

The paradox of spironolactone: A heart failure treatment with potentially harmful effects

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Madam, Heart failure (HF) is a multifaceted clinical syndrome arising from a functional or structural cardiac condition that hampers the adequate filling or expulsion of blood into the systemic circulation. It is estimated that heart failure affects around 26 million people globally and significantly adds to healthcare expenditures on a worldwide scale¹. Furthermore, in 2016, approximately 16 percent of deaths in Pakistan were due to heart related disorders. This number grew to 29 percent in 2022². HF can greatly diminish the functional capability of a patient and heighten the risk of mortality. Therefore, it is essential to accurately diagnose and proficiently manage this condition to improve the quality of life of the patient.

Spironolactone, the first mineralocorticoid receptor antagonist (MRA) to be developed, is prescribed for the management of hypertension, primary hyperaldosteronism, and peripheral oedema linked to cardiac failure³. When HF occurs and cardiac output decreases, it stimulates the renin-angiotensin-aldosterone system (RAAS) which in turn causes salt and water reabsorption and thus increases venous return to the heart which further contributes to congestive heart failure and heart fails to pump the additional fluid and pooling occurs. Here MRAs are very affective as they inhibit the function of aldosterone and hence fluid retention does not occur.

Unfortunately, the beneficial effects of spironolactone do not occur without substantial adverse effects. Firstly, spironolactone is associated with sexual adverse events due to its affinity for androgen and progesterone

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receptors. There have been reports of male patients experiencing gynecomastia and breast pain. Secondly, spironolactone has been classified as potassium sparing diuretic hence hyperkalaemia (defined as serum K⁺ > 5.5 mEq/L) is a common side effect³. Hyperkalaemia can manifest as muscle weakness or paralysis, metabolic acidosis, cardiac conduction abnormalities, and life-threatening cardiac arrhythmias⁴. These cardiac arrhythmias can have serious consequences, including cardiac arrest and stroke.

In conclusion heart failure, if not treated immediately, can be fatal. Spironolactone is a drug used for management of heart failure; however, it has some detrimental effects on the cardiovascular system such as development of serious cardiac arrhythmias. Hyperkalaemia, due to potassium sparing nature of MRAs, is the primary cause of these life-threatening effects thus it is recommended to assess serum potassium levels and renal function of a patient with heart failure before prescribing spironolactone. Moreover, patients who are being treated with spironolactone should be periodically monitored to prevent any casualty.

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Author's Contributions

MR: Literature search, drafting and approved final version.

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