
Prevalence of Hepatitis B and/or Hepatitis C in 1 Haemodialysis Patients in Benghazi Renal Units

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Summary:

201 patients with end stage renal disease (ESRD) on maintenance haemodialysis (H.D) program, from 7th October and Hawari hospital renal units were studied for the prevalence of hepatitis B surface antigen (HbsAg) and or hepatitis C virus antibody (HCV Ab) by using the ELISA method (Hepanostika HbsAg uniform II Organon Teknika) which qualitatively detects HbsAg subtypes ad and ay, and (UBI HCV EIA 4.0, United biochemical Inc. USA). It consists of synthetic peptides which correspond to the highly antigenic segments of HCV core regions (NS3, NS4, NS5) to detect HCV antibody.

The study showed positive HbsAg results in 20 patients and positive HCV Ab in 133 patients and dual infections (HbsAg and HCV ab) in 23 patients with prevalence rates of 10%, 66.2% and 11.4% respectively. So the total prevalence rates for HbsAg and HCV antibody are 21% and 78% respectively.

This study recommends more urgent preventive medical measures to be taken to decrease the prevalence rates of hepatitis B and or C viruses in HID units.

Introduction:

Most of the patients with ESRD on maintenance H.D program, have a history of multiple blood transfusions, minor or major surgical operations either locally or abroad; so they are very liable to HBV and or HCV infections during their life.^{1,2}

This is likely to predispose these patients to consequent serious viral HBV and HCV complications,^{3,4} such as chronic hepatitis, liver cirrhosis, and or hepatocellular carcinoma, with the increased risk of virus cross infection in dialysis units.

The aim of this study is to estimate the prevalence rates of HbsAg and or HCV Ab in H.D patients and stress the value of preventive medical measures. This may eventually encourage more prospective studies in H.D patients, especially those with hepatitis B and or C positive results for early detection of any liver complications and some of these patients may benefit from Interferon therapy.⁶

Materials and Methods:

201 ESRD Libyan patients on maintenance H.D program were studied, 28 patients from 7th October hospital and 173 patients from Hawari hospital dialysis units. Universal precautions for infection control are routinely practiced in

our units e.g. no reuse of dialyser, thermal sterilisation of all dialysis machines is performed at the end of each dialysis session. Special dialysis machines are usually used for HbsAg positive patients in separate places in the haemodialysis units. Each machine is then subjected to both chemical and thermal sterilisation after each dialysis session. The patients' medical files were studied and analysed for age, sex, district, cause of ESRD, other medical diagnosis, duration of ESRD, duration of H.D treatment, history of H.D outside the patient's original dialysis unit (place & date) and number of H.D weekly sessions history of jaundice, blood transfusions, surgical operations locally or abroad (place & date) and drug history were also noted. Analyses of the patient's previous investigation results especially HbsAg and HCV Ab, liver function tests (LFTs), and abdominal ultrasound were performed. Each patient was physically examined for signs of chronic liver disease and venous blood samples were tested for the following: routine investigations, HbsAg test using ELISA method (Hepanostika HbsAg Uniform II) kits. HCV Ab test using ELISA method (UBI-HCV EIA 4.0) and L.F.Ts.

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Results:**Table 1: shows 201 ESRD patients details.**

Dialysis unit	Total		Male		Female	
	No.	%	No.	%	No.	%
7 th October hospital	28	14	14	50	14	50
Hawari hospital	173	86	102	59	71	41
Total	201	100	116	58	85	42

The duration of H.D treatment ranged from <2 weeks to 20 years, number of H.D weekly sessions ranged from 2-4 (average 3) each lasting 3-4 hours session and the patients age ranged from 16-77 years.

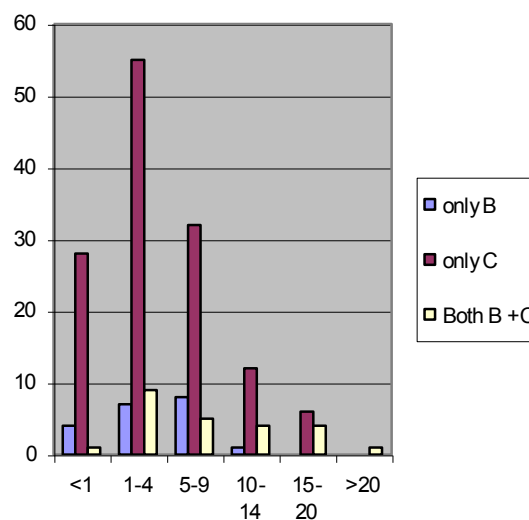
From a total (201) ESRD patients only 25 patients (12%) showed negative results for

both HbsAg and HCV Ab. They had normal LETs. The remaining (176) patients had positive hepatitis results. Table (2) shows the relation between the duration of H. D in years to the positive viral hepatitis cases, with total prevalence rates of 21%, 78% for HbsAg, HCV Ab respectively.

