# Nephrotic syndrome

## *Executive summary*

## Introduction

## Nephrotic syndrome (NS) is a clinical disorder characterized by the presence of massive proteinuria, hypoalbuminaemia and oedema. It may be idiopathic or secondary. A secondary cause must be sought for before commencement of treatment .

## Idiopathic NS: The cause is usually unknown but histologic findings include minimal change disease (MCD), membranous nephropathy (MN) and focal segmental glomerulosclerosis (FSGS). These are very common in children and responsive to steroid therapy . They may also be seen in adults.

## Secondary NS: These may have similar histologic features as idiopathic NS but are due to known causes such as viral infections e.g. HIV, HBV and HCV , non-communicable diseases such as diabetes mellitus, multiple myeloma and amyloidosis; and auto-immune disorders such as systemic lupus erythematosus. Secondary NS makes up a small fraction of NS and requires treatment of the underlying cause.

### Target users

* Doctors

### Target area of use

* Ward
* Outpatient department

### Key areas of focus / New additions / Changes

This guideline focuses on the diagnosis and treatment of idiopathic nephrotic syndrome in adults and children. Treatment of secondary nephrotic syndrome requires treatment of the underlying cause. These can be found in the related specific guideline .

Treatment of nephrotic syndrome may take up to 3 months in children and 7 months in adults.

### Limitations

Cases of relapse and steroid resistance require referral to nephrologist

## Presenting symptoms and signs

These include:

* Passage of frothy urine
* Leg swelling
* Facial swelling
* Abdominal swelling
* Breathlessness
* Dizziness
* Reduction in urine output

### Important warning features :

These findings may indicate a diagnosis other than NS :

* Macroscopic haematuria – coke-colored urine or blood in urine
* Elevated blood pressure
* Jaundice
* Paroxysmal nocturnal dyspnea
* Raised jugular venous pressure

**Diagnosis**

Diagnosis of NS is made when the following are present:

1. Oedema
2. Urine dipstick showing 3-4+ protein OR urine protein/creatinine ratio ≥ 2 g/g OR protein in 24-hour urine of ≥ 3.0 g
3. Hypoalbuminaemia (< 25 g/L).

Hyperlipidaemia (high LDL cholesterol levels) may be present but is not necessary for diagnosis. In view of this, there is no indication to check the lipid profile.

## Examination findings

The most common examination findings include

* Peripheral oedema
* Periorbital oedema
* Ascites

**Investigations**

* Urine dipstick
* Early morning urine protein/creatinine ratio
* Serum creatinine
* Serum albumin
* Serum lipid profile
* Plain chest X-ray
* FBC
* Renal biopsy

Other tests to rule out secondary causes of NS:

* HIV Serology
* Hepatitis serology
* Serum or urine protein electrophoresis
* Blood glucose

## Management

### For children with NS

* Admit child with first presentation of NS.
* Oedema: Reduce salt intake and maintain strict fluid balance. If oedema is symptomatic there may be need to give IV frusemide 1 mg/kg OD (not more than 40 mg per dose).
* Prophylaxis against complications:
  + Infections: Oral penicillin V at 125 mg BD if under 5 years, or 250 mg BD if over 5 years. This should continue until oedema subsides. If the child is profoundly ill or appears to have sepsis use IV Ceftriaxone 50 mg/kg OD (max 2g)
  + Prednisolone - induced gastritis: Oral omeprazole 0.5 - 1.5 mg OD (max 40 mg OD )
* Immunosuppressive therapy: To induce remission, followed by a slow wean to reduce risk of relapse: Oral prednisolone 60 mg/m2/day or 2mg /kg (max 80 mg) OD for 4 weeks, then 40 mg/m2/alternate days (max 60 mg) for 4 weeks, then 20 mg/m2/alternate days for 10 days, then 10 mg/m2/on alternate days for 10 days, then 5 mg/m2/alternate days for 10 days, then cease.

### For adults with NS

* Oedema: Restrict dietary sodium to less than 3 g per day and fluid to less than 1,500 mL per day. Strict fluid balance.
* Treat oedema with loop diuretics – oral or IV – depending on degree of oedema. The aim is to reduce patient’s weight by 0.5-1 kg /day.
* Proteinuria: Give ACE inhibitors regardless of blood pressure. Start at low dose.
* There is no evidence to support the use of corticosteroids in adult NS. However, it is recommended based on histological reports. Patients with Idiopathic NS from MCD and FSGS may be placed on prednisolone 1 mg/kg/day (max 80 mg/day) for 4 weeks (or continued over 16 weeks) with treatment tapered off over 6 months.
* Treat secondary cause of NS if present.
* Anticoagulation, statin therapy and infection prophylaxis are not recommended for adults. However, treat infections, if they occur and provide prophylaxis for patients at high risk of thromboembolic events.
* Refer patients who still have proteinuria after treatment to nephrologist for expert management.

### Special issues and complications

**Remission** is present when the urine dipstick protein ≤ 1+ on 3 consecutive days after completion of treatment course.

**Relapse** is defined as the presence of oedema plus urine dipstick protein of ≥ 3+ for 3 consecutive days after remission. This requirements the re-commencement of steroid therapy.

**Steroid resistance** exists when urine dipstick protein ≥ 3+ for 3 consecutive days with oedema, after a 4-week course of treatment with steroids in adults and 3 month course in children.

In the case of relapse or steroid resistance, consider referring patient to nephrologist for specialist care.

Complications include hypovolaemia, infection and thrombosis and acute kidney injury.

## Key Issues for Nursing care

## While a patient is on admission the following should be done:

* Daily urine dipstick measurement
* Daily weighing
* Blood pressure monitoring
* Strict fluid balance chart.

## References

National Kidney Foundation. KDIGO clinical practice guideline for glomerulonephritis. Kidney Int Suppl. 2012(2)

Kodner C. Nephrotic syndrome in adults: diagnosis and management. American family physician. 2009 Nov 15;80(10).

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