering drugs hence reducing their efficacy. Some involve in sodium water retention and the others activate the sympathetic nervous system either directly or indirectly, however the drugs which induce elevations in the blood pressure levels involving the arteriolar smooth muscle do not have an established mechanism of action. However, some of the other classic anti-hypertensive also involve in elevating the blood pressure levels after discontinuation (rebound hypertension) is still a paradoxical effect. In majority of the cases the elevations in the blood pressure levels are for a short period and is predominantly transient some also involve in complications including stroke, encephalopathy, and renal failure etc. the fatal effects are more prominent among pre-hypertensive. Hence it is very important to evaluate use of any other concomitant medication and identifying the drug involved in elevating the blood pressure levels thereby avoiding the unnecessary initiation of anti-hypertensive regimen. Once the drug involved is identified it is usually discontinued or dose adjusted in cases where its use is obligatory. The present case summarizes the therapeutic agents or chemical substances that elevate blood pressure and their mechanisms of action.

Introduction

Non-Steroidal Anti-Inflammatory Drugs (NSAIDS) being the standard of care for decades in treating fever, pain and a wide range of other inflammatory diseases are never free of their side effect profile which includes gastrointestinal toxicity; aspirin induced asthma, tinnitus, hepatotoxicity and nephrotoxicity. NSAIDS usually act by inhibiting the prostaglandin's synthesized by dual isoform enzymes Cyclooxygenase -1 (COX 1) and Cyclooxygenase -2 (COX-2). Etoricoxib being one of the latest COX-2 inhibitors developed and is best used in chronic pain and rheumatic conditions having restricted quality of life, including elderly patients with fewer gastro intestinal side effects compared to non-selective NSAIDS. Data was collected from 45,451 patients through 19 clinical trials. Interestingly, to certain extent, there appeared greater blood pressure elevation with COX-2 inhibitors compared with placebo and nonselective NSAIDs (e.g., ibuprofen and diclofenac). Etoricoxib when used in known hypertensive patients was associated with greater discontinuations due to elevated blood pressure levels when compared to other NSAIDS. The incidence of elevated blood pressure levels has been challenging to quantify due to its relatively uncommon clinical entity, and also due to under-recognition of the occurrence. So, use of etoricoxib among hypertensive will remain a clinically important etiology of elevated blood pressure levels, making timely and accurate reporting of this incident as important for the early detection and awareness of drug-induced hypertension.

We present a case of hypertension associated with etoricoxib use. Etoricoxib is a selective COX-2 agonist and is supplied as an orally administered tablet. It may be used alone or in combination with other GABA-A agonists such as thiocolchicine as a first-line therapy for muscle spasm and pain. Commonly reported side effects to etoricoxib include nausea, vomiting, dizziness, headache and sleep disturbances. To date, there has been only one published case report of etoricoxib-associated hypertension.

Case Presentation

A 48-year-old male who is a pre-hypertensive who is not on any medication and has a controlled blood pressure of 130/90 mmHg with DASH diet, and appropriate life style modifications, had come for a routine checkup and had blood pressure of 136/80 mmHg [1].

Repeat blood pressure levels were measured on the next visit was elevated to 166/90 mmHg [2].

OPEN ACCESS

Correspondence:
Revanth VSS Challa, Department of Medicine, M S Ramaiah Medical College & Hospital, New BEL Road, M S Ramaiah Nagar, Bengaluru, Karnataka-560054, India, Tel: 9573324182;
E-mail: revanthchalla1997@gmail.com

Received Date: *10 Jun 2022*
Accepted Date*: 18 Jul 2022*
Published Date*: 22 Jul 2022*

Citation:
Challa RVSS, Krishnamurthy V, Maheswari E. Unusual Case of Elevated Blood Pressure - A Case Report. Ann Clin Case Rep. 2022; 7: 2267.

ISSN: 2474-1655.

On taking patient's history he did not give any change in lifestyle or work atmosphere and also denied the use of any other chronic concomitant medication [3].

Since his blood pressure was persistently elevated 170/100 mmHg on repeated monitoring plan was to start him on medications subsequently [4].

