ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 05 | May - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

INCIDENCE OF HYPERKALEMIA IN PATIENTS TAKING TELMISARTAN

Medicine

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ABSTRACT

Over the past decades many advances have taken place in management of heart failure,diabetic nephropathy ,hypertension and CKD.Angiotensin 2 receptor blockers are used in patients intolerant to ACE-inhibitors .Telmisartan is one of the common ARBs used in our country sometimes their use is complicated by hyperkalemia.The present study was conducted with the objective of assessing the status of hyperkalemia in patients taking telmisartan and evaluate the progression of hyperkalemia.A cross sectional study was carried out among 100 patients aged 40 to 70 year old taking Telmisartan for more than 6 months presenting at Sarswathi institute of medical sciences, Hapur. Serum potassium was measured Patients with CKD,liver cirrhosis,heart failure or on diuretics were not included. In patients taking Telmisartan which are one of the common prescribed anthypertensive drug patients may develop asymptomatic hyperkalemia. Few pateints can develop mild symptoms.Such individuals should be routinely screened for serum potassium levels for timely interventions and management.

KEYWORDS

Background:
Potassium is the most abundant ion in the body (50-75 mmol/kg body weight). About 98% of potassium is located within the cells (~140 mmol/L), while only 2% is in the extracellular fluid (3.8-5.0 mmol/L). This potassium gradient plays a key role in maintaining the potential difference across cell membranes and determines cellular excitability and skeletal, cardiac, and smooth muscle cell contraction. On a normal diet the potassium intake is 80-100 mEq/day.

About 90% of normal potassium intake (80-100 mmol/day) is passively absorbed in the small intestine and several factors (insulin, aldosterone, β2-adrenergic stimulation, acid-base balance) promote its rapid cellular uptake through the Na^+,K^+-ATPase preventing hyperkalemia.

Additionally, an increase in plasma potassium levels (P_K) stimulates renin release from the renal juxtaglomerular cells and activates the renin-angiotensin-aldosterone system (RAAS), and aldosterone increases potassium excretion acting on the distal tubules and collecting ducts of the nephron, further lowering the P_K .

Hyperkalemia represents a most important acute electrolyte abnormality due to its potential for causing life-threatening arrhythmias. Hyperkalemia remains a vexing and challenging problem for clinicians, particularly in the management of patients with chronic kidney disease (CKD) and cardiovascular disease, especially congestive heart failure (CHF) .

Evidence points towards the possible complications that may arise due to ACE inhibitor or ARB use, however, these two categories are one of the most widely used drugs as a modality for RAAS. Further, the evidence towards hyperkalemia and its complications in Indian population is scarce, therefore, it is unclear that asymptomatic hyperkalemia should be treated or not in patients using ACE inhibitors and/or ARB (Telmisartan)users, hence the need for this study.

OBJECTIVE
To determine the incidence of hyperkalemia in patients taking ARBs.

MATERIAL AND METHODS
A total of 100 individuals attending General Medicine OPD in hospital and taking ARB (Telmisartan) for a minimum period of 06 months were selected for the study. In the present research, blood sample was collected for serum potassium estimation, and incidence of Hyperkalemia (Serum potassium value of more than 5.5 mEq/litre) was observed and analysed.

Exclusion Criteria:
Cases with the following findings were excluded:
1. Patients in whom reliability of drug consumption is not guaranteed
2. Patients whose renal function is known to be abnormal. (eGFR <60)
3. Patients who have disease condition such as liver cirrhosis or congestive heart failure; who are in clinically fluid overloaded state or are being treated for such a condition
4. Patients on concomitant therapy with thiazide diuretics or potassium sparing diuretics or any other drug known to affect electrolyte or potassium levels in blood
5. Patients with bleeding disorders
6. Patients not willing to consent for the study
7. Immunocompromised patients

RESULTS

Figure 1: Age wise distribution of study subjects

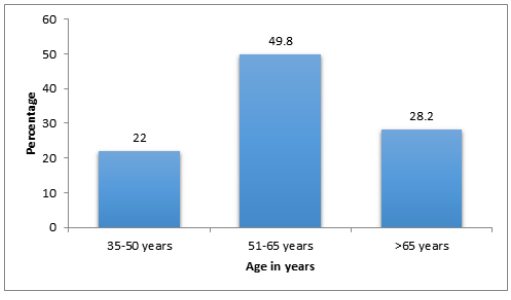


Figure 2: Gender distribution among study sample

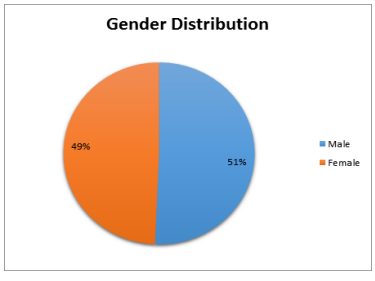


Figure 3: Serum potassium levels among study participants:

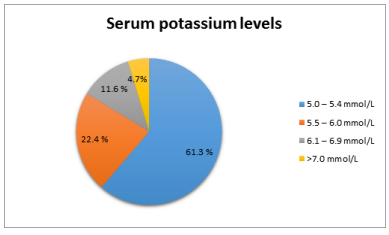
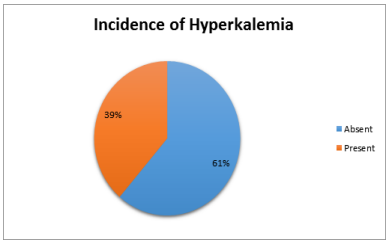


Figure 4: Serum potassium levels among study participants:



It was observed that out of 100 patients taking Telmisartan who participated in the study 61% developed no change out of left 39 % 61.3 % develop asymptomatic hyperkalemia with no changes in ECG and no clinical symptoms. 22.4% pateints develop episodic weakness and numbness with no ECG changes. Incidence was found to be much more common in females than males.11% develop generalized weakness with myalgia and 4.7 % develop hyperkalemia with T wave changes in ECG.

Limitations. First is the fact that it was observational in nature and it cannot provide any information on the time frame of development of hyperkalemia after the start of ARBs. Second, it was limited to a single-centre population and may not be generalizable to other populations.

CONCLUSION

This hospital-based Observational, Prospective, and inferential study was carried out among100 individuals attending General Medicine OPD in hospital and taking ARB agents for a minimum period of 06 months. Their blood sample was collected for serum potassium estimation, and incidence of Hyperkalemia.Patients having no condition such as liver cirrhosis or congestive heart failure; who are in clinically fluid overloaded state or are being treated for such a condition; not on any drug known to affect electrolyte or potassium levels in blood; doesn't have bleeding disorders; and are not immunocompromised were included in the study.Mild hyperkalemia (serum potassium 5.5 to 6 mmol/L), is the most common form of hyperkalemia observed in our study, followed by moderate hyperkalemia (potassium >6 to 6.9 mmol/L), and severe hyperkalemia (potassium >7 mmol/L). Such higher forms of hyperkalemia has been reported to present with life-threatening complications, but can also go unrecognized with few symptoms prior to cardiac arrest.It is agreeable that use of ARBs is associated with a high prevalence of hyperkalemia. Most patients can and should benefit from the beneficial effects of these agents, but caution should be exercised especially in those with hypertension, chronic kidney disease, and diabetes mellitus. ARBs should be discontinued once serum potassium exceeds 5.5 mEq/L, unless it can be controlled with diet, diuretics or sodium polystyrene sulfonate. As recommended, checking serum potassium level routinely is advised after any change in ARB dosing.

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