Outcome of Lupus Nephritis in Children

Thesis

Submitted for partial fulfillment of the
Master degree in Pediatrics

By
Yasmeen Mohammed Mahmoud Selim
B.Sc. of Medicine, Cairo University

Supervised by
Prof. Dr. Samia Salah El-Deen Mahmoud
Professor of Pediatrics
Faculty of Medicine, Cairo University

Dr. Huda Marzouk Mohammed
Lecturer of Pediatrics
Faculty of Medicine, Cairo University

Dr. Hanan Abd EL-Aziz Ahmed
Lecturer of Pediatrics
Faculty of Medicine, Cairo University

Pediatric Department
Faculty of Medicine, Cairo University
2015

Acknowledgment

First and foremost thanks to “Allah”, the most kind and the most merciful. I wish to express my sincere gratitude and utmost thanks to prof. ***Dr. Samia Salah EL-Deen Mahmoud***, professor of Pediatrics, Faculty of Medicine, Cairo University, for her continuous encouragement, valuable advice and kind supervision.

I am also sincerely thankful to ***Dr. Huda Marzouk***, Lecturer of pediatrics at the rheumatology clinic and also to ***Dr. Hanan Abd EL-Aziz***, Lecturer of pediatrics at the nephrology unit, for their continuous supervision and meticulous revision of this work.

I would like also to thank all the staff members of the pediatric rheumatology clinic for their great help in conducting this work.

Deep appreciation to my great parents for their outstanding help and support offered throughout conducting this work.

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Ab : Antibody
ACEI : Angiotensin converting enzyme inhibitors
ACR : American College of Rheumatology
aCL : Anticardiolipin antibodies
AI : Activity index
ALMS : Aspreva Lupus Management Study
ANA : Antinuclear antibody
Anti-ds DNA : Antidouble stranded DNA antibody.
Anti-sm : Anti-smith
APS : Antiphospholipid syndrome
aPL : Antiphospholipid antibodies
aPTT : Activated partial thromboplastin time
ARB : Angiotensin receptor blockers
AZA : Azathiopurine
BSA : Body surface area
BUN : Blood urea nitrogen
C : Complement
CD : Cluster determinant
CKD : Chronic kidney disease
CNS : Central nervous system
CYC : Cyclophosphamide
DPGN : Diffuse proliferative glomerulonephritis
Ds-DNA : Double stranded Deoxyribonucleic acid
ELISA : enzyme-linked immunosorbent assay

EM : Electron microscopy
ESRD : End stage renal disease
FPGN : Focal proliferative glomerulonephritis
GFR : Glomerular filtration rate
GWAS : Genome wide-association studies
HCQ : Hydroxychloroquine
HLA : Human leukocyte antigen
HPF : High power field
IC : Immune complex
IF : Immunofluorescence
IFN : Interferon
Ig : Immunoglobulin
IL : Interleukin
IMPDH : Inhibitor of inosine-5-monophosphate dehydrogenase
IV : Intravenous
IVIG : Intravenous immunoglobulin
JSLE : Juvenile-Systemic lupus erythematosus
KCT : Kaolin clotting time
KDIGO : Kidney Disease Improving Global Outcomes
LAC : Lupus anticoagulant
LN : Lupus nephritis
LM : Light microscopy
6-MP : 6-mercaptopurine
MHC : Major histocompatibility complex
MCTD : Mixed connective tissue disease
mAb : Monoclonal antibody

MMF : Mycophenolate mofetil
MTX : Methorexate
NK : Natural killer
NIH : National institute of health
NSAID : Non steroidal anti-inflammatory drugs
RBC'S : Red blood corpuscles
RNP : Ribonucleoprotein
RPS : Renal Pathology Society
RTX : Rituximab
SD : Standard deviation
SELENA : Safety of Estrogens in Lupus Erythematosus National Assessment
SLE : Systemic lupus erythematosus
SLE-DAI : Systemic lupus erythematosus disease activity index
SLICC-DI : The Systemic Lupus International Collaborating Clinics Damage Index
TH : T-helper
TNF-α : Tumor necrosis factor alpha
TPMT : Thiopurine methyltransferase
TTP : Thrombotic thrombocytopenic purpura
WBC'S : White blood corpuscles
WHO : World health organization
UVA : Ultraviolet A light
UVB : Ultraviolet B light

Abstract

Background: Lupus nephritis is one of the main clinical presentations determining the course and outcome of systemic lupus erythematosus in children. The aim of our study is to determine the outcome of lupus nephritis and the risk factors affecting it in children.

