Nephrotic Syndrome

Nephrotic syndrome is a group of symptoms including massive proteinuria defined as a daily loss of 3.5 gm or more of protein, hyperlipidemia, generalized edema, and hypoalbuminemia which results from renal pathology. Nephrotic syndrome is caused by several diseases including membranous glomerulonephritis, minimal change disease, and focal segmental glomerulosclerosis. Nephrotic syndrome is usually initially related to a derangement in the glomerular capillary walls that result in increased permeability to plasma proteins. Loss of protein leads to hypoalbuminemia beyond the compensatory rate of synthesis in the liver, which contributes to generalized edema due to decreased colloid osmotic pressure in the blood. Additionally, nephrotic syndromes are often characterized by immunodeficiency due to loss of immunoglobulins and thrombotic complications due to loss of anticoagulants like antithrombin, protein C and protein S in the urine.



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Signs and Symptoms

Massive Proteinuria > 3.5g per Day
Massive Protein-urinal on Top of (3) Tree with 0.5 tag
Massive proteinuria greater than 3.5g per day is the hallmark sign of nephrotic syndrome disease processes. Massive proteinuria is caused by derangement in the glomerular capillary walls that result in increased permeability to plasma proteins.

Edema
Edamame
Edema is swelling of the face, lower extremities, and hands due to loss of oncotic pressure in the blood due to lost protein.

Increased risk of infection
Viruses and Bacteria
Increased risk of infection can result due to decreased immunoglobulin levels, a critically important protein susceptible to loss in the urine.

Thromboembolism
Trombone-Elmo
Patients with nephrotic syndrome are hypercoagulable, making them more prone to developing a thromboembolism. This occurs from proteinuria and loss of anticoagulant proteins like antithrombin III and plasminogen. Pro-coagulation is additionally increased as clotting factors I, VII, VIII and X increase as a result. Furthermore, because albumin is lost in the urine, there is decreased binding of plasminogen to fibrin leading to impaired fibrinolysis. Albumin losses increase the availability of thromboxane A2 (normally bound to albumin, but now moving freely in the serum), leading to platelet aggregation.

Hyperlipidemia
Hiker-lips
Hyperlipidemia is thought to be caused by increased synthesis of lipoproteins in the liver.

Fatty casts
Fat-guy in a Cast
Fatty casts are groups of lipid-rich epithelial cells in the kidney, formed due to elevated lipid levels and are seen on microscopic urinalysis.

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