

**Genotyping of Mannose-Binding Lectin variant alleles**  
**in Egyptian infants with acute respiratory tract infections**

**Thesis**

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## **DEDICATION**

- To my lovely mother and father.
- To my helpful wife & my son Eyad.
- To babies parents who helped me to achieve my work
- To my prof Dr: Rabah Mohamed Shawky ,prof Dr:Sherine Abd-Elfattah & Dr Tarek kamal.

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*Mohamed Ahmed El-saieed*

# CONTENTS.

<i>Title</i>	<i>Page</i>
<b>Introduction</b>	<b>۱</b>
<b>Aim of the Work</b>	<b>۲</b>
<b>Review of Literature</b>	
<b>Chapter I :Immune response.</b>	<b>۳</b>
<b>Chapter II :Mannose binding lectin.</b>	<b>۲۳</b>
<b>Chapter III : MBL in respiratory tract infection</b>	<b>۵۳</b>
<b>ChapterIV : MBL replacement therapy</b>	<b>۷۰</b>
<b>Subjects and Methods</b>	<b>۷۴</b>
<b>Results</b>	<b>۷۹</b>
<b>Discussion</b>	<b>۱۰۰</b>
<b>Summary &amp;Conclusions</b>	<b>۱۱۰</b>
<b>Recommendations</b>	<b>۱۱۴</b>
<b>References</b>	<b>۱۱۵</b>

# **LIST OF FIGURES**

**Figure ١ :** Schematic presentation of immunity components .

**Figure ٢ :** Integrated human immune response .

**Figure ٣ :** Structure of an antibody.

**Figure ٤ :** Homotrimer of mannose binding lectin peptides , the basic structural unit on mannose binding lectin .

**Figure ٥ :** Comparison of the lectin and classical pathways of complement activation .

**Figure ٦ :** Mannose binding lectin gene and protein structure.

**Figure ٧ :** Schematic representation of mannose binding lectin pathway of complement activation and its role in clearance or infectivity by various pathogens.

**Figure ٨ :** Model of mannose binding lectin collaborations with phagocytosis and Toll-like receptors signaling .

**Figure ٩ :** Mannose binding lectin opsonization redirects staphylococcus aureus from tight to spacious phagosomes .

**Figure ١٠ :** Schematic representation of the alveolus capillaries illustrating the potential roles of mannose binding lectin in modulating respiratory tract infection .

**Figure ١١ :** Distribution of hemoglobin levels in both groups.

**Figure ١٢ :** Distribution of RBCs count ( $\times 10^6/\text{UI}$ ) in both groups.

**Figure ١٣ :** Distribution of WBCs count ( $\times 10^3/\text{UI}$ ) in both groups.

**Figure ١٤ :** Distribution of PNL in both groups.

**Figure ١٥ :** Distribution of lymphocytes in both groups.

**Figure ١٦ :** Distribution of MCV(fl) in both groups

**Figure ١٧ :** Distribution of patients in both groups according CRP status.

**Figure ١٨ :** Distribution of patients in both groups according to the presence of cyanosis .

**Figure ١٩ :** Distribution of patients in both groups according to grunting status .

**Figure ٢٠ :** Distribution of patients in both groups according to the grade of respiratory distress .

**Figure ٢١ :** Distribution of respiratory rate (per minute) in both groups.

**Figure ٢٢ :** Distribution of Heart rate (per minute) in both groups.

**Figure ٢٣ :** Mannose binding lectin promoters (LX.HY,LY) genotyping of studied population.

**Figure ٢٤ :** Distribution of mannose binding lectin Codon ٥٤ polymorphism among patients and controls .

**Figure ٢٥ :** Relationship between mannose binding lectin promoters and grade of respiratory distress in ICU neonates.

**Figure ٢٦ :** Relationship between mannose binding lectin promoters and grade of respiratory distress in infants (N=٢٥)

**Figure ٢٧ :** Relationship between mannose binding lectin codon ٥٤ genotypes and grade of respiratory distress among ICU neonates (N=٢٤)

**Figure ٢٨ :** Relationship between mannose binding lectin codon ٥٤ genotypes and grade of respiratory distress among infants (N=٢٥)

