Sociodemographic characteristics and risk factors of hepatitis B and C among Iraqi health care workers

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Summary:

Background: Many workers have described the prevalence of HBV markers and anti-HCV among selected populations including health care personnel in Iraq. The purpose of this study is to describe the demographic characteristics and risk factors of hepatitis B and C in a sample of Iraqi health care workers (HCWs).

Materials and methods: A total of 1656 HCWs selected from Baghdad city was included in this study. A questionnaire form was filled for each HCW by direct interview. The data requested included demographic characteristics and risk factors of exposure to HBV and HCV. HCWs were screened for the presence of HBsAg, anti-HBs and anti-HCV.

Results: A higher prevalence of HBsAg, anti-HBs and anti-HCV was demonstrated among males (7.8%, 44.7% and 2.13%, respectively) than females (3.3%, 34.8% and 0.99%, respectively). The HBsAg carrier rates were decreasing with advancing age, while anti-HBs and anti-HCV showed an increase with advancing age. A higher rate of HBsAg, anti-HBs and anti-HCV was detected among HCWs from low socioeconomic level than those from high socioeconomic level. Health personnel who had a personal history of hepatitis were more likely to be HBsAg positive than those without such a risk factor and HCWs with personal or family history of hepatitis were more likely to have anti-HBs than those without such risk factors. Health personnel with personal history of hepatitis or blood transfusion had significantly higher prevalence of anti-HCV when compared with those without such risk factors.

Conclusion: This study indicates that non-paranteral route is the major route of transmission of HBV infection, while paranteral route is the major route for transmission of HCV among the health personnel.

Keywords: Health care workers, HBV, HCV, Iraq

Introduction:

Viral hepatitis caused by HBV and HCV constitute a major economic and public health problem in the world 1. In Iraq, many workers described the prevalence of HBV markers and anti-HCV among selected populations including health care personnel 2, 3. The purpose of this of this report is to describe the demographic characteristics (sex and age variations and socioeconomic status) and risk factors of hepatitis B and C in a sample of Iraqi health care workers (HCWs).

Materials and methods:

A total of 1656 HCWs selected from various hospitals and health centers in Baghdad was included in this study. Their age ranged between 16 – 65 years with a mean 36.8 ± 12.4 years (35.8 ± 11.9 for males and 36.9 ± 10.8 for females) and male: female ratio of 0.83: 1.The study was carried out from June 1995 to April 1998, inclusive. HCWs with less than 6 months of professional practice and those who had received hepatitis B vaccine were excluded from the study. A questionnaire form was filled for each HCW by direct interview. The data requested included age, sex and risk factors of exposure to HBV and HCV which included personal history of hepatitis, blood transfusion, surgical procedures and frequent injections, family history of hepatitis and tattooing. The socioeconomic status of each individual was determined according to educational level of the person, residency, family income and crowding index. HCWs were screened for presence of HBsAg and anti-HBs by enzyme – linked immunosorbent assay (ELISA) and for presence of anti-HCV by a third generation enzyme immunosorbent assay (EIA) was confirmed by a third generation recombinant immunoblot assay (RIBA-111). Serum testing was carried out at the Central Public Health Laboratory, Baghdad using commercially available kits. Chi-square (χ 2), Yate's correction of chi-square and Odd Ratio (OR) and 95% confidence interval (95%CI) (logistic regression) were calculated for statistical analysis. P value less than 0.05 were considered as statistically significant.

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Results:

There was a higher prevalence of HBsAg and anti-HBs among males (7.8% and 44.7%, respectively) than females (3.3% and 34.8%, respectively). These findings are of statistical significance ($p < 0.001$ and < 0.01). The prevalence of anti-HCV was, also, higher among males than females HCWs, but this difference is of no statistical significance ($p > 0.05$), as it is shown in Table 1.

