Universe International Journal of Interdisciplinary Research
(Peer Reviewed Refereed Journal)

© UIJIR | ISSN (O) – 2582-6417
JUNE 2022 | Vol. 3 Issue 1
www.uijir.com

COMPREHENSIVE REVIEW ON DIAGNOSIS AND MANAGEMENT OF NEPHROTIC SYNDROME

Author's Name: Rahul Bisht

Affiliation: Simulation Specialist, Vidyanta Skill Institute Pvt. Ltd., Gurugram, Haryana, India

E-Mail: bishtrahul572@gmail.com

DOI No. – **08.2020-25662434**

Abstract

Manifestation of glomerular disease, characterized by nephrotic range proteinuria and a triad of clinical findings associated with large urinary losses of protein: hypoalbuminemia, edema and hyperlipidemia sometimes accompanied by hematuria, hypertension and reduced glomerular filtration rate. Treatment is directed at the underlying cause. Other efforts include managing high blood pressure, high blood cholesterol, and infection risk. A low salt diet and limiting fluids is often recommended. About 5 per 100,000 people are affected per year. The usual underlying cause varies between children and adults.

Keywords*: Glomerular disease, Nephrotic range, Hypoalbuminemia, edema, Hyperlipidemia*

INTRODUCTION

Nephrotic syndrome is not a disease but a cluster of clinical findings peripheral edema, heavy proteinuria, and hypoalbuminemia, often with hyperlipidemia. Patients typically present with edema and fatigue, without evidence of heart failure or severe liver disease. The diagnosis of NS is based on typical clinical features with confirmation of heavy proteinuria and hypoalbuminemia. The patient history and selected diagnostic studies rule out important secondary causes, including diabetes mellitus, systemic lupus erythematosus, and medication adverse effects. Most cases of Nephrotic syndrome are considered idiopathic or primary; membranous nephropathy and focal segmental glomerulosclerosis are the most common histologic subtypes of primary Nephrotic Syndrome in adults. Important complications of Nephrotic Syndrome include venous thrombosis and hyperlipidemia; other potential complications include infection and acute kidney injury. Spontaneous acute kidney injury from NS is rare but can occur as a result of the underlying medical problem. Despite a lack of evidence-based guidelines, treatment consisting of sodium restriction, fluid restriction, loop diuretics, angiotensin-converting enzyme inhibitor or angiotensin receptor blocker therapy, and careful assessment for possible disease complications is appropriate for most patients. Renal biopsy is often recommended, although it may be most useful in patients with suspected underlying systemic lupus erythematosus or other renal disorders, in whom biopsy can guide management and prognosis. Immunosuppressive treatment, including corticosteroids, is often used for NS, although evidence is lacking. Routine prophylactic treatment to prevent infection or thrombosis is not recommended. A nephrologist should be consulted about use of anticoagulation and immunosuppressants, need for renal biopsy, and for other areas of uncertainty.[1]

