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2001 6



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.	.....	3
.	.....	5
1.	.....	5
2.	.....	5
가.	.....	5
.	.....	7
3.	.....	7
4.	.....	7
.	.....	8
1.	.....	8
가. B		
	.....	8
.	.....	8

.	.....	9	
2.	.....	12	
3.	B	.....	13
4.	B	.....	14
가.	.....	14	
.	/	.....	15
.	.....	16	
.	.....	17	
.	.....	18	
.	.....	23	
.	.....	25	
.	.....	28	

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B

	B	(HBV)	5 - 10%	HBV가
HBV		. HBV		
가			HBV가	, HBV
			HBsAg	
HBsAg		가		
			HBV	
	B			
	B			
	HBV			
	1985	2000	6	
		HBsAg		26
1.	26		31.0 ± 12.3	4.2:1
2.	26		가	
		14		
3.	B	26	IgA	7 (27.0%),
		1 (3.8%),		9 (34.6%)
		9 (34.6%)		

4. B 가 가 .

5. HBeAg 17 IgA 4  
 (23.5%), 8 (47.1%)  
 5 (29.4%) 가 .

6. (hepatitis activity index)가 IgA  
 가  
 (p=0.011 , p=0.039).

7. IgA  
 가  
 (p=0.011, p=0.003).

8. C3 24 C4

9. IgA IgA C3가 IgG C3가  
 B 가  
 가  
 HBeAg  
 , C3가  
 IgG C3  
 HBeAg, IgG C3 .

---

: B , , ,

B

<

>

HBsAg ,  
 5 - 10% 90 1990 5%  
 1. 0.2 - 1% , 0.2% 2.  
 HBV가 (HBV) HBV  
 B 가  
 3. B ,  
 HBV  
 HBsAg, HBeAg HbcAg  
 4. 가  
 - -  
 HBV  
 (membranous  
 glomerulonephritis), (membranoproliferative

glomerulonephritis),  
proliferative glomerulonephritis)

6,7

HBV

가

B

B

가

,

8

가

HBsAg

HBV

,

HBV

(mesangial

5.



**Table 1. New histopathologic classification of chronic hepatitis**

Grading of chronic hepatitis		score
Lobular activity		score
None	No necrosis	0
Minimal	Sinusoidal lymphocytosis +/- * 1 or less necrosis per 10 x objective field	1
Mild	2 - 5 necrosis per 10 x objective field	2
Moderate	6 - 10 necrosis per 10 x objective field	3
Severe	More than 10 necrosis per 10 x objective field, or confluent necrosis(zone 3)	4
Porto - Periportal activity		score
None	<mild portal inflammation	0
Minimal	>mild portal inflammation +/- focal piecemeal necrosis in a few portal tract	1
Mild	PMN <sup>†</sup> , focal in some or most portal tracts, or PMN < 50% in a few portal tracts	2
Moderate	PMN, around < 50% in most portal tracts, or PMN, around > 50% in a few or some portal tracts	3
Severe	PMN, around < 50% in most portal tracts / Septal surfaces, or bridging necrosis	4
Staging of chronic hepatitis		score
No fibrosis	Normal connective tissue	0
Portal fibrosis	Fibrous portal expansion	1
Periportal fibrosis	Periportal fibrosis with short septa extending Into lobules or rare porto - portal septa (intact architecture)	2
Septal fibrosis	Fibrous septa reaching adjacent portal tracts and terminal hepatic venule (architectural distortion but no obvious cirrhosis)	3
Cirrhosis	Diffuse nodular formation	4

\* with or without

† piecemeal necrosis

.  
IgA ,  
(minimal change nephrotic syndrome), (membranous  
glomerulonephritis) (membranoproliferative  
glomerulonephritis)

3.

B ,

4.

SPSS(Window release 9.0) Package

95%

가

Mann - Whitney U -

1.

