



A CASE REPORT ON – FUROSEMIDE INDUCED ACUTE KIDNEY INJURY

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ABSTRACT: Furosemide is a loop diuretic medication used to treat fluid build-up due to Heart failure, liver scarring or Kidney disease. It may also be used for the treatment of High Blood Pressure. It can be taken by injection into a vein or by mouth. When taken by mouth, it typically begins working within an hour, while intravenously it typically begins working within five minutes. It is often viewed as a first line agent in most people with edema caused by Congestive Heart Failure because of its Anti-Vasoconstrictor and Diuretic effects. It can also cause kidney damage; this is mainly by loss of excessive fluid (i.e. dehydration) and is usually reversible. Furosemide is a type of loop diuretic that works by decreasing the reabsorption of water by kidneys. Furosemide is also used for liver cirrhosis, kidney impairment, in adjunct therapy for swelling of the lungs where rapid diuresis is required (IV injection) and in the management of severe hypercalcemia in combination with adequate rehydration.

We present a case report of a 47 years old male, admitted in the hospital in ICU with complaints of Dyspnea, orthopnea, and decreased sleep. The patient also had a complaint of chest pain and abdomen fullness with pain. The Patient was diagnosed with Coronary Artery Disease. He was treated with Diuretics (furosemide) after which he was diagnosed with Acute Kidney Injury. From this case study it can be concluded that long term usage of diuretics or diuretics prescribed at higher dosages may lead to permanent kidney damage.

KEY WORDS: Furosemide, Loop diuretic, Congestive Heart Failure, Anti-Vasoconstrictor, Live Cirrhosis, Hypercalcemia, Dyspnea, Orthopnea, Coronary Artery Disease, Acute Kidney Injury.

INTRODUCTION: FUROSEMIDE is a loop diuretic. It's used to treat high blood pressure (Hypertension), heart failure and a build-up of fluid in the body (edema). Furosemide sometimes comes mixed with other diuretics, including with: Amiloride (called co-amilofruse, Frumil or Frumil LS), spironolactone (called Lasilactone), triamterene (called Frusen). Furosemide is usually taken once a day in the morning, some people take it twice in day. Furosemide is an anthranilic acid derivative; it is a rapid acting highly efficacious diuretic. It is marked as a loop diuretic because of its high ceiling function. It causes inhibition of sodium - potassium - 2 chloride co - transporter (symporter). It is located on the thick ascending limb of the loop of Henle in the renal tubule. This drug decreases the reabsorption of sodium, potassium and chloride ions from the tubule. It causes increased urinary excretion of these ions and water from the body thereby reducing the blood pressure and load on the heart. Here we report a case of Furosemide induced AKI and also discuss the appropriate clinical

presentation and management. As the occurrence of this effect is uncommon, our goal is to increase awareness of this adverse event.

CAUSES: Most cases of AKI are caused by reduced blood flow to the kidneys, usually in someone who's already unwell with another health condition

This reduced blood flow could be caused by:

- Low blood volume after bleeding, excessive vomiting or diarrhea, or severe dehydration
- The heart pumping out less blood than normal as a result of heart failure, liver failure or sepsis
- Certain medicines that reduce blood pressure or blood flow to the kidneys, such as ACE inhibitors, certain diuretics or NSAIDs.
- AKI can also be caused by a problem with the kidney itself, such as inflammation of the filters in the kidney (glomerulonephritis), the blood vessels (vasculitis) or the other structures in the kidney.

RISK FACTORS: Acute Kidney Failure almost always occurs in connection with another medical condition or event. Conditions that can increase your risk of acute kidney failure include:

- Being hospitalized, especially for a serious condition that requires intensive care:
- Advanced age
- Blockages in the blood vessels in arms or legs (peripheral artery disease)
- Diabetes
- High Blood Pressure
- Heart Failure
- Kidney disease
- Liver disease
- Certain cancers and their treatment

SIGNS AND SYMPTOMS: Furosemide is a strong diuretic ('water pill') and may cause dehydration and electrolyte imbalance.

Other symptoms: Dry mouth, thirst, nausea, vomiting, weakness, drowsiness, confusion, muscle pain, or cramps, rapid or irregular heartbeat

CASE REPORT: A 47 year old male patient was admitted in the hospital with chief complaints of Dyspnea, Orthopnea, Decreased sleep, and chest pain since 3 days. He also had a complaint of Abdomen fullness with pain. The patient was conscious \ coherent \ afebrile during admission. The patient was diagnosed with Coronary Artery Disease, he was treated with Diuretics (furosemide) after which he developed Acute Kidney Injury. Upon renal examination it was found that his blood urea and creatinine levels were elevated. In order to manage CAD he was treated with furosemide (Lasix). Subsequently the dose of furosemide was reduced in consideration with AKI.

DISCUSSION: Furosemide is a medicine which is intended to affect kidney function. It inhibits the kidney from conserving water and salt. So, the kidney allows more water and salt to escape into the urine.

Furosemide slows down the tubules function slightly so less fluid is reabsorbed, thereby increasing the urine volume. This reduces the work the tubules have to do, and reduces the concentration of toxins in the tubule, so may actually prevent damage to the kidneys in certain situation. When furosemide is used to treat severe heart

failure, high doses may be required to induce a state of dehydration. This reduces the amount of circulating blood volume and reduces blood pressure, blood flow to the kidneys is reduced and the filtration rate falls. Measures of kidney function are reduced, concentration of urea, creatine and toxins in the blood increase. Kidney function will recover if the furosemide dose is reduced (but the heart failure may get worse).

If the dehydration is extreme and prolong, the reduced blood flow to the kidneys can result in permanent kidney damage. It is not the furosemide causing the damage directly. If the heart failure is very severe you may have to choose which is more important, heart failure or kidney function. The dose of furosemide may need adjusting frequently to get the best results.

LIMITATIONS: In this case as the patient was diagnosed with CAD, the benefit of furosemide in treating CAD is greater than the effect of furosemide causing AKI. Hence the condition was managed by continuing the drug furosemide but with reduced doses.

CONCLUSION: From this case study it can be concluded that long term usage of diuretics or diuretics prescribed at higher dosages may lead to permanent Kidney damage.

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