© UIJIR | ISSN (O) – 2582-6417
JUNE 2022 | Vol. 3 Issue 1
www.uijir.com

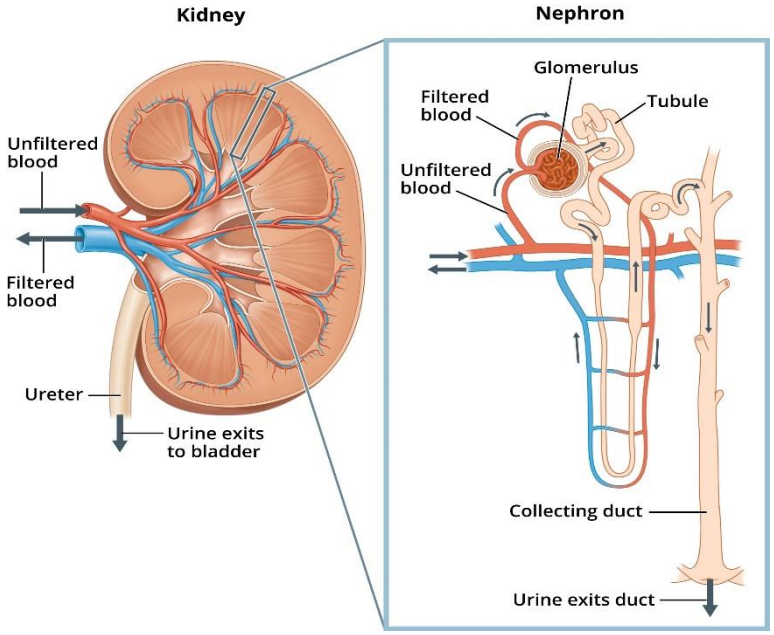


Fig. 1 As blood passes through healthy kidneys, the glomeruli filter out waste products and allow the blood to keep the cells and proteins the body needs.[2]

INCIDENCE OF NEPHROTIC SYNDROME IN INDIA AMONG ADULTS

Nephrotic syndrome has an incidence of three new cases per 100 000 each year in adults.[3] It is a relatively rare way for kidney disease to manifest compared with reduced kidney function or microalbuminuria as a complication of systemic diseases, such as diabetes and raised blood pressure.[4]

CAUSES OF NEPHROTIC SYNDROME

A wide range of primary (idiopathic) glomerular diseases and secondary diseases can cause the syndrome.

1. **Primary (idiopathic) glomerular disease**

Most of the cases of nephrotic syndrome are usually caused by primary glomerular diseases. Thirty years ago, idiopathic membranous nephropathy was the most common primary cause of the syndrome.[5] The incidence of other glomerular diseases, particularly focal segmental glomerulosclerosis, has increased and pronounced racial differences. Membranous nephropathy remains the most common cause in white patients, whereas focal segmental glomerulosclerosis is the most common cause in black patients (50-57% of cases)[6]

2. **Secondary glomerular disease**

Diabetic nephropathy is a common cause, reflecting the increasing prevalence of diabetes. Amyloid is also an important cause, with immunoglobulin light chain amyloid nephropathy accounting for 10% of cases in one series[5]

Secondary causes of nephrotic syndrome

1. **Other disease**

- Diabetes mellitus
- Systemic lupus erythematous
- Amyloidosis

2. **Cancer**

- Myeloma and lymphoma

3. Drugs

- Antimicrobial agents
- NSAID
- Captopril
- Lithium

4. Infections

- HIV
- Hepatitis B and C
- Malaria
- Syphilis
- Mycoplasma

5. Congenital causes

- Alport's syndrome
- Congenital nephrotic syndrome of the Finnish type
- Pierson's syndrome
- Nail-patella syndrome

CLINICAL SIGNS ACCOMPANY NEPHROTIC SYNDROME

There are four main signs or symptoms that make up nephrotic syndrome. They are:

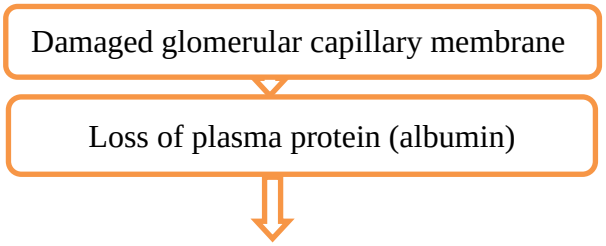
- Too much protein in the urine(proteinuria)
- High fat and cholesterol levels in the blood. The medical term for it is "hyperlipidemia."
- Swelling of legs, feet and ankles, and sometimes in hands and face. This is called edema.
- Low levels of albumin in the blood. (Hypoalbuminemia)

A few other characteristics seen in nephrotic syndrome are:

The most common sign is excess fluid in the body due to serum hypoalbuminemia. Lower serum oncotic pressure causes fluid to accumulate in the interstitial tissues. Sodium and water retention aggravate the edema. This may take several forms Puffiness around the eyes, characteristically in the morning.

