MANNAN-BINDING LECTIN (MBL): BEYOND PRIMARY IMMUNODEFICIENCY AND RECURRENT INFECTIONS

Diabetes
Oncology
Autoimmune disease
Renal disease
Viral infections
Cardiovascular complications
Lung disease
Transplantation

Expand YOUR research into other disease areas
MBL: Beyond Primary Immunodeficiency

Diabetes Complications

Association between mannose-binding lectin, high-sensitivity C-reactive protein and the progression of diabetic nephropathy in type 1 diabetes.

Aim: To investigate the associations of the complement activator mannose-binding lectin (MBL) and the inflammatory marker high-sensitivity C-reactive protein (hsCRP) with the development of nephropathy in a large prospective study of patients with type 1 diabetes.

"This study demonstrates that concentrations of both MBL and hsCRP are associated with the progression of renal disease in type 1 diabetes."

Renal Disease

High levels of mannose-binding lectin are associated with lower pulse wave velocity in uraemic patients.

Aim: The study evaluated the potential impact of MBL on vascular parameters in uraemic patients.

"High levels of MBL are associated with lower pulse wave velocity and the use of antihypertensive drugs in a cohort of patients with end stage renal disease awaiting kidney transplantation suggesting a beneficial role of high levels of MBL on arterial stiffness in uraemia."

Rheumatoid Arthritis

Mannose binding lectin and susceptibility to rheumatoid arthritis in Brazilian patients and their relatives.

Aim: To associate the functional role of circulating MBL serum levels and MBL2 variants in clinically classified patients with rheumatoid arthritis and their relatives in a Brazilian cohort.

"In conclusion, our results suggest a significant association of functional MBL2 polymorphism and MBL serum levels with RA susceptibility in the Brazilian population. MBL levels may be considered when choosing the therapeutic strategy for RA patients."

Pulmonary Fibrosis

The Deficiency of Serum Mannose Binding Lectin in Early Onset Idiopathic Pulmonary Fibrosis and Familial Cases.

Aim: To examine the serum MBL in healthy controls, frequently exacerbating Chronic Obstructive Pulmonary Disease, Pulmonary Tuberculosis and Sarcoidosis along with Interstitial Pneumonitis/Idiopathic Pulmonary Fibrosis patients, including those with and without an affected family member.

"The data suggests that MBL deficiency is common in early onset disease UIP/IPF and cases with an affected relative. The other groups do not show such a defect and their levels are consistent with published data. The action of MBL is central to much of the described histology changes and this observation needs expanding to further cases to gain a fuller understanding of its likely role in the disease process."

Distribution of MBL levels in RA patients segregated by clinical parameters. Distribution of MBL levels according to presence of nodules (A), Secondary Sjögren’s syndrome (B), positivity for anti-CCP (C) and positivity for Rheumatoid factor (D). Adapted from Goeldner I et al., PLoS ONE (2014).

Pattern of MBL deficiency for different patient groups. HC – Healthy Controls; COPD - Chronic Obstructive Pulmonary Disease, Pulmonary Fibrosis, IPF - Idiopathic Pulmonary Fibrosis. FH – Family History. (% of cases)


Diabetes

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Cumulative progression (%)

<table>
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<tr>
<th>Observation time (years)</th>
<th>MBL and hsCRP below</th>
<th>MBL below and hsCRP above</th>
<th>MBL above and hsCRP below</th>
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<tbody>
<tr>
<td>0.0</td>
<td>20</td>
<td>15</td>
<td>12</td>
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<td>0.5</td>
<td>15</td>
<td>10</td>
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<tr>
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<td>2.0</td>
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</table>

Cumulative incidence of progression from normoalbuminuria to microalbuminuria during follow-up according to both baseline MBL and hsCRP levels. The sex-specific MBL level median is 1,864 μg/l in men and 1,643 μg/l in women and for hsCRP is 1.72 mg/l in men and 2.10 mg/l in women. Adapted from Hansen TK et al., Diabetologia (2010).


Chemotherapy

Association between deficiency of mannose-binding lectin and severe infections after chemotherapy.

**Aim:** The aim of the study was to measure MBL in patients with leukaemia who were scheduled to undergo chemotherapy (ie, a population especially susceptible to infection) and related the results to severity of infection after chemotherapy.

“We showed a significant association between low concentrations of MBL and serious infections related to chemotherapy (p<0.0001). These results suggest that increasing concentrations of MBL in patients having chemotherapy could reduce susceptibility to infection.”

“In our study severity of infection indicated what was a clinically relevant concentration of MBL.”

**Hepatitis B**

Mannose-binding lectin in chronic hepatitis B virus infection.

**Aim:** To investigate the roles of MBL and its gene (mbl2) polymorphisms, -221A/Y and codon 54 in hepatitis B virus (HBV) infection.

“The mbl2 polymorphisms that result in low serum MBL levels associate with the occurrence of cirrhosis and hepatocellular carcinoma in progressed carriers. Moreover, MBL is able to bind to HBsAg, resulting in complement activation. These findings should provide new approaches to elucidating the mechanisms of clearance of HBV and HBV containing immune complexes as well as understanding disease progression.”

**HIV**

The lectin pathway of complement: advantage or disadvantage in HIV pathogenesis?

**Aim:** The pattern recognition molecules of the lectin complement pathway are important components of the innate immune system with known functions in host-virus interactions. This paper summarizes current knowledge of how these intriguing molecules, including MBL may influence HIV-pathogenesis.

“It has been demonstrated that MBL is capable of binding and neutralizing HIV and may affect host susceptibility to HIV infection and disease progression. In addition, MBL may cause variations in the host immune response against HIV.”

**Dengue**

Complement-mediated neutralization of dengue virus requires mannose-binding lectin.

“Here, we show that mannose-binding lectin (MBL), a pattern recognition molecule that initiates the lectin pathway of complement activation, neutralized infection of all four DENV serotypes through complement activation-dependent and-independent pathways. Moreover, we observed a direct correlation with the concentration of MBL in human serum and neutralization of DENV infection.”

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**References**


Mannan-Binding Lectin
Helpful knowledge throughout our lives

<table>
<thead>
<tr>
<th>Kit</th>
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<th>Product description</th>
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<tbody>
<tr>
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<td>KIT 029</td>
<td>MBL Oligomer ELISA Kit</td>
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<td>SER 101</td>
<td>MBL standard serum (human) - 1000 (AU)</td>
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<td>SER 103</td>
<td>MBL oligomer deficient serum, B/C genotype (human)</td>
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<td>BW 028 (HYB 131-01 &amp; HYB 131-01B)</td>
<td>Human MBL Matched Antibody Pair</td>
<td>200 µL capture antibody and 50 µL detection antibody, 1 mg/mL</td>
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<td>HYB 131-01B</td>
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