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## Demographic Factors Influencing Hepatitis B infection towards Bad Prognosis in a Sample of Iraqi Patients

Maysaa K. AL-Malkey

Lina Talal

Istabreq Abudel Al-Hadi

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### Abstract

**Objective:** This study was design to identify the predisposing factors affecting patients with hepatitis B towards chronic infection and bad prognosis such as chronic liver disease, liver cirrhosis and death.

**Patients & Methods:** Data were collected from records of Digestive System and Liver Diseases Teaching Hospital in Baghdad about patients infected with HBV as well as basic demographic data, statistical analysis was performed using Chi-square test.

**Results:** The infection rate was increased from 3% in 2001 to 35% in 2004 but the case-fatality rate was decreased from 40% in 2001 to 22% in 2004. The chronic liver disease recorded 72.5% and the liver cirrhosis recorded 5.5%.

**Conclusion:** The early diagnosis of the disease and presence of medical professionals (gastroenterologists and hematologists) lead to minimize further bad prognosis which result in minimizing the deaths of patients in spite of increasing the rate of the disease in the few past years.

**Key words:** HBV, chronic liver disease, liver cirrhosis, bad prognosis

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### Introduction

Hepatitis B virus (HBV) is a double-stranded deoxyribonucleic acid (DNA) containing virus belonging to the class *Hepadnaviridae*. HBV is the cause of serum hepatitis. HBV establishes chronic infections, especially in those infected; it is a major factor in the eventual development of liver disease and hepatocellular carcinoma (HCC) [1].

The virus replicates primarily in hepatocytes, releasing into the circulation hepatitis B surface antigen (HBsAg), HBeAg, and intact virions containing HBV DNA. There is also evidence that HBV replicates in extra hepatic reservoirs, even though at a lower level. These cell types include peripheral mononuclear cells, macrophages, intestinal epithelium, and other organs [2].

According to World Health Organization statistics, hepatitis B induced cirrhosis or liver cancer is the ninth most common cause of death worldwide, taking more than 1 million lives each year [3]. Major routes of transmission among adults is by percutaneous and mucous membrane exposure to infected bodily fluids, such as serum, semen, and saliva meanwhile, perinatal transmission from mother to child are the major sources of chronic HBV infection in endemic regions [4].

The incubation periods were about 45 to 160 days, with an average of 120 days. The risk of developing chronic HBV infection is inversely related to age at the time of infection. Fewer than 10% of infected children and infants present with symptoms of disease, but the number increases to more than 30% in adults above the age of 30 [5].

Patients who have evidence for persistent viral replication are more likely to develop exacerbations, cirrhosis, hepatic decompensation, death from liver failure, and HCC [6]. The rate of progression from chronic hepatitis to HCC ranges from 0.2% to 0.7% per year and from compensated cirrhosis to HCC from 0.2% to 8% per year [7,8]. The prognosis for patients with newly diagnosed HCC with one year mortality rates as high as 80% [9]. One quarter of all patients with chronic HBV will die prematurely of HCC or cirrhosis [4].

The aim of the study is to identify the predisposing factor affecting the patients with hepatitis B towards chronic infection and bad prognosis such as chronic liver disease, liver cirrhosis and death.

### Patients & Methods:

- 1-The data were collected from records of Digestive System and Liver Diseases Teaching Hospital in Baghdad about patients infected with HBV from July 2001 to June 2005.
- 2-All patients were diagnosed by gastroenterologists and hematologists depending on clinical features, serological tests, liver functions tests, and cancer screening.
- 3-Additional information includes basic demographic data like (Patient's age, gender, residency, employment, date of hospital entry).
- 4-Statistical analysis was performed using Chi-square test and T-test for the significance association between different variables with  $P < 0.05$  as the level of significance.