When the patient was repeatedly questioned about the use of other medications for any other comorbid conditions, he had confirmed the use of etoricoxib, which was prescribed to him by an orthopedical on a visit for his neck, and lower back ache [5].

Patient had admitted that he had taken 2 tablets of 90 mg etoricoxib for his pain which he had denied to accept in his first visit. Later he was advised to stop etoricoxib and serial monitoring of blood pressure had fallen to 140/90 and 130/80 mmHg respectively not requiring any other antihypertensive therapy [6].

Thus, meticulous history taking about use of chronic concurrent medications emphasizes its importance to know about any changes in the underlying pathology of the patient [7].

Salt intake has a greater impact on adequate control of blood pressure in patients especially in an Indian setting being the "salt sensitive hypertensive's" restriction in salt intake has a greater influence lowering the blood pressure levels [8].

Discussion

Drug induced elevated blood pressure levels is caused due to wide range of drugs, both prescription and non-prescription, and is termed drug induced drug induced hypertension. Drug induced hypertension may range in severity from asymptomatic mild to severe elevations in blood pressure levels leading to renal damage as an end organ damage and death in some. Currently there are many drugs which are suspected to cause drug induced hypertension, NSAIDS cause elevated blood pressure by influencing prostaglandin production causing adverse renal effects. Current case report etoricoxib may increase the blood pressure levels in dose dependent way and represents as interaction between the drug and the prostaglandin synthesis leading to elevated blood pressure levels. The majority of drugs which are involved in elevating the blood pressure levels are not associated with any hypertensive risks in preclinical and clinical stage testing of the drug. Several factors contribute to the under reporting of incidence as occurrence may be noted in fewest of the patients exposed to the drug, relatively small population of clinical drug trials with respect to detecting such an uncommon adverse effect, etc. This can be, best explained with a similar COX- 2 inhibitor rofecoxib (vioxx) which was, best used in juvenile arthritis, migraine, and acute pain had a greater risk of elevating the systolic and diastolic blood pressures when compared to other traditional NSAIDS. This drug was voluntarily withdrawn from the market in 2004 concerning the increased risk of elevated blood pressure levels, greater risk of heart attack and stroke. Therefore, it may not be of a greater importance until the drug comes in to the market and thousands of patients are exposed to the drug and its adverse effect gets to be recognized. This is a major limitation for the clinicians with respect to reporting of the adverse effects suspected by food and drug administration.

Elevated blood pressure levels after the administration of drug might be challenging as there are no specific diagnostic tests related to elevations in blood pressure levels exist only serial monitoring could predict elevations in blood pressure. The diagnosis of this drug induced hypertension may be even more challenging in case, if the patient has any other underlying co-morbid conditions and concurrent use of any other drugs which may elevate the blood pressure.

In the present case hypertension due to etoricoxib was the most likely etiology of patient's elevated blood pressure. Extensive monitoring to rule out other causes for the hypertension showed the elevation in his blood pressure levels were only associated to the drug as the patient neither had any other conditions nor used any other drugs which contribute to the elevations in the blood pressure.

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) have potential impacts on blood pressure. NSAIDs inhibit both Cyclooxygenase (COX-1) and COX-2 isoforms, which prompts a decrease in prostaglandin synthesis. The advantages and the awful effects of this class of drugs are widespread. Drug induced hypertension related with NSAIDs is because of the renal impacts of these medications. In particular, NSAIDs cause enzyme related increments in sodium and water retention. Dose related administration of these drugs lead to sodium water retention; this effect is more pronounced with COX-2 inhibitors when compared to other NSAIDS.

The COX-1 and COX-2 enzymes are both originated in kidney in the glomerulus and the macula densa respectively. The specific location of these isoforms in the kidney has an impact on renal function. The prostaglandins produced by COX-1 basically maintain renal homeostasis by promoting vasodilation in the renal vascular bed, decreasing renal vascular resistance and thereby, increasing the renal perfusion. Prostaglandins created by the COX-2 isoenzyme have diuretic and natriuretic effects. In patients who are hemodynamically compromised, the impacts of the two isoenzymes are fundamental for the upkeep of renal perfusion, as a result of their vasodilatory impacts. Since NSAIDs inhibit the synthesis of COX-1 and COX-2 prostaglandins, renal effects are more pronounced in 1% to 5% of NSAID users. COX -2 plays an important role in maintaining the natriuresis when inhibited leads to sodium water retention and further activates vasoconstrictive substances such as endothelin 1 and hence thereby induction of hypertension in normotensive or controlled hypertensive patients.