Table 2: Relationship between the duration of H.D in years and 176 positive viral hepatitis results of HbsAg / HCV Ab:

Duration of H.D in years	Hepatitis		Both +ve	Total
	Only B	Only C	HbsAg / HCV Ab	
<1	4	28	1	33
1 – 4	7	55	9	71
5 – 9	8	32	5	45
10 – 14	1	12	3	16
15 – 20	0	6	4	10
> 20	0	0	1	1
Total + ve	20	133	23	176
Percentage	10%	66.2%	11.4%	100%

Fifty-four patients of the total group (27%) had abnormal LETs, as noticed by increased serum levels of aminotransferases twice the normal value. Twenty of the patients (37%,) had positive HbsAg, and the remaining (34) patients (63%) had positive HCV Ab. All the patients (201) had a history of at least one unit blood transfusion and minor operations e.g arteriovenous fistula and 10 of them had major operations, during H.D treatment. Non of them had any history of hepatotoxic drug intake or signs of chronic liver disease. Only 14 patients of the total studied (201 patients) group were HbsAg +ve (not HbsAg carrier) and 12 patients had a previous history of mild jaundice before the start of haemodialysis treatment.

**Discussion:**

The overall prevalence rates of hepatitis B virus varied from near zero in parts of western hemisphere to over 15% in Asia and Africa.⁷ In some countries the prevalence rate has fallen dramatically in a few years with improved social, hygienic, educational

conditions and inclusions of HBV vaccine in the expanded program of vaccination (EPI).^{8, 9} This overall fall in HBV prevalence rate in recent years among other factors has decreased the overall prevalence rate of HBV infection in H.D patients. Other factors include: better

screening of the blood products, decreased patient's transfusion requirements due to the availability and use of erythropoietin, HBV vaccination, improvement in dialysis techniques, and minimizing the virus cross infection in dialysis units by practicing hepatitis precautionary rules.^{10,11} There is no recent available locally reported studies on the prevalence of HBV in H.D units for comparison with our results, except that of Prasad and co-workers on 1978¹² who had reported a prevalence rate of 5.19% for HbsAg and 24.7% for HBs antibody positivity respectively in Jamahiria hospital dialysis unit in Benghazi. This figure is lower than the total of 21% of HbsAg prevalence rate in our study. This discrepancy may be explained by the more sensitive method (ELISA) we have used and or to the larger sample size screened in this study or a genuine actual increase in HBV prevalence rate for many other reasons. One of those reasons was noticed and reported by El-Arbi and co-workers in 1994,¹³ when they reported a prevalence rates of 13%, 19%, 19% for HbsAg, anti-Hbc and anti-Hbs respectively having used additional HBV markers, other than HbsAg alone. We believe that HbsAg prevalence rate in this study is probably higher than 21% based on the assumption that accurate screening should be done by using additional HBV markers rather than HbsAg alone for two reasons. The first is the early disappearance of HbsAg from the patient's blood in the presence of HCV infection.^{14, 15} We have also noticed it in our study as shown by the higher HCV Ab prevalence rate of 78% compared to HBV prevalence rate of 21%. The second reason, if a HBV case is tested during the hepatitis incubation period or after the disappearance of HbsAg, both will give zero HbsAg prevalence rate.

There was only one reported local study about HCV prevalence rate in multiple blood transfused patients of 33% and patients with chronic liver diseases of 38%¹⁶ and no available local data for comparison in H.D patients. This study showed a total HCV Ab prevalence rate of 78%, in H.D patients which is slightly higher than that reported from Kuwait 71%¹⁷, and Saudi Arabia 51.1%¹⁸ and Tunisia 29.6%.¹⁹ The explanation of increased prevalence of HCV Ab rate in this study than that reported from Saudi Arabia, Kuwait and Tunisia may be due to the more sensitive method we have used/or HCV Ab detection or actual increase in HCV Ab prevalence rate in

our H.D patients. This needs more prospective studies to clarify it.

Co-infection with (HBV and HCV) was reported to occur frequently.^{20, 21} HBV and HCV infections share several modes of transmission. In this study 11% of the patients had both viruses. This figure might have been higher if we had used other HBV markers rather than HbsAg. These patients with dual virus infection need regular follow up and further investigations as they were reported to be more liable to severe liver diseases and eventually hepatocellular carcinoma.⁵

Fifty four ESRD patients (54/201) on H.D (27%) have increased liver enzymes (ALT, AST) up to twice the normal values with normal other liver parameters. These patients need further investigations e.g. other HBV markers, polymerase chain reaction (PCR) and possible liver biopsy as some of them may benefit from Interferon treatment

There are many conflicting reports about HCV-Ab positivity and ALT plasma levels. Most of the patients (85%) were reported to have normal ALT levels.⁴ while other patients were reported to have increased ALT level.²²

Twenty five patients (12%) in this study show negative HbsAg and HCV-Ab results with normal LFTs. These results may be true negative or false negative regarding HbsAg as some of them may have hepatitis during the incubation period or after the disappearance of HbsAg. They need further medical attention including regular screening for HBV and HCV, minimizing the blood transfusion requirements and the use of erythropoietin if needed.

Conclusion and recommendation:

This study shows high prevalence rates of HBV and or HCV infections in ESRD patients on H.D programme in Benghazi dialysis units. This is a major health hazard, as both viruses are potentially avoidable if hepatitis precautions rules are practiced strictly and regularly in our dialysis units, together with regular supply and use of erythropoietin to minimize blood transfusions risks. Increased medical knowledge about the routes of viral infection among both dialysis staff and patients by regular educational sessions can also help in avoiding this health hazard. Use of viral screening programs must include other HBV markers. Strict use of protective measures (suits, gloves, glasses... etc) and the available HBV vaccination for ESRD patients on H.D, their close relatives and renal dialysis staff

HGV Ab positive cases by ELISA, need further confirmation using PGR test and possibility of liver biopsy as some of them may need and benefit from interferon treatment.

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