

Uremic Pericarditis: As a Result of Chronic Kidney Diseases

Ramya R, A Felicia Chitra, Manjubala Dash*

Mother Theresa Post Graduate and Research Institute of Health Sciences, Pudcherry, India

*Corresponding Author: Manjubala Dash, Mother Theresa Post Graduate and Research Institute of Health Sciences, Pudcherry, India.

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Abstract

Uremic pericarditis is a main complication of kidney diseases. Sometimes this condition occur in patients with renal failures and also patient who underwent dialysis. Now a day clinically significant uremic pericarditis is rare due to the dialysis drug doses and also early initiation of dialysis. The main symptoms of uremic pericarditis are pain over the chest, fever and anxiety. This condition was prevented by creating awareness among dialysis patients and other risk factors and life style modifications.

Keywords: Uraemia; Pericarditis; BUN; Renal Disease; Effusion

Uremic pericarditis

Uremic pericarditis occurs when blood urea nitrogen (BUN) level increased in the body. It may be caused by some conditions such as renal failure, heart attack, severe dehydration and many other factors [1].

The causes of uremic pericarditis

The definite cause of Uremic Pericarditis is unknown.

- This condition occurs when the blood urea nitrogen levels in the body more than 60 mg/dL (Normal range: 7 - 20 mg/dL)
- These Increased Blood urea nitrogen levels may be due to the result of some disorders which will affecting the kidney functions, such as, acute renal failure, Renal calculi, tumours, and polycystic kidney disease and also Conditions which will affect the prostate (or) urinary tract.
- The other main causes are Heart attack, Severe dehydration, burns
- Uremic Pericarditis may also occur due to some of the infectious microorganisms such as a virus, bacteria, or fungus.
- In most of the cases, the cause of pericarditis unknown (idiopathic pericarditis) [2].

Dialysis-associated pericarditis

Pericarditis is sometimes seen in patients on maintenance haemodialysis or peritoneal dialysis.

Mainly there are two factors, which may contribute to this condition:

1. Inadequate dialysis of the patient
2. Fluid overload.

These two forms of uremic pericarditis in renal failure can be differentiated by the type (serous versus hemorrhagic) of effusion which is present in the body, but there is a significant overlap [1].

Patient with end stage renal failure

Patient with ESRD may develop pericardial disease, especially pericarditis and pericardial effusions, and occasionally chronic constrictive pericarditis. Recent Advances in pericarditis management have reduced the incidence of pericarditis among patient with renal failure, but this problem is still related to significant morbidity and rarely mortality [2].

Factors

There are so many factors, which will affect the patient condition. These are mainly related to uremia, Infections, systemic conditions, drugs and blood disorders.

Those factors are following:

- Delay to initiate dialysis or inadequate haemodialysis
- Retained uremic toxins
- Loss of residual renal function
- Viral and bacterial infections
- Tuberculosis
- Systemic lupus erythematosus
- Scleroderma
- Polyarteritis nodosa
- Wegner's granulomatosis
- Platelet dysfunction with intra pericardial bleeding
- Heparin
- Alpha methyl dopa
- Procainamide
- Minoxidil [3].

Types: There are mainly two types are there

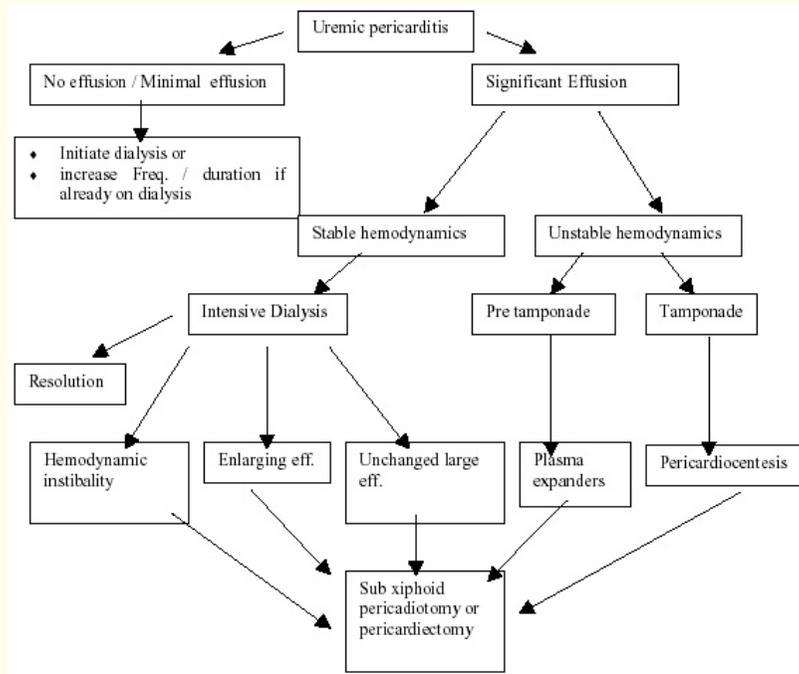
1. Uremic pericarditis: This condition occurs in patient with uraemia who has never received any dialysis.
2. Dialysis associated pericarditis: This condition occurs among dialysis patients:
 - Mainly Due to inadequate dialysis
 - Volume overload
 - Bacterial or viral infections

Pathology of uremic pericarditis: The normal BUN is above 60 mg/dL (normal is 7 - 20 mg/dL) [4].