가. B

1985 2000 6

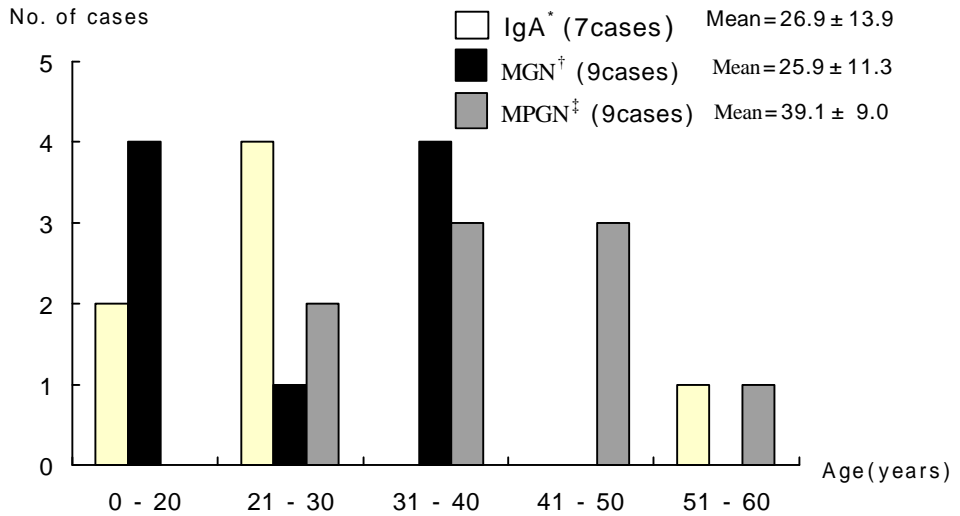
26  
, HBV

27%, 1 3.8%  
9 34.6%

HBsAg  
IgA 7  
가 가 .

8 56 31.0 ± 12.3  
가 21 , 5 4.2:1 .  
, 1 가 34 ,  
25.9 ± 11.3 가 10  
30 . 39.1 ± 9.0  
가 30 - 40 가 , IgA  
26.9 ± 13.9 20 (Figure 1).





- \* IgA Nephropathy
- † Membranous glomerulonephritis
- ‡ Membranoproliferative glomerulonephritis

**Figure 1. Age distribution**

Table 2

가	26	14	44.4%	14	1	3.5g	4
(28.6%),				1 (7.1%),		IgA	5
(35.7%),				4 (28.6%)		26	
	26	16	AST	ALT가	가		
IgG, IgA, IgM	23				IgG	9	
	971.6 ± 539.7 mg/dl(		800 - 1600 mg/dl)		IgA		
4	가		299.8 ± 213.0 mg/dl(		70 - 400		
mg/dl)	, IgM	7	가		206.3 ± 140.5		

mg/dl( 40 - 250 mg/dl) .  
 C3, C4 24 C3 66.9 ± 20.7  
 mg/dl( 90 - 180 mg/dl) , C4  
 25.7 ± 10.7 mg/dl( 10 - 40 mg/dl) .  
 ASO titer 17 , RF 12  
 2 가 . ANA 17  
 , anti - dsDNA 14 .  
 LE cell 9 .  
 HBeAg 17 65.4% 17 IgA 4  
 (23.5%), 8 (47.1%)  
 5 (29.4%) 가 .

**Table 2. Laboratory findings in patients with HBV-associated nephropathy at the time of biopsy**

	IgA*	MCNS†	MGN‡	MPGN§	Total
Number of cases	7	1	9	9	26
Mean Age(Years)	27 ± 14	34	26 ± 11	39 ± 9	31 ± 12
Range(Age)	14-56	34	8-40	24-51	8-56
Sex(Male:Female)	4:3	1:0	8:1	8:1	21:5
<b>Urine</b>					
Proteinuria>3.5g/day	4/7	1/1	5/7	4/7	14/22
Hematuria	7/7	1/1	9/9	9/9	26/26
<b>Serum</b>					
Increased AST/ALT (> 34 IU/L)	3/7	1/1	7/9	5/9	16/26
Decreased IgG (< 800 mg/dl)	3/6	1/1	2/9	3/7	9/23
Increased IgA (> 400 mg/dl)	2/6	0/1	0/9	2/7	4/23
Increased IgM (> 250 mg/dl)	2/6	0/1	2/9	3/7	7/23
Decreased C3 (< 90 mg/dl)	6/6	1/1	9/9	8/8	24/24
Decreased C4 (< 10 mg/dl)	0/6	0/1	0/9	0/8	0/24
HBsAg	7/7	1/1	9/9	9/9	26/26
HBeAg	4/7	0/1	8/9	5/9	17/26
Anti-HBs	0/7	0/1	0/9	0/9	0/26
Anti-Hbe	3/7	1/1	0/9	3/9	7/26
Anti-HBc	7/7	1/1	9/9	9/9	26/26
HBV-DNA	1/1	Not check	4/4	Not check	5/5