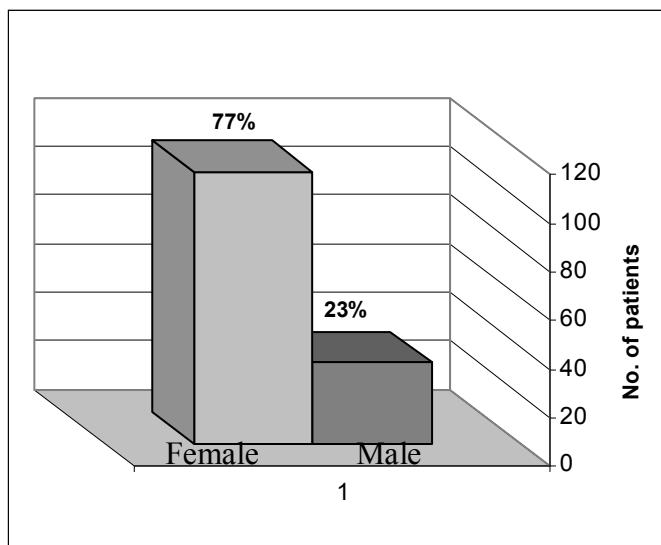
**Results:**

The number of patients were 145 which they required close supervision and repeatedly hospitalization because of their chronic infection with HBV. The predisposing factors that may effect on patients chronic infection towards bad prognosis were as follows:

**1. Age and Gender:**

The patients were 112 male represents 77% and 33 female represents 23% as shown in figure 1. The patients were divided into five age groups as

shown in table 1. The majority of patients belong to the third age group 41-60 years; they were 59 male patients and 15 female patients. There were no significant differences between the gender and the age group of the patients. The mean for male age was ( $x \pm SD = 50.84 \pm 15.55$ ) year and for female the mean of age was ( $x \pm SD = 51.42 \pm 20.10$ ) year. T-test=0.176; d.f. =143; P>0.05 there were no significant differences concerning the age mean for infection in both gender.



**Figure (1):** The male to female proportion

**Table 1:** The correlation between chronic HBV patients with age groups and gender.

Age Groups (years)	Total Patients		Gender			
			Males		Females	
	No.	%	No.	%	No.	%
1-20	7	4.8	3	2.7	4	12.1
21-40	28	19.3	24	21.4	4	12.1
41-60	74	51.1	59	52.7	15	45.5
61-80	30	20.7	21	18.8	9	27.3
81-100	6	4.1	5	4.4	1	3.0
Total	145	100.0	112	100.0	33	100.0
X2 = 7.134			P > 0.05 (Not Significant)			

**2. Year of infection:**

Over a five years data the numbers of patients infected with chronic HBV showed increment from only 5 patients represents 3% in 2001 to 50 patients in 2004 represents 35% as shown in figure 2.

**3. Case-Fatal Rate:**

The majority of patients in this study were diagnosed as chronic liver disease many cases were

shifted towards liver cirrhosis and HCC. The year 2001 and 2002 shows the same value concerning the mortality rate which recorded 40% in spite of the differences of patient's numbers. The following years 2003, 2004 showed increment of patient's numbers but also showed decrement in the mortality rate recorded 32%, 22% respectively. The

year 2005 showed decrement in both patients' numbers and the mortality rate recorded 13%. This increment may be due to incomplete data as shown in figure 3. The chi-square test value is=6.482 and  $P<0.05$

