An explanatory framework connecting immunology to primary membranous nephropathy.

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Abstract

Immune deposits, principally Immunoglobulin (IgG) and complement are deposited under the epithelium in Membranous Nephropathy (MN), the major cause of nephrotic syndrome in adults. With the capacity to test circulating autoantibodies to PLA2R and the discovery that the Phospholipase A2 Receptor (PLA2R) is the target antigen in the majority of cases, the field made significant progress. Since then, evidence for the existence of new target antigens such as semaphorin 3B, exostosins 1 and 2, neural EGFL like 1 and thrombospondin type 1 domain containing 7A has been presented. The humoral component of primary membranous nephropathy has become clearer with the capacity to identify and track the levels of circulating autoantibodies. Approximately 75% of all MN in developed nations are idiopathic or primary; the remaining 20%-25% are secondary to variable circumstances, such as infections (HBV, hepatitis B and C, HIV infection, malaria, etc.), malignant neoplasms (lung, breast, stomach and prostate cancer, lymph proliferative disorder, etc.) and systemic autoimmune diseases.

Keywords: Primary membranous nephropathy, Immunoglobulin, Autoimmune diseases, Autoantibodies, Nephrotic syndrome

Introduction

A build-up of an immune complex on the extra capillary side of the glomerular basement membrane characterises the glomerular illness known as Membranous Nephropathy (MN) histopathologically as diffuse thickening of the glomerular capillary wall under light microscopy (GBM). Immuno Fluorescence (IF) and electron microscopy both show that the immunological deposits are composed of Immunoglobulin (IgG) (mostly IgG4 in idiopathic form) and complement fraction C3 in a pattern of peripheral capillary loops (EM) [1].

Since autoantibodies co-localize with the target antigens to produce subepithelial Immune Complexes (IC), which activate complement and cause podocytes destruction and proteinuria, IMN is regarded as an organ-specific autoimmune disease. In the autoimmune condition known as Idiopathic Membranous Nephropathy (IMN), immunological tolerance is compromised, causing the body to overreact by producing antibodies against its own antigens. T-B cells play a significant role in immune function even though antibodies are produced by plasma cells that B cells help develop. In particular, the subsets of helper T (Th) cells, including the dominant subsets like Th2, Th17 and follicular helper T (Tfh) cells and the inferior subsets like regulatory T (Treg) cells, influence the immunological imbalance of IMN and encourage the occurrence and development of autoimmune responses [2].

Description

As a form of glomerular illness that pathologically presents as a thickness of the GBM and is clinically characterised by significant proteinuria and edoema, membranous nephropathy originally known as Membranous Glomerulonephritis (MGN) was initially described by Bell in 1946. Due in large part to a number of notable pioneers, understanding of the pathophysiology of MN advanced quickly in the latter half of the 1950's. Mellors and Orgeta used immunofluorescence in 1956 to find immunoglobulins in the glomeruli deposits. Jones used periodic acid silver methenamine stain to show that there were silver positive rods extending from the GBM in 1957. And using electron microscopy in 1959, Movat established the causal connection between the thickening of the GBM and protein deposition between the GBM and the podocytes [3].

It's possible that membrane nephropathy has no visible indications or symptoms. When a normal urine test is done for another medical reason and it reveals that you have excessive levels of protein in your urine that is when it is identified (proteinuria). If you do experience any of the telltale signs or symptoms of protein in the urine, your doctor will do a thorough physical examination and inquire about your medical history. You'll have your blood pressure taken. Doctor can diagnose membranous nephropathy and determine how well your kidneys are functioning with blood, urine and imaging tests. They can also aid in eliminating any further potential reasons of your symptoms. A kidney ultrasound or Computed

Tomography (CT), an anti-PLA2R antibody test, a urine test (urinalysis), a Glomerular Filtration Rate (GFR) test, an Antinuclear Antibody (ANA) test and a kidney biopsy [4].

Addressing the underlying cause of your disease and treating your symptoms are the main goals of treatment for membranous nephropathy. There is no guaranteed treatment. The symptoms of membranous nephropathy, however, can totally subside (go into remission) in up to 3 out of 10 patients after 5 years of no treatment. A quarter to a third of patients experience partial remission. Membranous nephropathy that is brought on by a drug or another condition, such as cancer, will typically get better when the drug is stopped or the condition is managed [5].

Conclusion

Doctors can now measure both the amount of protein in the urine and antibody levels in the blood when determining risk. This method aids medical professionals in predicting how you'll react to treatment. The following therapies for membranous nephropathy may be discussed with you by your doctor if you have a moderate to high risk of developing advanced kidney disease: Steroids with cyclosporine and rituximab, two chemotherapeutic drugs (Rituxan), after treatment is finished, the condition can occasionally return. People who take immune suppressants of any kind have experienced this. Some patients may benefit from a second round of treatment if the first.

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