- Fibrinous, aseptic inflammation (predominantly lymphocytic) is the hallmark of uremic pericarditis. This Distribution of inflammation can diffuse or localised with areas of adhesion between the parietal and visceral layers of pericardium.
- When the membranes get thicken, which will increase the vascularity and movement between the layers, blood vessels break causing formation of a serosanguinous effusion loculated between adherent fibrous bands.
- Uninfected uremic pericarditis is similar among other acute pericarditis in that the inflammatory cells do not penetrate the myocardium.

- It accounts for the customary absence of the typical stage one electro-cardiographic (ECG) changes, which depend on sub epicardial myocarditis.
- ECG with typical changes of acute pericarditis, intercurrent infection must be suspected.
- The volume of effusion, which may grow when the Inflammation is prolonged, fluid overload and use of heparin.
- Long term adhesive pericarditis with intermittent haemorrhage predisposes to sub-acute constrictive pericarditis [5].

Approach to pericarditis in chronic renal failure [5]



Figure

Clinical manifestations of uremic pericarditis:

The main signs and symptoms are:

- Slow Heart rate with tamponade.
- Low grade Fever and hypotension due to autonomic impairment.
- Symptoms of Neoplastic pericarditis, it may develop within a days to weeks.
- The next more common symptom is breathing difficulty.
- Profuse Sweating.
- Pain over the chest, It may increase while coughing/swallowing.
- Dry cough.
- Fatigue, Fear [6].

Diagnostic tests: A diagnostic tests for Uremic Pericarditis are:

- Detailed medical history.
- A complete physical examination.
- If signs and symptoms are appear, the healthcare member may need a full medical history to compare the condition and find out other possible causes of uremic pericarditis.
- While listening the patient heartbeat, if a faint sound is heard, it is of concern for the healthcare member.

Other necessary tests may include:

- Blood urea nitrogen level (BUN)
- Blood test
- Blood culture to determine the causative organism
- Chest X- ray
- CT & MRI scan
- Echocardiogram

The radiology imaging tests sometimes show the presence of abnormal fluid levels around the heart, within the pericardial sac.

- Sometimes, depending on the clinical condition, abnormal fluid in the pericardial sac may be cultured, mainly to determine the infectious cause
- Pericardiocentesis [7].

ECG features of uremic pericarditis

The ECG shows that classical ST elevation (concavity upwards) instead the hyperkalemia features dominate, if present.

ST elevation is mainly due to the relative lack of pericardial electrical injury. Further, the fluid consists of oppositely charged uremic molecules which neutralises the electrical gradient [3].

Treatment for uremic pericarditis: The main aim of treatment is to bring down the BUN score to near normal range.

- Dialysis help to bring down the blood urea nitrogen levels.

Some of the medications used to relieve pain such as:

- Analgesics (It will relieve pain).
- Anti-inflammatory medication (It will decrease inflammation).
- Complete bed rest.
- Pericardiocentesis - When there is a severe build-up of fluid, a small cut is made into the pericardium, it allow drainage of the fluid.
- Diuretics – It helps to decrease excess fluid accumulation in the body.
- For recurrent pericarditis (arising from acute pericarditis) - colchicines medication [8].

Cardiovascular complications of uraemia and dialysis:

- Cardiovascular complications arise frequently in patients with renal disorders.
- Cardiovascular disorders are the leading cause of death in the people with end-stage renal failure on chronic dialysis Prevention and treatment of cardiovascular disorders is therefore of major importance in these patients [9].

Possible complications of uremic pericarditis:

- Constrictive pericarditis: it is a condition where the heart function is restricted, due to compression by the surrounding pericardial sac.
- Swelling of the lungs.
- Cardiac tamponade (accumulation of excess fluid).
- Shock.
- Recurrent pericarditis.
- Chronic pericarditis [10].

Uremic pericarditis prevention: A few preventative tips for Uremic Pericarditis Which include:

- Proper and effective treatment of some conditions, especially conditions which affect the kidney.
- The patient may need life style modifications and rest [10].

Conclusion

Uremic Pericarditis, in most cases is caused by the spread of illness to the pericardium. The early treatment of an illness will decrease the chances of developing pericarditis. Acute pericarditis if diagnosed early can be effectively treated with bed rest and NSAID. If not diagnosed early can cause many complications and even death, it is therefore imperative for the paramedic to diagnose pericarditis or suspect it in patients who are ill with viral, bacterial and fungal infections.

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