Assessment of causality in the suspected adverse drug reaction remains a challenge however two scales were used to assess the severity of ADR. Naranjo causality assessment scale was used which gave a score of 7 (5-8 probable). Another standardized measure or the causality used is the WHO-UMC scale which is the gold standard for the assessment of severity of the events for individual case reports also established a probable/likely relation between the drug and the adverse event. Hence, the assessment of severity on both the scales indicated a probable relationship between the drug and the occurrence of ADR. The drug was however de-challenged after elevation in blood pressure levels and re-challenge with etoricoxib was not attempted in our patient due to concerns for his safety.

Pharmacoepidemiological data also suggest that the existing co-morbid conditions and physiochemical properties of the classes of drugs also play an important role in elevating the blood pressure. Pharmacokinetics suggest that etoricoxib is extensively metabolized by liver and excreted by urine and henceforth is not recommended in patients with End Stage Renal Disease (ESRD) which in turn imposes the risk of hypertension.

Two meta-analyses also showed an evidence of elevated blood

pressure with selective NSAIDS in comparison to other traditional NSAIDS. Among these selective COX-2 inhibitors such as rofecoxib and etoricoxib have the highest evidence of elevating the blood pressure in comparison to other drugs such as celecoxib. In an RCT conducted there were 397 incidences of hypertension related ADR and 81 discontinuations of drug due to any hypertension related ADR which was relatively high in comparison to celecoxib and diclofenac. Therefore, there exists a greater evidence of safety profile for celecoxib and other NSAIDS in comparison to etoricoxib. Hence, in future cases associated with such an elevation in blood pressure with concurrent use of etoricoxib should be, reported and efforts should be made to depict the underlying mechanism for occurrence of the incident.

Conclusion

Etoricoxib being an effective analgesic drug having advantage over other traditional NSAIDS is used for osteoarthritis, gouty arthritis etc. There are very few evidences about etoricoxib elevating the blood pressure levels in a controlled hypertensive or normotensive patients. Acute elevations in blood pressure should be suspected in patients with use of etoricoxib, is a primary cause for secondary hypertension (drug induced). These elevations in blood pressure levels are usually short lived and rare hypertensive emergencies are associated with concurrent use of these drugs and are reversed once the suspected drug is de-challenged, and thus achieves adequate blood pressure control. Hence, use of etoricoxib should be contraindicated in patients who have poor hypertensive control and in the 'patients who have BP>140/90 mmHg. In cases where use of etoricoxib is mandatory' patients should be added with anti-hypertensive therapy monitored for two weeks after the start of the treatment and regularly thereafter.

References

1. Contreras AE, Cervantes JVM, Collantes-Estevez E. Update on the clinical pharmacology of etoricoxib, a potent cyclooxygenase-2 inhibitor. Future Rheumatol. 2007;2(6):545-65.
2. GOOD D. NSAIDs appear to increase blood pressure more than celecoxib. Medscape. 2019.
3. GOV.UK. Etoricoxib: Prescribing to patients with high blood pressure. 2019.
4. NPS MedicineWise. Etoricoxib (Arcoxia): Be aware of hypertension risk. 2019.
5. Krum H, Swergold G, Curtis SP, Kaur A, Wang H, Smugar SS, et al. Factors associated with blood pressure changes in patients receiving diclofenac or etoricoxib: Results from the MEDAL study. J Hypertens. 2009;27(4):886-93.
6. Walker C. Are all oral COX-2 selective inhibitors the same? A consideration of celecoxib, etoricoxib, and diclofenac. Int J Rheumatol. 2018;2018:1302835.
7. Sprague D, Bambha K. Drug-induced liver injury due to varenicline: A case report. BMC Gastroenterol. 2012;12:65.
8. Hulisz D, Lagzdins M. Drug-induced hypertension. 2019.