ORIGINAL ARTICLE

Histopathological Pattern of Primary Glomerulonephritis - A Single Center Experience

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Abstract:

Glomerulonephritis is the most common cause of chronic kidney disease in our country like in other developing countries. The incidence and histological pattern of primary GN in our countare is inadequately described. This cross-sectional prospective study was conducted at the nephrology unit in Holy Family Red Crescent Medical College Hospital, a tertiary care teaching hospital in Dhaka, Bangladesh starting from January 2019 - December 2019 including all patients with suspected primary GN who underwent kidney biopsies. Total 35 biopsies were performed. M: F 1.3:1 .Mean age was 33.71+_12.2 yrs. Membranoproliferative GN (34.28%) was the most common cause followed by mesangioproliferative (22.85%), IgA nephropathy (17.14%), membranous (11.42%), FSGS (11.42%) and minimal change disease (2.8%). Among 35 cases, 20 had proliferative verity. In immunofluroscence study, 19 had mild to marked deposits of immunoglubulin. 5.71% had post-biopsy complication which was not significant enough.

As the sample size was small so needs more studies in large to get the specific epidemiological patterns of primary GN.

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Introduction:

Glomerulonephritis is a common cause of chronic kidney disease worldwide. It may be primary or secondary in etiology. Thus the pattern of glomerulonephritis varies from country to country, reflecting the effects of genetic, socioeconomic. and environmental factors[1]. The disease spectrum is also been changing over the last few decades. IgA nephropathy is the commonest primary glomeruloneph in Asia. as well as in white Europeans and Americans[2-5]. In contrast, focal segmental glomerulosclerosis (FSGS) is the commonest glomerular disease among African - Americans, South Americans and in the middle east[6,7]. Currently, we do not have a central biopsy registry in Bangladesh. Statistics of prevalence of glomerular disease in Bangladesh are limited. In light of the paucity of published data from our country, this study was done to describe the histopathological pattern of primary glomerular disease at Holy Family Red Crescent Medical College Hospital.

Materials and method:

This was a hospital based cross-sectional observational study. Study period 01(one) year (January 2019- december 2019). Total 35 suspected cases of primary glomerulonephritis were included in this study and native kidney biopsy was done under local anesthesia at department of nephrology in HFRCMCH.

We recorded the demographic of cases, indication of renal biopsy, histopathological diagnosis, relevant laboratory investigations and post biopsy

complications.

Suspected case of primary glomerulonephritis with proteinuria > 1gm/day and/or persistent haematuria after excluding the possible causes of secondary glomerulonephritis.

Kidney biopsy was performed for all selected patients using 16-G automated biopsy needle. At least two cores of tissue were taken from each patient for light microscopy and direct immunofluroscence study.

Samples were fixed in 10% formalin solution and stained with hematoxylin and eosin and periodic acid schiff (PAS) for light microscopy. The other sample was preserved in normal saline for direct immunoflurescence (DIF) study.Immunoglobulins- IgG, IgM, IgA, also complement C1 and C3 were stained. Electron microscopy was not available for diagnostic purpose in our country.

Histopathological types of primary glumerulonephritis(PGN) were classified as follows- membranoproliferative glomerulonephritis (MPGN), messengio proliferative glomerulonephritis (MesPGN), Immunoglobulin A nephropathy (IgA), Focal segmental glomerulosclerosis (FSGS), Membranous Nephropathy (MN)and Minimal change disease (MCD).

Cases were further classified into proliferative GN and non proliferative GN .

All data were noted into a specially designed questionnaire and were analyzed using statistical package for social sciences (SPSS) version 20 computer software. Results were expressed as median or mean with standard deviation for continuous data and as frequencies with percentage for categorical data.

Results:

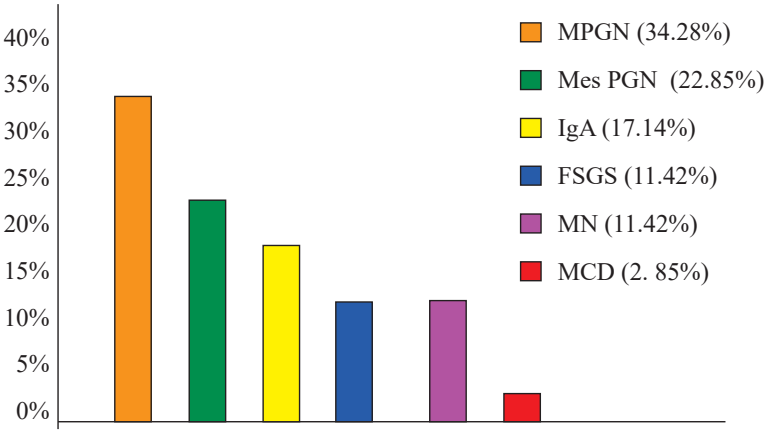
Out of 35 cases twenty cases were male (57.14%) and fifteen cases were female (42.85%). Male: Female was 1.3:1. Mean age33.71±12.2 (13-60). The majority of study subject were in the age group of 21 - 30 years.