- Pitting edema over the legs.
- Fluid in the pleural cavity causing pleural effusion. More commonly associated with excess fluid is pulmonary edema.
- Fluid in the peritoneal cavity causing ascites.
- Generalized edema throughout the body known as anasarca.[7]

PATHOPHYSIOLOGY OF NEPHROTIC SYNDROME



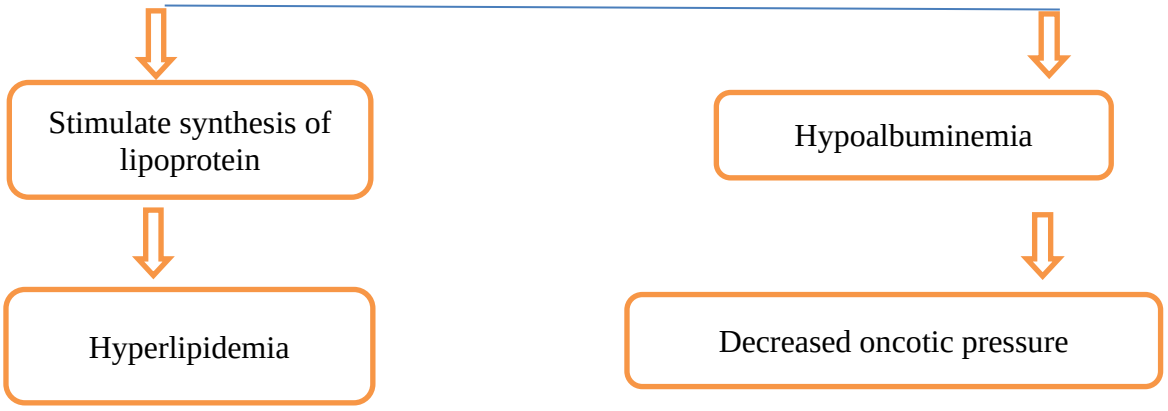


Diagram showing pathophysiology of Nephrotic syndrome[8]

COMPLICATIONS OF NEPHROTIC SYNDROME

Possible complications of nephrotic syndrome include:

- **Blood clots.** The inability of the glomeruli to filter blood properly can lead to loss of blood proteins that help prevent clotting. This increases the risk of developing a blood clot in the veins.
- **High blood cholesterol and elevated blood triglycerides.** When the level of the protein albumin in blood falls, liver makes more albumin. At the same time, liver releases more cholesterol and triglycerides.
- **Poor nutrition.** Loss of too much blood protein can result in malnutrition. This can lead to weight loss, which can be masked by edema. Patient may also have too few red blood cells (anaemia), low blood protein levels and low levels of vitamin D.
- **High blood pressure.** Damage to the glomeruli and the resulting build-up of excess body fluid can raise the blood pressure.
- **Acute kidney injury.** If kidneys lose their ability to filter blood due to damage to the glomeruli, waste products can build up quickly in the blood. If this happens, patient might need emergency dialysis — an artificial means of removing extra fluids and waste from the blood — typically with an artificial kidney machine (dialyzer).
- **Chronic kidney disease.** Nephrotic syndrome can cause the kidneys to lose their function over time. If kidney function falls low enough, patient might need dialysis or a kidney transplant.
- **Infections.** People with nephrotic syndrome have an increased risk of infections.[9]

DIAGNSOTIC EVALUATION FOR NEPHROTIC SYNDROME

- Urine analysis for proteins, casts and specific gravity.
- Blood for total serum protein and albumin and globulin levels.
- Erythrocyte sedimentation rate.
- Serum cholesterol.
- Immunoglobulin
- Electrophoresis
- Renal Ultra Sound
- Renal Biopsy in Adult[8]