Table 1: Sex distribution of hepatitis B markers and anti-HCV positivity among HCWs

Sex	No. tested	HBsAg positivity		Anti-HBs positivity		Anti-HCV positivity	
		No.	(%)	No.	(%)	No.	(%)
Male	752	59	(7.8)	336	(44.7)	16	(2.13)
Female	904	30	(3.3)	315	(34.8)	9	(0.99)
P value		< 0.001		< 0.01		NS	

The HBsAg carrier rate was decreasing from 7.7% in HCWs less than 25 years of age to 3.8% in those 55 years of age and more. These variations are of no statistical significance ($p > 0.05$). On the other hand a striking statistically significant ($p < 0.001$) increase in the prevalence of anti-HBs from 25.2% in HCWs less than 25 years of age to 55.3% in those 55 years of age and more was demonstrated. The prevalence of anti-HCV was, also, increasing with advancing age from 0.89% to 2.27%, but these variations are of no statistical significant ($p > 0.05$). These findings are shown in Table 2.

Table 2. Age distribution of hepatitis B markers and anti-HCV positivity among HCWs

Age group (Years)	No. tested	HBsAg positivity		Anti-HBs positivity		Anti-HCV positivity	
		No.	(%)	No.	(%)	No.	(%)
< 25	337	26	(7.7)	85	(25.2)	3	(0.89)
25 – 34	548	29	(5.3)	186	(31.9)	7	(1.27)
35 – 44	343	15	(4.4)	148	(43.1)	5	(1.45)
45 – 54	296	14	(4.7)	159	(53.7)	7	(2.36)
≥ 55	132	5	(3.8)	73	(55.3)	3	(2.27)
P value		NS		< 0.001		NS	

A higher rate of HBsAg was detected among HCWs from low socioeconomic level than those from high socioeconomic level (5.8% and 3.9%, respectively). This difference, however, is of no statistical significance ($p > 0.05$). A significantly higher ($p < 0.05$) rate of anti-HBs among HCWs from low socioeconomic level than that from high socioeconomic level (41.6% and 31.1%, respectively) was demonstrated. Anti-HCV was, also, detected in higher rate among health personnel of low socioeconomic level than those from high socioeconomic level (1.62% and 1.12%, respectively), but this difference is of no statistical significance ($p > 0.05$). These results are shown in Table 3. Table 4 shows the prevalence of hepatitis B markers and anti-HCV among HCWs in relation to risk factors of exposure. Health personnel who had a personal history of hepatitis were more like to be HBsAg positive than those without such a risk factor (OR = 2.2, 95%CI= 1.1 – 4.5). No significant difference was found for other risk factors. There was a statistically significant higher prevalence of anti-HBs among HCWs with family history of hepatitis only than those without such a risk factor (OR=1.9, 95%CI= 1.3 – 2.8). However, personal history of hepatitis although does not reach the 95%CI conventional level of significance it is very near to it (OR= 1.2, 95CI= 0.9 – 1.8). Health personnel with personal history of hepatitis (OR= 4.3, 95%CI = 1.5 – 11.8), or blood transfusion (OR= 3.8, 95%CI= 1.5 – 9.8) had a significantly higher prevalence of anti-HCV when compared with those without such risk factors. Other risk factors had no statistical significant association.

Table 3: Prevalence of HBV markers and anti-HCV according to the socioeconomic status

Socio-economic status	No. tested	HBs positivity		Anti-HBs positivity		Anti-HCV positivity	
		No.	(%)	No.	(%)	No.	(%)
High	357	14	(3.9)	111	(31.1)	4	(1.12)
Low	1299	75	(5.8)	540	(41.6)	21	(1.62)
P value		NS		< 0.05		NS	

Table 4: Prevalence of hepatitis B markers and anti-HCV among HCWs in relation to risk factors