\* IgA Nephropathy

† Minimal change nephrotic syndrome

‡ Membranous glomerulonephritis

§ Membranoproliferative glomerulonephritis

2.

Table 3

IgG가 13 , IgA 16 , IgM 12 , C3 15 , C4 10 , C1 7 , fibrinogen 10

IgA

IgA IgA C3가  
IgA가

IgG C3가  
IgA C3가

**Table 3. Immunofluorescent findings in patients with HBV-associated nephropathy**

Nephropathy	No. of cases	Site of deposition	IgG	IgA	IgM	C3	C4	C1	Fibrinogen
IgA	7	GCW*	1	0	0	1	0	0	0
		Mes†	0	7	4	6	3	1	3
		GCW+Mes	0/1	0/7	0/4	1/6	0/3	0/1	0/3
MCNS	1	Mes	0	1	0	0	0	0	
MGN	9	GCW	9	4	4	3	3	2	3
		Mes	1	0	2	1	1	1	2
		GCW+Mes	1/9	0/4	2/4	0/4	1/3	0/3	2/5
MPGN	9	GCW	2	3	3	3	4	2	1
		Mes	1	2	2	3	1	1	1
		GCW+Mes	0/3	1/4	1/4	1/5	1/4	0/3	0/2
Total	26		13	16	12	15	10	7	10

\* Glomerular capillary wall

† Mesangium

3. B

26 가 2  
 8 IgA 5 62.5%, 3  
 37.5% , 가 3 18 IgA  
 2 11.1%, 1 5.6%,  
 9 50.0%, 6 33.3% .  
 , 1 9 IgA 6  
 66.7%, , ,  
 1 11.1% . 2 17  
 IgA 1 5.8%,  
 8 47.1% (Table 4).

**Table 4. Histopathologic characteristics of nephropathy according to new histopathologic classification of chronic B-viral hepatitis**

Classification	Liver pathology		Renal pathology			Total
	Score	IgA	MCNS	MGN	MPGN	
Hepatitis activity index	0 - 2	5	0	0	3	8
	3 - 4	2	1	9	6	18
Fibrosis score	0 - 1	6	1	1	1	9
	2 - 4	1	0	8	8	17

4.

B

가.

26 가 IgA , ,  
7 , 9 , 9 .  
B 1.7 ± 1.0 , 2.9 ± 0.6  
, 2.0 ± 0.9 IgA  
가 (p=0.019, p=0.031)

(Figure 2).

