PLASMAPHERESIS IN RHEUMATOLOGICAL DISEASES

Essay
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Mohamed Mahmoud Mohamed

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LIST OF ABBREVIATIONS

Abbreviations	Meaning
AABB	American association of blood banks
AAV	Associated small vessel vasculitis
ACPA	Anti citrullinated protein antibody
AD	Alzheimer's disease
ADAMTS	A Disintegrin And Metalloproteinase with Thrombospondin Motifs
AH	Alveolar haemorrhage
AMA	Anti-mitochondrial antibody
ANA	Anti nuclear antibody
ANCA	Anti-neutrophil cytoplasmic antibody
Anti-B2GPJ	Anti-B2 glycoprotein I
Anti-CCP	Anti-cyclic citrullianted peptide
anti-CENP-B	Centromere-protein B
anti-ds-DNA	Double stranded DNA
anti-histone	Histone protein
anti-Jo-1	Patient name
anti-Ku or anti-SL	Patient name or sicca lupus antigen
anti-PM-Scl (PM1)	Polymyositis sclerodermic antigen 100 kDa
Anti-PR3	Anti-proteinase 3
anti-Scl-70	Scleroderma antigen 70 kDa
anti-Sm	Smith-antigen
anti-SS-A/Ro	Robert-antigen or soluble substance A nuclear antigen
anti-SS-B/La	Lane-antigen or soluble substance B nuclear antigen
anti-ss-DNA	Single stranded DNA
anti-U1-snRNP	Small nuclear uridine-rich ribonucleoproteins
aPL	Anti-phospholipid antibody
APS	Anti-phospholipid syndrome
ARF	Acute renal failure
ASFA	American society for apheresis
BW	Body weight

LIST OF ABBREVIATIONS (Cont…)

Abbreviations	Meaning
c-ANCA	Cytoplasmic ANCA
CAPS	Catastrophic antiphospholipid syndrome
CCL2	Chemokine ligand 2
CCXCL 10	Chemokine X chemokine ligand 2
CF	Centrifugation
CG	Cryoglobulinaemia
CHB	Complete heart block
CIC	Circulatory immune complex
CPFA	Coupled plasma filtration adsorption
CPFIA	Coupled plasma filtration immune adsorption
CREST	Calcinosis, Raynaud's phenomenon, esophageal dysmotility, sclerodactyly
CRRT	Continuous renal replacement therapy
CSA	Cyclosporine A
CV	Hepatitis C virus
DAH	Diffuse alveolar haemorrhage
DM	Dermatomyositis
DMARDs	Disease modifying anti-rheumatic drugs
dsDNA	Double stranded DNA
ELISA	Enzyme linked immunosorbent assay
EPV	Estimated plasma volume
FFP	Fresh frozen plasma
GBM	Glomerular basement membrane
GBS	Guillian-Barre syndrome
HCT	Haematocrit
HES	Hydroxyethylstarch solution
HIV	Human immuno-deficinecy virus
HLA	Human leucocytic antigen

LIST OF ABBREVIATIONS (Cont…)

Abbreviations	Meaning
HSP	Human epidermoid carcinoma, larynx, hela markers
HSP	Henoch schonlein purpura
HTLV	Human T-lymphotropic virus
HUS	Hemolytic uremic syndrome
IC	Immune complex
IFA	Immunofluorescence assay
IgM	Immunoglobulin M
IVCY	Intravenous cyclophosphamide pulse therapy
IVIG	Intra venous immunoglobulin
LA	Lupus anti-coagulant
Le CELLS	Lupus erythromatosus cells
LN	Lupus nephritis
MAHA	Microangiopathic hemolytic anemia
MAS	Macrophage activation syndrome
MC	Mixed cryoglobulinemia
MCTD	Mixed connective tissue disease
MCV	Anti-mutated citrullinated vimentin
MP	Microscopic polyangitis
MPO	Myeloperoxidase
MTX	Methotrexate
MW	Molecular weight
NMO	Neuromyelitis optica
PA or PP	Plasmapheresis
P-ANCA	Perinuclear ANCA
PBC	Primary biliary cirrhosis
PCNA	proliferating cell nuclear antigen
PF	Plasma filtration
PRS	Pulmonary renal syndrome

LIST OF ABBREVIATIONS (Cont...)