MANAGEMENT OF NEPHROTIC SYNDROME

- **Blood pressure medications.** Drugs called angiotensin-converting enzyme (ACE) inhibitors reduce blood pressure and the amount of protein released in urine. Medications in this category include lisinopril (Prinivil, Qbrelis, Zestril), benazepril (Lotensin), captopril and enalapril (Vasotec).
- **Water pills (diuretics).** These help control swelling by increasing kidneys' fluid output. Diuretic medications typically include furosemide (Lasix). Others include spironolactone (Aldactone, Carospir) and thiazides, such as hydrochlorothiazide or metolazone (Zaroxolyn).
- **Cholesterol-reducing medications.** Statins can help lower cholesterol levels. However, it's not clear whether cholesterol-lowering medications can improve the outcomes for people with nephrotic syndrome, such as avoiding heart attacks or decreasing the risk of early death.
- **Blood thinners (anticoagulants).** These might be prescribed to decrease the blood's ability to clot, especially if patient had a blood clot. Anticoagulants include heparin, warfarin (Coumadin, Jantoven), dabigatran (Pradaxa), apixaban (Eliquis) and rivaroxaban (Xarelto).
- **Immune system-suppressing medications.** Medications to control the immune system, such as corticosteroids, can decrease the inflammation that accompanies some of the conditions that can cause nephrotic syndrome. Medications include rituximab (Rituxan), cyclosporine and cyclophosphamide.[10]

NEPHROTIC SYNDROME CONSERVATIVE MANAGEMENT

1. Monitor urine output and urine examination
2. Blood pressure monitoring
3. Fluid and electrolyte balance
4. Weight

NURSING CARE OF NEPHROTIC SYNDROME

- Assess the vital signs, Blood pressure and monitor them frequently.
- Maintain fluid balance and the requirement is calculated according to the output and weight of the child.
- Record the daily weight and it would be compared with oedema and output which should be done daily.
- Daily urine examination is done for specific gravity and albumin.
- Measure the abdominal girth daily to assess the oedema.
- The diet should be low in sodium and high in proteins.
- The Dyspnoea due to ascites is relieved by sitting position and abdominal paracentesis to relieve upward pressure on the diaphragm.
- Proteins may be given 4 to 5 g / kg of body weight according to serum protein levels and tolerance of the patient.
- Adequate calories should be supplied. Feeds may be small & frequent.
- Encourage the patient in Fowler's position to decrease pressure against diaphragm, as the patient has respiratory difficulty caused by ascites.

- Care of the oedematous skin must be done by positioning and by giving skin care and cleaning and keeping the skin dry.
- Encourage for divisional activities that provide satisfaction.[11]

REFERENCES

1. CHARLES KODNER, MD, University of Louisville School of Medicine, Louisville, Kentucky Diagnosis and Management of Nephrotic Syndrome in Adults, Mar 15, 2016 Issue
2. https://www.niddk.nih.gov/-/media/Images/Health-Information/Urologic/Kidney-Nephron-FINAL_2044x1890.jpg
3. Llach F. Thromboembolic complications in the nephrotic syndrome. Coagulation abnormalities, renal vein thrombosis and other conditions. Postgrad Med 1984;76:111-4, 116-8, 121-3
4. National Collaborating Centre for Chronic Conditions. Chronic kidney disease: early identification and management of adults with chronic kidney disease in primary and secondary care. Draft for consultation: full guideline published 10 March 2008. www.nice.org.uk/nicemedia/pdf/CKDConsFullGuideline.pdf
5. Haas M, Meehan SM, Karrison TG, Spargo BH. Changing etiologies of unexplained adult nephrotic syndrome: a comparison of renal biopsy findings from 1976-1979 and 1995-1997. Am J Kidney Dis 1997;30:621-31.
6. Korbet SM, Genchi RM, Borok RZ, Schwartz MM. The racial prevalence of glomerular lesions in nephrotic adults. Am J Kidney Dis 1996;27:647-51
7. Freedberg, Irwin M.; et al., eds. (2003). Fitzpatrick's dermatology in general medicine (6th ed.). New York, NY [u.a.]: McGraw-Hill. p. 659. ISBN 0-07-138076-0.
8. https://www.atozgoogle.com/nephrotic-syndrome/
9. https://www.mayoclinic.org/diseases-conditions/nephrotic-syndrome/symptoms-causes/syc20375608#:~:text=Nephrotic%20syndrome%20is%20a%20kidney,excess%20water%20from%20your%20blood.
10. Nephrotic syndrome in adults. National Institute of Diabetes and Digestive and Kidney Diseases. https://www.niddk.nih.gov/health-information/kidney-disease/nephrotic-syndrome-adults. Accessed Nov. 22, 2019.
11. https://www.atozgoogle.com/nephrotic-syndrome/