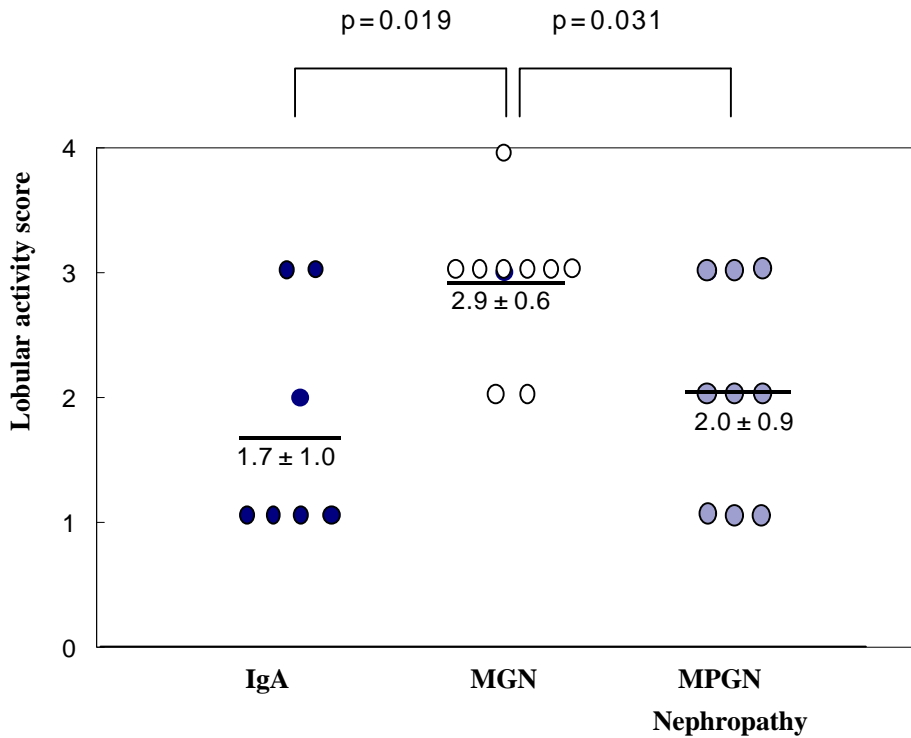
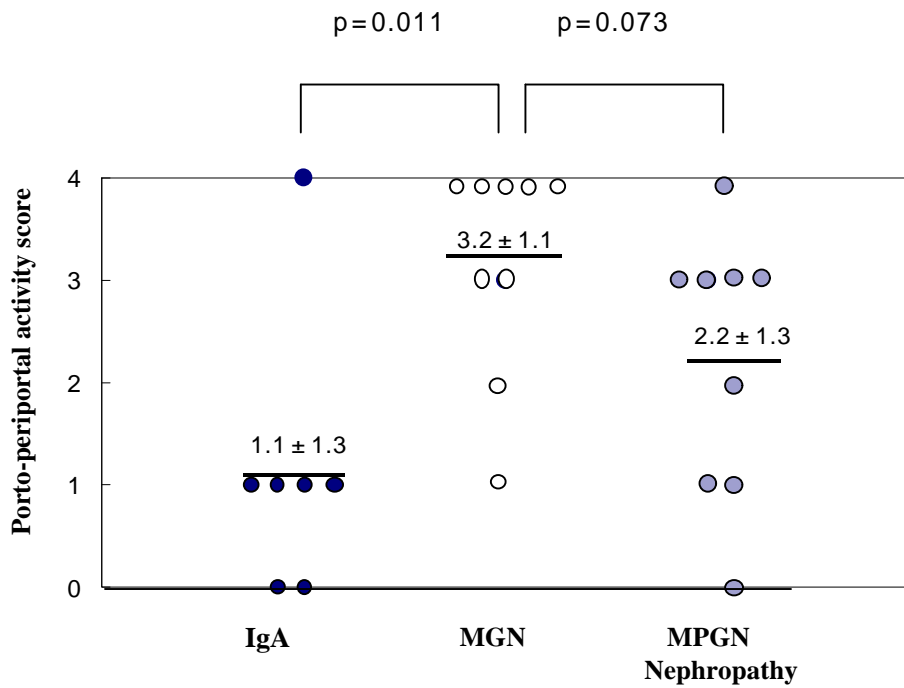
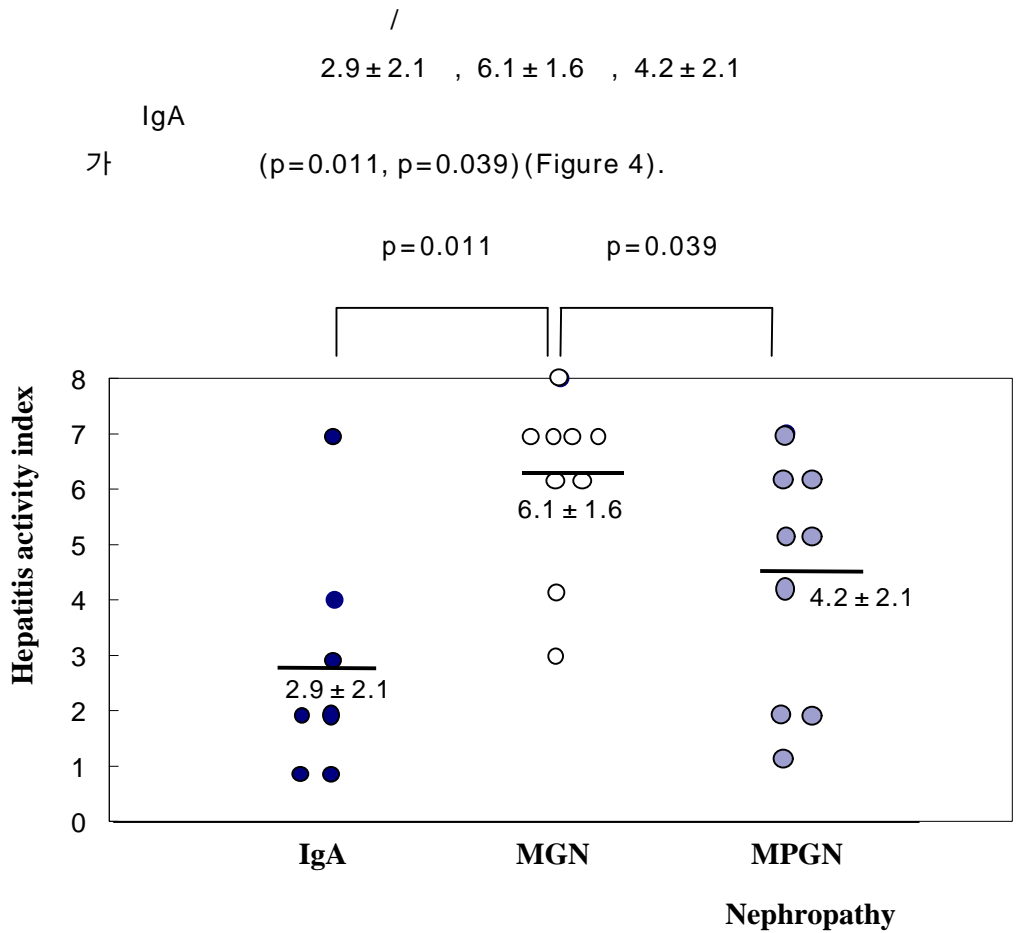