**Figure ٢٩:** MBL٢ genotyping.

**Figure ٣٠:** MBL٢ genotyping

**Figure ٣١:** MBL٢ genotyping

## **LIST OF TABLES**

**Table ١ :**Variant alleles of mannose binding lectin in different populatins.

**Table ٢ :** Some clinically relevant microorganisims recognized by mannose binding lectin.

**Table ٣ :**Age distribution of patients in study.

**Table ٤ :**Comparison between ICU neonates and infants groups as regards lab. Findings.

**Table ٥ :** Distribution of studied population according to CRP .

**Table ٦ :** Chest x-ray findings among ICU neonates and infants groups in the study.

**Table ٧ :** Incidence of cyanosis among ICU neonates and infants groups in the study.

**Table ٨ :** Incidence of grunting among ICU neonates and infants groups in the study.

**Table ٩ :** Distribution of studied population according to the grade of respiratory distress .

**Table ١٠ :** Mean values for heart and respiratory rates amongstudied groups .

**Table ١١ :** Mannose binding lectin promoters (LX.HY,LY) genotyping of studied population.

**Table ١٢ :** Distribution of mannose binding lectin Codon ٥٤ polymorphism among patients and controls .

**Table ١٣ :** Relationship between mannose binding lectin promoters and grade of respiratory distress in ICU neonates.

**Table ١٤ :** Relationship between mannose binding lectin promoters and grade of respiratory distress in infants (N=٢٥)

**Table ١٥ :** Relationship between mannose binding lectin codon ٥٤ genotypes and grade of respiratory distress among ICU neonates (N=٢٤)

**Table ١٦ :** Relationship between mannose binding lectin promoters and grade of respiratory distress among infants (N=٢٥)

