Prevalence of glomerular diseases in Ain Shams University Hospitals

Thesis

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Internal Medicine

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Yasmin Mohamed Khalid Albadawi

List of Abbreviations

ACE : Angiotensin-converting enzyme
AGN : Acute endocapillary glomerulonephritis
AKI : Acute kidney injury
ANCA : Antineutrophil Cytoplasmic Antibodies
Anti-GBM : Anti glomerular basement membrane
Anti-PLA2R: Anti phospholipase A2 receptor.
ARBs : Angiotensin II receptor blockers
AP : Alternative pathway
AZA : Azathioprine
CFB : Complement factor B
CKD : Chronic kidney disease
CP : Classical pathway
CYC : cyclophosphamide
DDD : Dense deposit disease
DM : Diabetes mellitus
eGFR : Estimated glomerular filtration rate
EM : Electron microscopy
ESRD : End-stage renal disease
FSGS : Focal segmental glomerulosclerosis
GBM : Glomerular basement membrane
GC : Glucocorticoids
Gd-IgA1 : Galactose deficient IgA1
GN : Glomerulonephritis
GP : Good pastures disease
HBV : Hepatitis B virus
HCV : Hepatitis C virus
HCV : Hepatitis C virus
HTN : Hypertension
IF : Immunofluorescence microscopy

List of Abbreviations (Cont.)

IFN : Interferone
Ig : Immunoglobulin
IgAN : Immunoglobulin A nephropathy
IP : Immunoperoxidase
KDIGO : Kidney Disease Improving Global Outcomes
KDOQI : Kidney Disease Outcomes Quality Initiative
LM : Light microscopy
LN : Lupus nephritis
MAC : Membrane attack complex
MCD : Minimal change disease
MGN : Membranous glomerulonephritis
MIg : Monoclonal immunoglobulins
MMF : Mycophenolate mofetil
MPGN : Membranoproliferative glomerulonephritis
MPO : myeloperoxidase
NFKB : Nuclear factor Kappa light chain of activated B cells
ANCA : anti-neutrophil cytoplasmic antibody
NETs : Neutrophil extracellular traps
PR3 : Proteinase 3
PLA2R :Phosoholipase A2 receptor
PSGN : Post-Infectious GN
RPGN : Rapidly progressive glomerulonephritis
SLE : Systemic lupus erythematosus
SRNS : Steroid resistant NS

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Abstract

Introduction: Glomerulonephritis (GN), is a mass term used for a substantial number of diseases with the common denominator of histological renal inflammation emerging from the glomerular tuft, it is the second most common cause of chronic renal failure. GN is a major cause of morbidity and mortality from renal disease in many parts of the world, particularly in the tropical and subtropical regions. According to several local registries and sporadic publications, it is responsible for about23.2 to 58.4% of patients on regular dialysis in the tropics, compared to contemporary areas of around 16-18% in the United States and 9-15% in Europe. It is responsible for 16.6%which has been reported in 1998 in Egypt.

Aim of the Work: To study the Histologic spectrum of glomerular diseases among Egyptian patients in Ain Shams university hospitals for a period of 3 years from 2011 to 2013 with its correlation with the clinical and laboratory parameters (Single center).

Subjects and Methods: A cross sectional retrospective study was done in pathology lab and EM lab of Ain Shams University specialized Hospitals referral center from different governorates in Egypt. We studied all clinical cases with glomerular diseases diagnosed with renal biopsies over a period of 3 years from 2011 to 2013.The study included 857 renal biopsies evaluated by LM, EM, IF.

Results: This is a retrospective study aimed at data collection in three years from 2011 to 2013 in Ain Shams university hospitals. The study included 857 renal biopsies, cases 2011: 163 (19%), 2012: 349 (40.7%) and 2013:345 (40.3%) with mean of age 31.35±18.43 years and range (3-81) years. Children <16 years: 241 (28.3%), adults (17-60years): 548 (64.2%), elderly >60 years: 64 (7.5%). 386 (45%) of total cases were females and 471 (55%) were males, co morbidities as hypertension in (22.9%) of cases followed by DM (5.6%) of studied cases.