Risk factor	No.	HBsAg		Anti-HBs		Anti-HCV	
		%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Personal history of hepatitis [1]	94	10.6	2.2 (1.1-4.5)	57.7	1.2 (0.9–1.8)	5.32	4.3 (1.5–11.8)
Family history of hepatitis	113	8	1.6 (0.8–3.2)	54.0	1.9 (1.3–2.8)	2.65	2.65 (1.9–6.4)
History of blood transfusion	130	3.8	0.6 (0.3–1.7)	43.8	1.2 (0.8–1.7)	4.62	3.8 (1.5–9.8)
History of surgical procedure	168	7.7	1.5 (0.8–2.8)	37.5	0.9 (0.7–1.3)	1.79	1.2 (0.3–4.1)
History of Frequent injections	73	2.7	0.5 (0.1–2.0)	38.4	0.9 (0.6–1.5)	2.74	1.9 (0.4–8.3)
Tattooing	82	3.7	0.6 (0.2–2.1)	30.5	0.6 (0.4–1.1)	1.22	0.7 (0.1–5.9)

1 Odds of a health care worker was being serologically positive if his risk factor is personal history of hepatitis (or family history of hepatitis …etc) versus the odds of all other risk factors combined.

Discussion:

The study shows that HBsAg is more prevalent in males than females. This observation was repeatedly reported in literature 4, 6. This difference in prevalence between sexes is probably due to a more rapid decline in HBsAg titer in females resulting in a shorter duration of the carrier state 6. Arya et al 7, however, reported no intersex variations. Anti-HBs was, also, significantly different between males and females. Several workers reported a high exposure rate to HBV infection among males than females 8, 9. This high exposure may be attributed to occupational factors, travel and social differences that are known to be more identified with male population 10. The high prevalence rate of anti-HCV among males than among females is consistent with that of other workers 11. Frider et al 12, however, detected a higher prevalence of anti-HCV among females than males. The high prevalence of HBsAg among younger age groups probably represents a recent exposure to HBV while the lower detection among older age groups may be attributed to the clearance of the antigen and subsequent development of antibodies with advancing age. However, the increased prevalence of anti-HBs and anti-HCV with advancing age may reflect a frequent exposure to minute amount of blood and other infectious materials. Several workers have, also, reported increased rates of exposure to HBV 4 and HCV 12, 13 with advancing age. The seropositivity rates of HBV and HCV infections were found to be inversely correlated with the socioeconomic level. These findings are in agreement with that of other workers 14. Others, however, did not find such correlation between the prevalence of HBV 16 and HCV 16 and the level of education. The results of this study revealed also an increasing frequency of HBV markers as function of personal and family history of hepatitis and no correlation between history of blood transfusion, surgical procedures, frequent injections or tattooing and prevalence of HBV markers. Several workers have, also, reported such a correlation with personal 15 and family 9 history of hepatitis, while Elavia et al 17 did not report such correlation. Others did not reveal any significant correlation between history of blood transfusion 15, 18, surgical procedure 17, 18 or frequent injection and tattooing 9 and increasing frequency of HBV markers. An increased risk of HCV infection was demonstrated in those having personal history of hepatitis, which is in agreement with that of other workers 19. History of blood transfusion was, also, associated with increased risk of HCV. A finding which agrees with that of Polish et al 19. This is most likely due to lack of blood screening for HCV till early nineties when this virus was found to be the aetiological agent in more than 90% of cases of post-transfusion non - A non- B hepatitis 20. There was, also, non-significant correlation between family history of hepatitis, surgical procedures, frequent injections or tattooing and increased prevalence of anti-HCV. Other workers have reported such no correlation with family history of hepatitis 19 or surgical procedures 17.The fact that no significant association of prevalence of HBV markers was demonstrated in health personnel with history of blood transfusion, surgical procedures, frequent injections or tattooing indicates that non – parentral route is the major route of transmission of HBV infection. On the other hand the finding that a significantly higher percent of health personnel had a history of blood transfusion clearly indicates that blood transfusion is the major route of transmission of HCV.

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