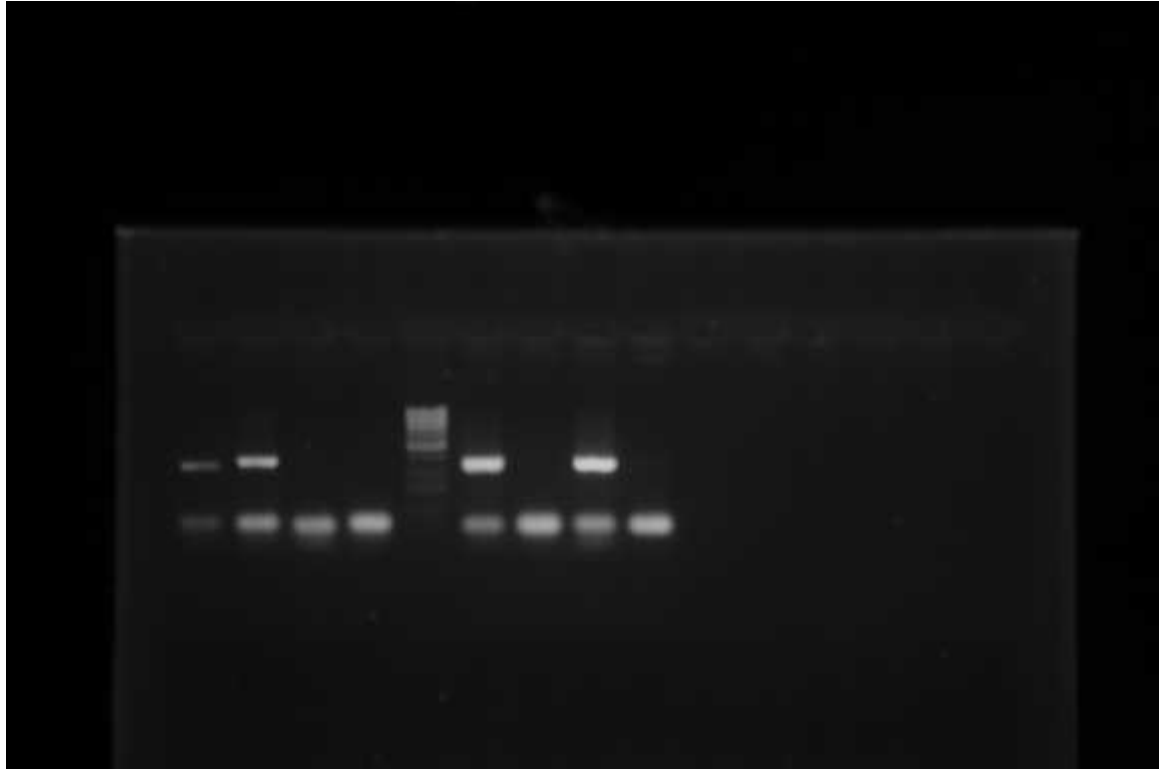


# **LIST OF ABBREVIATIONS**

<b>MBL:</b>	Mannose binding lectin.
<b>PAMP:</b>	Pathogen associated molecular patterns.
<b>DAMP:</b>	Damage-associated molecular patterns.
<b>PRP:</b>	Pattern recognition receptors.
<b>TOL:</b>	Toll-like receptors.
<b>CLR:</b>	C-type lectin receptor.
<b>NOD:</b>	Nucleotide oligomerization domain.
<b>NLR:</b>	Nucleotide oligomerization domain like receptors.
<b>RIG:</b>	Retinoic acid-inducible gene.
<b>RIR:</b>	Retinoic acid-inducible gene like receptors.
<b>NFκB:</b>	Nuclear factor kappa B.
<b>NK cells:</b>	Natural killer cells.
<b>MHC:</b>	Major histocompatibility.
<b>DC:</b>	Dendritic cells.
<b>APCs:</b>	Antigen presenting cells.
<b>TCR:</b>	T cell receptors.
<b>γδ T:</b>	Gamma delta T cells.
<b>IgM:</b>	Immunoglobulin M.
<b>IgA:</b>	Immunoglobulin A.
<b>IgG:</b>	Immunoglobulin G.
<b>IgD:</b>	Immunoglobulin D.
<b>VLR:</b>	Variable lymphocyte receptor.

<b>MBP:</b>	Mannan binding protein.
<b>SP-A:</b>	Surfactant proteins A.
<b>SP-D:</b>	Surfactant proteins D.
<b>MASP:</b>	Mannose-associated serine proteases.
<b>GlcNAc:</b>	N-acetyl-D-glucosamine.
<b>Allo-HSCT:</b>	Allogeneic hematopoietic stem cell transplantation.
<b>COP:</b>	Coat protein complex.
<b>CRP:</b>	C reactive protein.
<b>SBP:</b>	Spontaneous bacterial peritonitis.
<b>Lea-Leb:</b>	Lewis A and Lewis B.
<b>LTA:</b>	Lipoteichoic acid.
<b>LBP:</b>	Lipopolysaccharide binding protein.
<b>C:</b>	Complement.
<b>MAC:</b>	Mycobacterium avium complex.
<b>BAL:</b>	Bronchoalveolar lavage.
<b>COPD:</b>	Chronic obstructive pulmonary disease.
<b>CF:</b>	Cystic Fibrosis.
<b>SSI:</b>	Statens serum institute.
<b>CRC-VT:</b>	Co-operative Research Centre for Vaccine Technology

Figure ٢٩:



Lane no. 1 : mutant allele CD ( 100 bp)

Lane no. 2 : Positive variant allele LX in the promoter of mbl gene.

Lanes no. 3 and 4 : Negative HY and LY variant alleles in the promoter of mbl gene.

Lane no. 5 : Molecular weight marker ( 100 bp).