We recorded that 196 patients were presented by hypertension and the most common pathological diagnosis associated with HTN is FSGS in (18.4 %) followed by membranoproliferative glomerulonephritis in (16.8 %): The most common pathological diagnosis in nephrotic syndrome is minimal change disease followed by membranous glomerulonephritis; In asymptomatic proteinuria is lupus nephritis followed by membranous glomerulonephritis; In CKD is FSGS followed by global glomerulo-sclerosis ; In hematuria is IGA followed by Alport syndrome; In nephritic is membranoproliferative followed by FSGS; In RPGN in crescentic followed by lupus nephritis; AKI in lupus nephritis followed by membrano-proliferative; Nephrotic nephritic in diffuse proliferative followed by membranoproliferative.

Keywords: FSGS: Focal segmental glomerulosclerosis; GN: Glomerulonephritis; MPGN: Membranoproliferative glomerulonephritis

Introduction

Glomerulonephritis (GN), is a mass term used for a substantial number of diseases with the common denominator of histological renal inflammation emerging from the glomerular tuft, it is the second most common cause of chronic renal failure ***(Segelmark and Hellmark, 2010).***

GN is a major cause of morbidity and mortality from renal disease in many parts of the world, particularly in the tropical and subtropical regions. According to several local registries and sporadic publications, it is responsible for about23.2 to 58.4% of patients on regular dialysis in the tropics, compared to contemporary areas of around 16-18% in the United States and 9-15% in Europe. It is responsible for 16.6%which has been reported in 1998 in Egypt ***(Barsoum and Francis, 2000).***

In Syria, Moukeh et al reported that the prevalence of GN as a cause of ESRD is 20.5%, in Kwait GN was the first cause of ESRD by 32% ***(Zahran, 2011)***.

In United Kingdom GN is the first cause of ESRD by 16% in 2010 ***(Steenkamp et al., 2011)*** and 19% in 2014 (18th annual registry) ***(Macneil et al., 2016).***

Glomerular disease (GD) is one of the most common forms of renal diseases and can have many different clinical presentations. It can present as nephrotic syndrome (NS), nephritic syndrome, rapidly progressive renal failure (RPRF), acute kidney injury (AKI), chronic kidney disease (CKD), macroscopic hematuria (MH), recurrent disease in the post-

transplant kidney, as well as isolated proteinuria or hematuria ***(Golay et al.,2013)***.

Immune mechanisms are responsible for glomerular injury in most cases of primary glomerulonephritis and many of the secondary GN ***(Segelmark and Hellmark, 2010).***

Biopsy registries can give an idea about the regional variations in the spectrum of GD as well as the trend over time, however, there is a variation in the prevalence of the type of GD according to geographical location and race of the study population ***(Jennette et al., 2013)***.

The pattern of glomerular disease is different in various countries, and is changing with time within the same country. For instance, minimal change disease (MCD) was the most common cause of glomerular disease in Northern India, primary IgA nephropathy (IgAN) was more common in young adults from Western India, and mesangioproliferative glomerulonephritis (MesGN) was the predominant disease in South India ***(Pesce and Schena, 2010).***

There is also a changing pattern of the incidenceof GN in the different parts of the world. For instance, the incidence of end-stage renaldisease (ESRD) as a result of focal segmental glomerulosclerosis (FSGS) has increased 11-fold in the past two decades in a recent US study ***(Ibrahim et al., 2012).***

Aim of the Work

To study the Histologic spectrum of glomerular diseases among Egyptian patients in Ain Shams university hospitals for a period of 3 years from 2011 to 2013 with its correlation with the clinical and laboratory parameters (Single center).

Chapter 1
Epidemiology, updated classifications and pathogenesis of glomerulonephritis

Epidimiology:

Identification of the profile of glomerular disease in a certain geographical region is very important academically, clinically and epidemiologically. It helps in the identification of specific risk factors and for adequate prevention ***(Barsoum and Francis, 2000).***

Racial factors is also very important, not only in the incidence, but also it define the pattern, severity and progression of the glomerular disease, environmental factors may also be involved as modifiers of the glomerular pathology in different geographical regions, of particular interest is the role of heavy metal and hydrocarbon pollution, the epidemiological significance of which remains to be elucidated. For these reasons, it is of considerable interest to identify the patterns of glomerular disease in specific regions ***(Barsoum and Francis, 2000).***

GN varies in incidence among the different geographical areas due to socioeconomic conditions, ethnicity, genetic variability and environmental factors. Recent studies suggested a changing pattern of incidence of GN in the different parts of the world ***(Ibrahim et al., 2012).***

IgAN was the most common primary GN in young adults Caucasians (Europe and USA) ***(Zaza et al., 2013)***, and some countrieis in Asia as described in reports from China, Japan and Korea, and is the most common cause of end-stage renal disease