Figure 2. Lobular activity score according to histopathologic classification of nephropathy

. /  
 / 1.1 ± 1.3 , 3.2 ±  
 1.1 , 2.2 ± 1.3 IgA  
 가 . (p=0.011, p=0.073) (Figure 3).



**Figure 3. Porto-periportal activity score according to histopathologic classification of nephropathy**



**Figure 4. Hepatitis activity index according to histopathologic classification of nephropathy**





B

5 33 B

15 가 12 , 2 가

4 . 10 39

B 33 가 , 20 가

26

가 14 (53.8%) 1 3.5g 가

HBV

1971 Combes 11

(posttransfusion hepatitis) 16 53

Australia IgG

HBV

가

B 가

1979 Morzycka Slusarczyk<sup>12</sup> , 99

, HBsAg 55 28 가

, 16 HBsAg

, HBsAg 44 4

HBsAg HBV가

HBV

가 ,

HBV . Vos

<sup>13</sup> 9.8% 20.3%, Nagy <sup>14</sup> 0.99%

13%, Manna <sup>15</sup> 4.2% 31.7% , <sup>16</sup>



B  
 B  
 가  
 . Knieser <sup>21</sup> 3  
 , ,  
 . <sup>20</sup> 5  
 4 , 1 가  
 1 . <sup>5</sup>  
 B , 1  
 , 5 4 ,  
 1 가 .  
 가  
 가 26  
 . 26  
 가  
 가  
 가  
 1983 Amemiya <sup>22</sup> , B  
 HBsAg HBeAg , HBeAg  
 epithelial area , HBsAg  
 endothelial area mesangium .  
 HBeAg 10 daltons , HBeAg - Ab 100  
 daltons subepithelial area  
 HBsAg - Ab 200 daltons  
 subepithelial area  
 subendothelial area mesangium ,  
 HBeAg , HBsAg  
<sup>23</sup> . HBeAg  
 17 65.4% 8 (47.1%) 가  
 . HBeAg