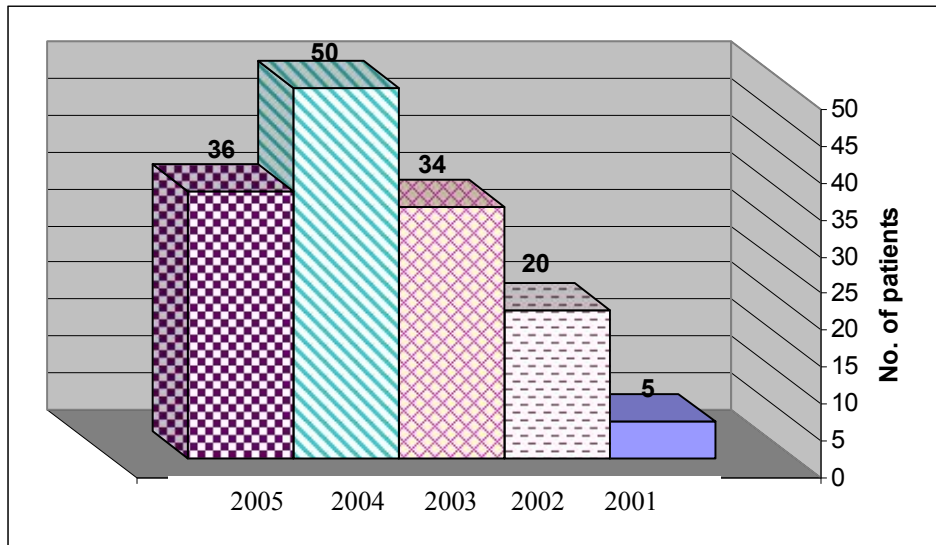


Figure (2): Numbers of patients with chronic HBV and the year of infection.

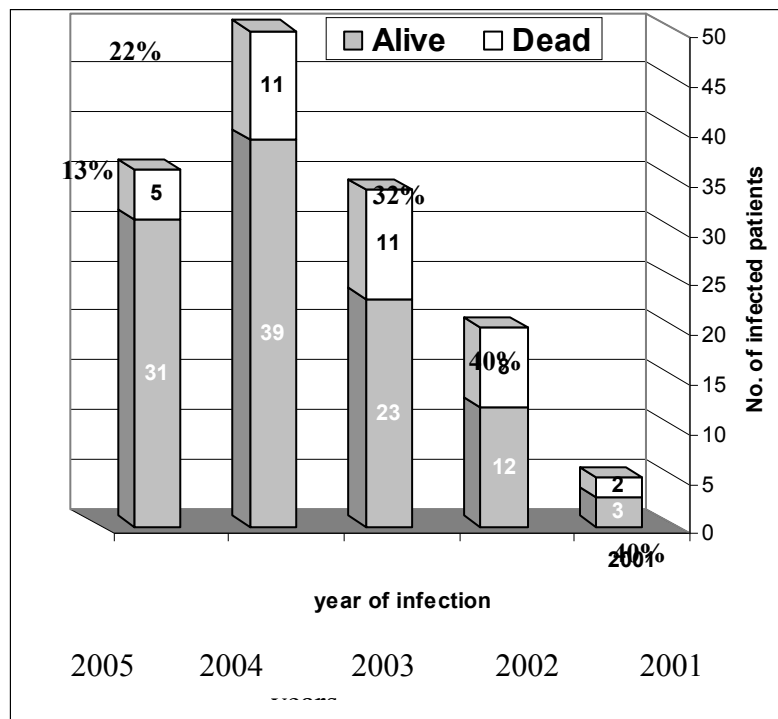


Figure (3): Mortality rate through each year occurrence.

#### 4. Age group and Case-Fatality Rate:

The rate of case fatality rate among age group (21-40) years was 18%, meanwhile in age groups (41-60) years and (61-80) years, the rates shows the

same value which was 30%. The case fatality rate in the age group (81-100) years recorded 17%. This difference is significant as shown in table 2.

**Table (2): The relation between patients' age groups and their status.**

Age group (Years)	Total patients		Status			
			Alive		Dead	
	No.	%	No.	%	No.	%
1-20	7	4.8	7	6.5	-	-
21-40	28	19.3	23	21.3	5	13.5
41-60	74	51.1	52	48.2	22	59.5
61-80	30	20.7	21	19.4	9	24.3
81-100	6	4.1	5	4.6	1	2.7
Total	145	100.0	108	100.00	37	100.00
Chi square value = 4.518			P< 0.05			

#### Discussions:

In the current study the male patients infected with HBV were higher than the female patients in all age groups. Of a total 145 patients over a five years period, 112 of them were males recorded 77%; meanwhile the female patients recorded 23%. Our findings are in agreements with a demographic study by Kutrani et al., (2007) on Libyan patients infected with HBV in which he found that the males were more affected (65%) than females (35%)<sup>[10]</sup>.