Abbreviations	Meaning
RA	Rheumatoid arthritis
RF	Rheumatoid factor
RIA	Radioimmuno assay
RPGN	Rapidly progressive glomerulonephritis
RPLS	Reversible posterior leukoencephalopathy syndrome
s-IBM	Sporadic inclusion body myositis
SJS	Sjogren's syndrome
SLE	Systemic lupus erythromatosus
SOJIA	Systemic onset juvenile idiopathic arthritis
SSC	Systemic sclerosis
TA	Takayasu arteritis
TMA	Thrombotic microangiopathy
TPE	Therpaeutic plasma exchange
TROVE	Telomerase ro-vault element
TTP	Thrombotic thrombocytopenic purpura
VHC	Viral hepatitis C
VT	Vascular thrombosis


بسم الله الرحمن الرحيم
وَأَنْزَلَ اللهُ عَلَيْكَ الْكِتَابَ والْحِكْمَةَ وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ وَكَانَ فَضْلُ اللهِ عَلَيْكَ عَظِيمًا
صدق الله

INTRODUCTION

Plasmapheresis (PP) is an extracorporeal technique used to remove pathogenic macromolecules from the plasma. Plasmapheresis is used to treat neurological, renal, hematological as well as systemic diseases, which explains why many different specialties in medicine can be involved. Plasmapheresis has evolved in forty years into a frequently used, relatively safe procedure. Nowadays a large spectrum of different techniques exists, each with its own possible complications ***(Pruijm et al., 2008)***.

Yu et al. (2007) evaluated the efficacy of plasmapheresis in the treatment of patients with active rheumatoid arthritis through selective removal of large molecular weight substances like rheumatoid factor and IgM. They reported that PP therapy significantly altered the signs and symptoms of active rheumatoid arthritis. There were increases in physical function and improvement in quality of life.

VRT101 is a 21-mer peptide located at the globular part of the laminin-alpha chain. Anti-VRT101 antibodies are abundantly detected in the serum of patients with systemic lupus erythematosus (SLE) and correlate with disease activity. Specific removal of serum anti-VRT101 by extracorporeal plasmapheresis with specific immunoadsorption on the VRT101-coupled sepharose

columns may serve as a new therapeutic tool for specific immunoadsorption of pathogenic antibodies in SLE patients ***(Amital et al., 2007)***.

Sanna et al. (2008) reviewed the clinical approach to therapy in patients with SLE and neuropsychiatric involvement and reported that plasmapheresis may also be added in severe cases of symptoms refractory to conventional treatment.

Ferri (2008) reported also that plasmapheresis altered the progression and severity of the clinical manifestations in patients suffering from mixed cryoglobulinemia. ***Scarpato et al. (2007)*** reported that plasmapheresis can be used as effective further therapy to minimize cutaneous, renal and/or neurologic involvement.

PP also used in vasculitis for example Kawasaki disease which is an acute, self-limited vasculitis of childhood. Markers of inflammation, such as CCL2 and CCXCL10, contribute to the pathology and the diagnosis of Kawasaki disease. ***Pinna et al. (2008)*** reported that forms of the disease refractory to intravenous administration of immunoglobulin therapy responded to plasmapheresis.

Plasmapheresis may be used to treat pregnant women with documented antiphospholipid syndrome when first lines (aspirin and/or heparin) fail to prevent pregnancy loss ***(El-Haieg et al., 2007)***.

Choy et al. (2005) reported on a systematic evidence review of immunotherapy for dermatomyositis and polymyositis. The authors concluded that this systematic review highlights the lack of high quality randomised controlled trials that assess the efficacy and toxicity of immunosuppressants in inflammatory myositis.

AIM OF THE WORK

This essay aims to study various techniques of plasmapheresis and their role in treatment of different rheumatological diseases.