가 C3 24 B C4 C3  
 가  
 IgA B  
 Lida<sup>24</sup> IgA 130 HBsAg 4  
 (3.1%) 4 1 HBeAg  
 4 HBsAg HBeAg  
 HBsAg, HBeAg IgA  
 , Nagy<sup>14</sup> 가 HBsAg  
 0.99% IgA HBsAg 16%  
 HBsAg 31%  
 , Lai<sup>25</sup> 122 IgA 17.2% HBsAg  
 HBsAg  
 HBsAg HBcAg  
 HBV가 IgA  
<sup>26</sup> 736 IgA  
 66 9% 87 HBsAg  
 IgA 16 (17%) IgA  
 26 7 (27%) HBV가  
 IgA C3가  
<sup>26</sup>  
 , B 25.9  
 ± 11.3 , 41.3 ± 13.5  
 , 39.1 ± 9.0  
 32.5 ± 14.5  
 B  
 , HBeAg  
 , HBsAg

가 ,  
HBeAg C3가  
IgG C3  
HBeAg, IgG C3  
가 .  
IgA  
가 .

HBV

HBV

가

HBV

, B B

HBV

1985 2000 6

HBsAg 26

1. 26 31.0 ± 12.3 4.2:1

가

14

2. B 26 IgA 7 (27.0%), 9 (34.6%), 1 (3.8%), 9 (34.6%)

3. B 가

가

4. (hepatitis activity index)가 IgA 가

(p=0.011, p=0.039).

5. IgA 가

(p=0.011, p=0.003).

6. HBeAg 17 8  
 (47.1%) 가 IgG C3가  
 B 가  
 가  
 HBeAg  
 , C3가  
 IgG C3  
 HBeAg, IgG C3



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2000;  
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(HBsAg) Anti - HBs . . . . . 1982;25:750 - 6.
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Abstract

## Histopathologic Correlation between Chronic B Viral Hepatitis and Nephropathy

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(Directed by Professor Chae Yoon Chon)

Recent evidence indicates that B-viral hepatitis is sometimes associated with the production of extrahepatic tissue injury. However, the pathologic role of the HBV infection for glomerulonephritis is not clear. There were some reports on clinical association between HBV infection and nephropathy. The relationship between HBV infection and nephropathy was reported with some differences according to the investigators and regions. Liver biopsies were not performed in most of the reports. However, in this study both liver and kidney biopsies were performed in all patients who were HBsAg positive and had proteinuria and hematuria. And, the histologic correlation was analyzed between chronic B viral hepatitis and nephropathy. Also, new histopathologic classification of chronic hepatitis was applied in the assessment of liver disease.

From January 1985 to June 2000, 26 patients who were HBsAg positive and had proteinuria and hematuria were examined.

1. Among 26 cases, the mean age was  $31.0 \pm 12.3$  years and the ratio of male to female was 4.2 to 1.

2. Light microscopy of kidney showed IgA nephropathy in 7 cases(27%), minimal change nephrotic syndrome(MCNS) in 1 case(3.8%), membranous glomerulonephritis(MGN) in 9 cases(34.6%), membranoproliferative glomerulonephritis (MPGN) in 9 cases(34.6%).
3. Among cases with hepatitis B virus, in cases with higher hepatitis activity index and fibrosis score, the frequency of MGN and MPGN was higher.
4. The hepatitis activity index of cases with MGN was significantly higher than IgA nephropathy and MPGN( $p=0.011$ ,  $p=0.039$ ).
5. The fibrosis score of cases with MGN and MPGN was significantly higher than IgA nephropathy( $p=0.011$ ,  $p=0.003$ ).
6. Seventeen cases were positive for HBeAg and nine cases were negative. The positivity of HBeAg was highest in cases with MGN.
7. Serum C3 level was low in all cases, but serum C4 level was within normal range.
8. Immunofluorescence studies showed granular deposition of IgG and C3 in the capillary loops in MGN.

In conclusion, the frequency of MGN and MPGN was higher when the liver disease was more severe, and it was suggested that HBeAg, IgG and C3 might contribute to the pathogenesis of MGN in HBsAg positive patients.

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Key Words : Hepatitis B - virus, Nephropathy, Liver biopsy,  
Renal biopsy