The males are genetically more predisposed than the females to develop hepatitis B infection and this regard the genotype of the virus plays some role in such predisposing as showed by recent studies<sup>[11, 12]</sup>

In our study, the adults (age group 41-60 years) are at the risk of infection with chronic HBV because they may catch the infection from blood transfusion, dental care (infected instruments), household infection (one partner is infected or a person live in the house is infected). Our findings are disagreement with Kutrani et al., (2007) results, which in his study showed that the younger patients and single patients were more prone to hepatitis B infection (mean age=28.5 year). The vast majority of them were working in the medical sectors and they may catch the infection from the infected needles during their work in the medical services and by not following the proper healthy standards and procedures in disposal of medical waste<sup>[10]</sup>.

In U.S.A the age group at risk is 15-40 year for many reasons like: drug abuse, active sexual behavior (multiple sex partners), medical personnel (handling with infected blood and blood products)

also 90% of infants at birth will become chronically infected with HBV, as will 25%-50% of children aged 1-5 years and 1%-5% of older children and adults<sup>[13]</sup>.

The year 2004 showed the highest rate of infection with viral hepatitis type B recorded 35%, the lowest rate recorded 3% was in 2001. The rate of infection with HBV increased with years, the low rate in 2005 because in complete data at that year. The year 2001 show the lowest rate because the hospital was recently established and most patients were from Baghdad but now the hospital serve most Iraqi governorate. This proportional increment can be explained that the presence of specialized hospital that deal with many of liver and digestive system diseases and presence of specialist doctors may lead transform most cases from other hospitals especially the chronic cases of HBV for more care, treatment and assessment of the cases to be hospitalized or for fellow up treatment.

The case-fatality rate recorded high rate in 2001 reaching 40% then showed a decrement over the following years until reaching 13% in 2005. The patient's status showed different patterns which revealed that chronic liver disease recorded the highest percentage followed by liver cirrhosis, HCC in which most of those patients will eventually die.

In a study by Lankarani et al., (1999)<sup>[14]</sup> showed that among 162 patients from Center for Liver Diseases in Shiraz, South of Iran and others in Iran (medical charts of all patients were reviewed), 56.2% of cases were positive to HBsAg and that HBV is a major cause of postnecrotic cirrhosis in

Southern Iran. As well as previous studies reported from the same center and other in Iran that revealed a high prevalence of HBV among patients with cirrhosis [15,16].

In a study by Okada et al., 1985<sup>(9)</sup> showed that the prognosis for patients with newly diagnosed HCC is depressive, though, with one year mortality rates as high as 80%. All told, upwards of one quarter of all patients with chronic HBV will die prematurely of HCC or cirrhosis [4]. Meanwhile the rate of progression from chronic hepatitis to HCC ranges from 0.2% to 0.7% per year and from compensated cirrhosis to HCC from 0.2% to 8% per year [7,8]. While HCC resulting from chronic hepatitis B is a major source of mortality worldwide, in the U.S., the disease is infrequently found.

In highly endemic areas, the lifetime risk of succumbing to complications (cirrhosis and HCC) has been estimated to be as 40%, whereas in low prevalence areas the risk of HCC in those with adult-acquired chronic hepatitis B is very low. To summarize: In the West, clinically apparent acute hepatitis B is usually a self-limited disease acquired in adulthood with a low rate of progression to chronicity, rarely, if ever, leading to HCC. In the East, hepatitis B is usually a chronic disease acquired at birth, associated with a high rate of progression to cirrhosis and cancer. The difference in natural course is mediated by the interaction between virus and host, which is largely determined by the age at which the infection is, acquired [4].

The improvement in diagnostic methods and presence of specialized hospital and medical professionals (gastroenterologists and hematologists) lead to the discovery many of chronic cases at early stage and the flow up of patients to minimize further progression and lower the rate of mortality.

#### Recommendations:

To accomplish the goals of conducting surveillance for hepatitis B, multiple types of surveillance activities are needed, including surveillance for acute hepatitis B, surveillance for perinatal HBV infection, and surveillance for persons who test positive for HBsAg to identify those with chronic HBV infections.

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**Tropical Biological Researches Unit / College of Sciences / University of Baghdad**