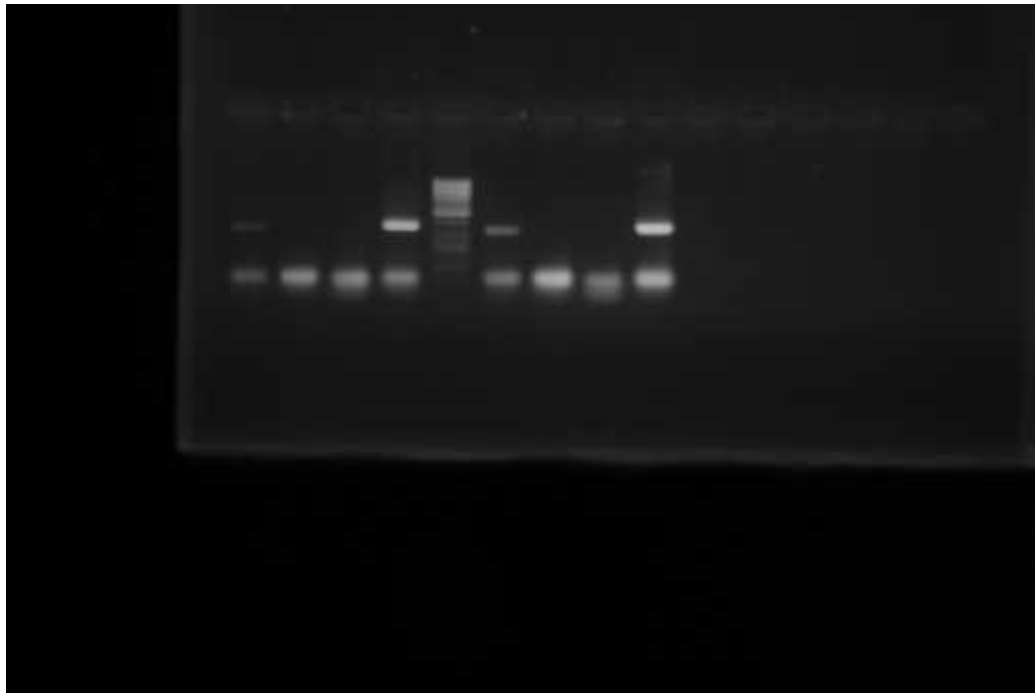
Lane no. 6 : Positive for HY variant allele in the promoter of mbl gene.

Lane no. 7 : Negative LX variant allele in the promoter of mbl gene.

Lane no. 8 : Wild type allele ( 100 and 150 bp).

Lane no. 9 : Negative LY variant allele in the promoter of mbl gene.

Figure 3:



Lane no. : mutant allele CD ( bp)

Lane no. : Negative variant allele LX in the promoter of mbl gene.

Lane no. : Negative HY variant allele in the promoter of mbl gene.

Lane no. : Negative LY variant allele in the promoter of mbl gene.

Lane no. : Molecular weight marker ( bp).

Lane no. : Positive for LY variant allele in the promoter of mbl gene.

Lane no. : Negative LX variant allele in the promoter of mbl gene.

Lane no. : Negative HY variant allele in the promoter of mbl gene

Lane no. : Wild type allele ( and bp).

**Subject and method**

Figure 31:

## **Introduction**

Acute respiratory tract infections are among the most prevalent infections in childhood worldwide, with the highest incidence among children younger than 5 years (Graham, 1990).

Many risk factors have been identified to contribute to occurrence of respiratory tract infections; however, it is also possible that innate characteristics of the individuals such as genetic factors could play a role, and various attempts have been made to analyze the human genetic composition in relation to both infection susceptibility and development of clinical manifestations (Choi et. al., 2003).

Mannose-Binding Lectin (MBL) is a serum protein (Turner, 1996) and believed to be particularly important in the early stages of primary infections in infants during the decay of maternal antibodies (Super et. al., 1989). The MBL is known to be an important component of innate immunity toward microbes by activating complement and augmenting opsonization and phagocytosis (Garred et. al., 2006). MBL is known to play a role in enhancing attachment, ingestion and killing of opsonized pathogens by phagocytes (Kuhlman et. al., 1989) and activation of complement system through the MBL-associated serine protease (Matsushita et. al., 1992). There is evidence that the risk of developing bacteremia might be genetically modulated (Adewoye et. al., 2006). The susceptibility to *W. bancrofti* infection also appears to be significantly affected by the MBL expression genotype of the host (Dan et. al., 2010). Trans-racial studies have looked at the association between the status of MBL protein production, the MBL genotype and the clinical phenotype (Mombo et. al., 2003). A single gene, *MBL2* located at chromosome 10, codes for human MBL and exerts its action through binding to high mannose and N-acetyl glucosamine oligosaccharides present on various microorganisms (Thiel et. al., 1997).

## **Aim of the work**

The present study aimed at:

- ١-Characterization of the structural alleles of *MBL* gene located on chromosome ١٠ (high- and low-MBL expression genotypes).
- ٢- Trying to make a correlation between genotyping of *MBL* alleles and occurrence of acute respiratory tract infections in Egyptian infants.
- ٣- Trying to find out the most prevalent *MBL* variant alleles among the Egyptian samples in study.