Membranoproliferative glomerulonephritis (MPGN) was the commonest form of primary GN followed by messangioproliferative glomerulonephritis (MesPGN, Fig 1). No specific pathological pattern were found in any age group. (Table I)

The cases were also classified as proliferaitve (20) and non proliferative GN (15) (Table II)

There was male predominance in all disease categories except in membranoproliferative glomerulonephritis where eight out of twelve case (66.66%) were female.

Post biopsy bleeding occurred in two cases (5.71%). No case required blood transfusion or nephrectomy.



Primary GN 35 (100%)

Figure - 1: Histological pattern of primary glomerulonephritis

Table I: pathological pattern of PGN in different age group (n-35)

Diagnosis	10 -20	21 - 30	31 - 40	41 - 50	51 - 60
(no of cases)	yrs(n =5)	yrs(n=15)	yrs (n = 7)	yrs (n=4)	yrs (n=4)
MPGN(12)	2	4	2	2	2
MesPGN (8)	1	3	2	1	1
IgA (6)	2	2	1	1	0
FSGS (4)	0	2	1	0	1
MN (4)	0	3	1	0	0
MCD (1)	0	1	0	0	0

Table II: proliferative and non proliferative classification of PGN

Proliferative (n=20)	Non prolifentive (n=15)
MPGN (12)	MN (4)
MesPGN (8)	IgA (6)
	FSGS(4)
	MCD(1)

Discussion:

The majority of study subject who underwent renal biopsy were in the age group of 20-30 years but no distinct pathological pattern observed. in any age group. Mundi I et al[8] found most of cases were in 21 - 40 yrs age range and distinct pattern of PGN was found in different age group. The age range of our cases was 16-60 years with a slight male predominance (1.3:1) except in cases of MPGN. Most of the studies shows male predominance [9,10,11] with exception of Habib M A[12] from Bangladesh.

In the current study MPGN is the commonest primary GN seen. In most studies from Bangladesh MesPGN was found to be the commonest primary [14] and proliferative GN[13] though another study from Bangladesh found Focal segmental proliferative GN (29.47%) as the commonest entity.[12]

In our study MesPGNwas found second most common cause of primary GN . A study on global evolutionary trend of GN done in Singapore for three decades stated that in the first decade most Asians countries had mesPGN and MPGN are the common pattern of primary GN and still it is prevalent in some Asain countries like China, Japan and Thailand.1 Apart from geographical, genetic and socioeconomic factor, one facto which may influence the pattern of glomerulonephritis in various countries could be the hygeine hypothesis [15] The hygeine hypothesis proposes that bacterial and other infections occuring in less developed and developing countries leads to development of some type of human glomerulonephritis, including MPGN and MesPGN. This would be true in Asian countries like China, 16 Indonesia 27, Malaysia 18, Thailand 19, and Singapore14 which have a high prevalence of MPGN and MesPGN. In some countries like Malaysia 18 and Singapure14 prevalence of MPGN and MesPGN is already decreasing in keeping the urbanization and better housing and other amenities in these countries. Bangladesh is a rising country in context of urbanization and other fields of development, i.e, this hypothesis can explain the majority of MPGN and MesPGN in our study. Chugh KS also found high prevalence of MPGN and MesPGN in India [20] but Golay V et al found lower incidence (0.6%) in a recant study [21] which does not match our findings and we could not explain that.Our study findings regarding IgA Nephropathy (17.14%) is compatible with finding in other Asian countries[11].

It is the most common from of primary GN in Asia, accounting for up to 30 - 40 % of all biopsies, for 20% in Europe and for 10% in north America. 22

Our study finding regarding focal segmental glumerulosclerosis (FSGS) (11.42%) and membranous nephropathy (MN) (11.42%) nearly identical with Habib MA[12] which showed FSGS was (11.53%) and MN (7.37%). Mundi I et al and Mannan R et al[8,11] demonstrated. FSGS, MN and mininal change (MCD) are the commonest from of primary GN in India. Data from Singapore and other countries also showed that the prevalence of FSGS and MN have become increased in recent years.

The overall frequency of important complications after renal biopsy varied from 5% to 13% in previous reports.[23] which mainly included hematuria as in our study. No death or even nephrectomy was observed. This complications may be minimized in future by performing biopsy under USG/CT guidance.

Limitation of the study:
Small sample size of a single centre is the key limitations. A large number of study subjects from multi centre and availability of electron microscope could make our study more representative.

Conclusion:

To conclude, from the study and data analyzed the prevalence of GN is different all over the world due to various factors. Membranoproliferative and mesangioproliferative GN are more common in our country. whereas MN, MCD, FSGS and IgA nephropathy is not very prevalent. Renal biopsy is a safe procedure in expert hand. It also been realized that it is essential and necessary to maintain a control biopsy registry with as increased participation of many more nephrology centre. That will give us more accurate information about incidence, prevalence and distribution of glomerulonephritis in our country.

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