Objective: To determine the outcome of lupus nephritis in children and the different risk factors affecting it.

Methods: This study is a retrospective study of 50 patients with lupus nephritis following in the rheumatology clinic at Cairo University children hospital and described their different clinical, laboratory and pathological presentation, to investigate the clinicopathological correlation, medications received and renal outcome.

Results: The majorities of our patients were class IV lupus nephritis (44%) and were CKD stage I (46%). 2% of our patients died. 8% were subjected to temporary hemodialysis and no patient ended as ESRD on regular hemodialysis. Proteinuria and hematuria were associated with worsening of GFR. The method of induction wasn't found to affect the outcome, however the Mycophenolate mofetil and Azathioprine doses tend to be higher in the group with improved GFR.

Conclusion: Urinary abnormalities may precede decline in GFR. Proteinuria and hemolytic anemia could contribute to non-improvement or worsening of the GFR. Patients having a higher risk of poor renal outcome need more close observation and aggressive therapy.

Key words: Lupus nephritis, Renal outcome, Children.

Introduction

SLE is an autoimmune disease with various clinical manifestations. About 10–15% of all SLE patients are diagnosed in childhood at less than 16 years of age. LN is one of the main clinical presentations determining the course and outcome in patients with SLE. Nephritis complicates SLE in approximately 25-50% of patients and is associated with increased mortality **(Oktadianto et al., 2014)**.

The SLE manifestation of overt nephropathy is more common in children than adults. Patients with severe histological forms of nephritis have more severe renal manifestations. Although several studies have reported on factors affecting outcomes, the results remain unclear. Possible prognostic factors are male gender, black race, onset before puberty, persistent hypertension, hypertensive crisis, impaired renal function, nephrotic syndrome, anemia and class IV nephritis **(Oktadianto et al., 2014)**.

Although the prognosis of LN has improved in recent decades, varying degrees of chronic renal impairment, including ESRD, can still develop. Thus, children with LN require early and adequate treatment to protect the kidneys from developing chronic damage. However, determining the optimal balance between potential benefits and adverse side effects of the drugs is always a difficult process in the management of pediatric LN and there is still no consensus on the best treatment model **(Demircin, 2013)**.

Aim of work

To determine the outcome of lupus nephritis in children and the various risk factors affecting it and to investigate the clinicopathological correlation and the medications received.

Systemic lupus erythematosus

Definition

Systemic lupus erythematosus (SLE) is an autoimmune disease in which organs, tissues and cells undergo damage mediated by tissue-binding autoantibodies and immune complexes ***(Hahn [a], 2005).***

Epidemiology

The best estimate is that SLE affects between 5000 and 10,000 children in the United States ***(Pineles et al., 2011)***.

Juvenile-SLE (JSLE) affects girls more often than boys (8:1), even in the prepubescent age group (4:1). SLE can occur at any age, although it becomes more frequent after five years of age and is increasingly prevalent after the first decade of life ***(Lehman et al., 1989)***.

In retrospective reviews from France, Canada, and the United Kingdom, the median age of onset of JSLE was 12 to 13 years, with the disease developing in the majority of patients after eight years of age ***(Watson et al., 2012)***.

1- Geographic and Racial Distribution

Both geography and race affect the prevalence of SLE, clinical and laboratory manifestations and the disease appears to be more common in urban than rural areas ***(Chakravarty et al., 2007).***

The prevalence of SLE is higher among Asians, Afro-Americans, Afro-Caribbeans and Hispanic Americans compared with Americans of European decent in the United States, and among Asian Indians compared with Caucasians in Great Britain ***(Hochberg, 1985).***

2- Gender Distribution

The increased frequency of SLE among women has been attributed in part to an estrogen hormonal effect ***(Costenbader et al., 2007).***

Men with lupus tend to have higher frequencies of renal disease, skin manifestations, cytopenias, serositis, neurologic involvement, thrombosis, cardiovascular disease, hypertension and vasculitis than women. In contrast, Raynaud phenomenon, photosensitivity and mucosal ulceration are less frequent manifestations in men than women. Most, but not all studies suggest that men have a higher one-year mortality rate ***(Lu et al., 2010).***