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Online at: http://www.iajps.com *Case Report*

SEVERE HYPERURICEMIA DUE TO INDISCRIMINATE TORSEMIDE USE

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Abstract:

Torsemide, a pyridine sulfonylurea class of loop diuretic indicated for the treatment of edema associated with congestive heart failure, renal failure or chronic liver disease. Rare side effects such as hypocalcaemia, hypomagnesaemia, and hyperglycemia have been noted with the usage of torsemide.

Here we report a case of 66-year-old man with mild symptoms having high uric acid levels following prolonged self-administration of torsemide.

Keywords: *Torsemide, loop diuretic, edema, uric acid, renal failure*

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INTRODUCTION:

Hyperuricemia is an excess of uric acid in the blood. Normal uric acid levels in males are 2.5-7.5mg/dl and 2.4-6 mg/dl in females. Elevated levels is the result of increased production, decreased excretion of uric acid, or combination of both process[1].Hyperuricemia is a common adverse effect of thiazide group of diuretics. High uric acid levels are associated with increased risk of coronary artery disease and malignancy[2].

Torsemide is a loop diuretic that belongs to the pyridine sulfonylurea class, indicated for the treatment of edema associated with congestive heart failure, renal failure or chronic liver disease. Oral torsemide dosages without diuretic effect have been used to treat essential hypertension as well[3]. Here we report a case of indiscriminate self-administration of torsemide resulting in nearly threefold rise in uric acid levels.

CASE REPORT:

66-year-old shop owner who was most of the time standing reported to OPD on 17-6- 2019 with complaints of chest pain and prolonged history of pedal edema and border line creatinine rise. He was a normotensive individual who was treated with diuretic for more than one year. On examination he was afebrile BP 136/70 mmHg, PR 70/min, respiration 18/minute and JVP was normal at 45 degrees. He had bipedal pitting edema and non-specific arthralgia. CNS, RS, CVS and abdomen examination were unremarkable and his edema was diagnosed as benign postural edema. All his laboratory parameters were within normal limits with a high normal uric acid (6.73 mg/dl)as shown in table no1 . He was advised diuretic (torsemide) 10 mg for 7days. Thereafter the patient did not report for follow up for one year. He came back for review after 1 year (30-10-2020) complaining of pedal edema and bilateral ankle and wrist arthralgia. On examination he had bilateral pitting pedal edema and signs of inflammation on the left ankle joint, no other joints were involved. His BP was 140/80 mmHg, PR 62/min, CVS and RS were unremarkable. His laboratory tests showed sr creatinine 1.32 mg/dl and uric acid 19.44 mg/dl. (Table 2)

On further enquiry he revealed that he had been consuming diuretic Dytor (Torsemide) 10 mg for the past 1 year. Rise in uric acid level was attributed to unwarranted use of diuretic, torsemide. Though there were no appreciable regression of edema after discontinuing of diuretics.

Table 1

Parameters	Observed values	Normal values
TLC	7500/µL	4800-10800 µL
RBC	4.8Million	4.4-6Million
Platelet	1.5Lakh/µL	1.5-4.5Lakh/µL
Hb	13.8g/dL	12-17g/dL
ESR	28mm/hr	0-15mm/hr
CRP	20mg/L	0-10mg/L
Uric acid	6.73 mg/dL	2.5-7mg/dL
Creatinine	1.28 mg/dL	0.6-1.3mg/dL

Table 2

Parameters	Observed values	Normal values
TLC	7800/µL	4800-10800/µL
Hb	14.6 g/dL	12-17g/dL
RBC count	4.58 Million	4.4-6 Million
Platelet count	1.25 Lakh/µL	1.5-4.5 Lakh/µL
Sodium	137mmol/L	135-145mmol/L
Potassium	4.17 mmol/L	3.5-5.3 mmol/L
Magnesium	2.53mg/dL	1.6-2.4 mg/dL
Creatinine	1.32 mg/dL	0. 6-1.3 mg/Dl
Uric acid	19.4 mg/dL	2.5-7 mg/dL
Calcium	7.92 mg/dL	8.7-10.7 mg/dL
CRP	90.6 mg/L	0-10 mg/L
Urea	27.1 mg/dL	17-49 mg/dL

DISCUSSION:

Torsemide belongs to the pyridine sulfonylurea class of loop diuretics widely used in treating edema due to heart failure, chronic renal disease, hepatic cirrhosis[4] . Its primary site of activity is the thick ascending limb of the loop of Henle and distal collecting tubule, where it causes excretion of NaCl and water by inhibiting sodium and chloride reabsorption resulting in diuresis. This effect is caused by blocking the chloride- binding site of the Na+/k+/Cl- co transport mechanisms[5] .

Torsemide is available in IV and oral forms. The recommended initial oral dosages of torsemide are 10-20 mg/d for CHF, 20 mg/d for chronic renal failure, 5mg/d for HTN and 5-10 mg (in combination with a K sparing diuretic) for hepatic cirrhosis. Although torsemide does not offer major advantage over other loop diuretics, it may be benefit in patients who do not respond to or cannot tolerate other agents[3]. Recent studies on uric acid transporter revealed that multidrug resistance associated protein 4 (MRP4), sodium dependent phosphate transport protein 4 (NPT4) and organic anion transporters (OATs) are involved in the diuretics induced hyperurcemia. Torsemide and its metabolites did not interact with human URAT1, competitive inhibition of the basolateral OAT for uric acid may reduce tubular secretion. Because hOAT4 can reabsorb uric acid from the urinary lumen, increased uric acid reabsorb may occur as exchange for the secretion of torsemide and its metabolites[6]. It has been noted that hyperuricemia in loop diuretics occurs when diuretics produce sufficient salt and water loss as to result in volume contraction; this stimulates solute reabsorption at the proximal tubule. Another mechanism is volume contraction induced by thiazide type diuretics leading to increased H^+ secretion in the proximal tubule via the apically located NHE3. Consequently, cell pH increases, which in turn drives urate uptake via OAT4 as a result of increased urate/OH^- exchange[7].

CONCLUSION:

This case study highlights the indiscriminate self-administration of Torsemide 10 mg daily resulting in high levels of serum uric acid (19.4mg/dl) without classical symptoms of gouty arthritis. High levels of uric acid in the blood can cause crystals of uric acid being deposited leading to gout and it may eventually lead to permanent bone, joint and tissue damage and elevated uric acid levels are risk factors for heart disease and malignancy. This report represents the first documented case of drug induced hyperuricemia related to Torsemide use. Hence it is advisable to regularly check uric acid levels of patients who are prescribed Torsemide for prolonged periods.

LIST OF ABBREVATIONS

SL NO	ABBREVATIONS	EXPANSIONS
01.	OPD	Out Patient Department
02.	BP	Blood Pressure
03.	PR	Pulse Rate
04.	JVP	Jugular Venous Pressure
05.	CNS	Central Nervous System
06.	RS	Respiratory System
07.	CVS	Cardiovascular System
08.	Sr	Serum
09.	IV	Intra Venous
10.	CHF	Congestive Heart Failure
11.	HTN	Hypertension
12.	URAT1	Urate Transporter
13.	NHE3	Sodium/Hydrogen Exchanger 3

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