

Hepatitis B and C viral infection: prevalence, knowledge, attitude and practice among barbers and clients in Gharbia governorate, Egypt

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التهاب الكبد B والعدوى بفيروس C: الانتشار، والمعرفة، والتوجهات، والممارسات بين الحلاقين والزبائن في محافظة الغربية، مصر
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الخلاصة: أجريت الدراسة في مصر لتحديد انتشار التهاب الكبد B والعدوى بفيروس C بين الحلاقين (وعددهم 308)، وزبائنهم (وعددهم 308) في محافظة الغربية، وجرى تقييم للمعرفة، وللتوجهات، وللممارسات أثناء قص الشعر والحلاقة. واكتشف المستضد السطحي للفيروس الكبد HBsAg بين 4.2% من الحلاقين، و3.9% من الزبائن (في المدن أكثر من الأرياف). واكتشف الضد للفيروس C في 12.3% من الحلاقين، و12.7% من الزبائن. وكان معدل HCV-RNA هو 9.1% بين كل من الحلاقين والزبائن (وفي المدن أكثر من الأرياف). وكان لدى غالبية المشاركين معرفة ولو حظ على غالبية الحلاقين اتباع ممارسات جيدة أثناء الحلاقة وقص الشعر. ويبدو أن الحلاقين ليس لديهم تأمين من الخطر الوظيفي بالتعرض للإصابة بالتهاب الكبد.

ABSTRACT A study in Egypt determined the prevalence of hepatitis B and C virus infections among barbers ($n = 308$) and their clients ($n = 308$) in Gharbia governorate, and assessed knowledge, attitude and practices during hair-cutting and shaving. HBsAg was detected among 4.2% of barbers and 3.9% of clients (more urban than rural). Anti-HC antibodies were detected in 12.3% of barbers and 12.7% of clients. HCV-RNA prevalence was 9.1% among both barbers and clients (more rural than urban). Knowledge was high among the majority of participants and good practices during shaving and hair-cutting were observed for the majority of barbers. Barbers appeared to have no job-related risk of acquiring viral hepatitis.

Infection par les virus de l'hépatite B et de l'hépatite C : prévalence, connaissances, attitudes et pratiques chez les coiffeurs pour hommes et leurs clients dans le gouvernorat de Gharbia (Égypte)

RÉSUMÉ Une étude réalisée en Égypte a déterminé la prévalence des infections par les virus de l'hépatite B (VHB) et de l'hépatite C (VHC) chez les coiffeurs pour hommes ($n = 308$) et leurs clients ($n = 308$) dans le gouvernorat de Gharbia, et évalué les connaissances, les attitudes et les pratiques pendant la coupe de cheveux et le rasage. L'antigène de surface (Ag HBs) du VHB a été détecté chez 4,2 % des coiffeurs et 3,9 % des clients (plutôt citadins que ruraux). Des anticorps anti-HC ont été trouvés chez 12,3 % des coiffeurs et 12,7 % des clients. La prévalence de l'ARN du VHC était de 9,1 % chez les deux groupes (plutôt ruraux que citadins). Les connaissances étaient élevées chez la plupart des participants et de bonnes pratiques ont été observées lors du rasage et de la coupe des cheveux chez la plupart des coiffeurs. Ceux-ci ne semblaient pas courir de risque de contracter une hépatite virale dans le cadre de leur travail.

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Received: 14/02/08; accepted: 09/04/08

Introduction

Bloodborne diseases impose heavy burdens on national economies and individual families due to costs arising from acute and chronic morbidity and mortality. Globally, 2 billion people are infected with hepatitis B virus (HBV). An estimated 170 million persons are chronically infected with hepatitis C virus (HCV) and 3–4 million persons are newly infected each year [1,2].

The highest HCV prevalence in the world is in Egypt, where the prevalence of infection increases steadily with age. High rates of infection are observed among all age groups although there are regional differences in the average overall prevalence [3–5]. The prevalence ranges from 10% to 20% of the general population, and rural populations show a higher prevalence than urban ones. This difference has been attributed to past infection and treatment of schistosomiasis [6–8].

The barber shop is a place where hair-cutting, shaving and hair reforming for men are practised. Negligence during the use of sharp instruments may be a risk factor for bloodborne infections, causing serious health problems for both the barber and the clients [9]. Razor sharing and shaving in barber shops has been identified as a key risk factor for HBV infection in Italy [10]. It has also been identified as a risk factor for HCV among institutionalized patients [11].

The objectives of this study were to determine the prevalence of both HBV and HCV infections among barbers and a sample of their clients in Gharbia governorate, Egypt, and to assess the knowledge and attitude of the study population regarding viral hepatitis and their practices during hair cutting and shaving.

Methods

Study setting

This study was carried out during the year 2007 in Gharbia governorate, one of the governorates of the Nile Delta

area. Two out of 8 administrative areas of the governorate were randomly chosen as the study location (Tanta and Mahalla El-Koubra). The 2 cities (Tanta and Mahalla El-Koubra) were included to represent urban localities, while 3 villages (from 42 villages related to Tanta and 55 villages related to Mahalla) were selected randomly from the list of total villages to represent rural localities. Gharbia governorate has a population of nearly 3 million, with an urban to rural ratio of residents of 1:2.

Sample

The target population of the study was people working in barber shops and practising hair-cutting and shaving and 1 regular client from each shop who had attended for at least 1 year.

Based on the lowest reported prevalence of 3% for hepatitis B surface antigen (HBsAg), the sample size that could detect a prevalence ranging from 1%–5%, at a 95% confidence level, was estimated as 280 in each group (barbers and clients). In fact 616 subjects (308 barbers and 308 clients) were enrolled as follows. All barbers in the chosen 6 villages who agreed to participate in the study were included (a total of 147 barbers out of 159 barbers) and the same number of clients, plus a total of 161 barbers from urban areas in both Tanta and Mahalla cities and the same number of clients. The proportion of individuals who refused to participate ranged from 4% to 8% at different localities of the study. Efforts were made to explain the objectives of the study and its benefits to the participating person and the whole community in order to minimize refusals, which were mainly due to fears about discovering their serostatus or giving a blood sample.

A block sampling technique with a map was used. Regarding the urban areas, a multistage random sample was used. Both Tanta and Mahalla El-Koubra cities were classified into 2 large strata, based on the socioeconomic

standard of the dwellings (high and medium-low). Each stratum was further divided into clusters and 5 clusters were chosen randomly from each stratum. A list of barber shops in the study areas was prepared with the help of senior barbers living in the study area. Direct personal communication with barbers in their working shop was made to get their consent and cooperation before being enrolled in the study. While collecting data from the barber, one of the attending clients at that time was approached and invited to participate in the study after the purpose of the study was explained. In case of refusal by the client another person was chosen in the same setting.

Data collection

A pre-designed, structured questionnaire sheet was filled inside the barber shop through direct personal interview with both the barber and the client. Direct observation of the place and the practice of the barber during his work were also carried out. The questionnaire sheet included the following data: sociodemographic data; knowledge, awareness and beliefs related to HBV and HCV infection; attitude to HBV and HCV; risky behaviours that might contribute to infection with both types of hepatitis; and an observational checklist for barbers' practice during hair-cutting/shaving. The cut-off for a high level knowledge was defined as > 50% of questions correct.

Before starting data collection the research team reviewed thoroughly the questionnaire and received an orientation training on communication skills and were trained on the methods of data collection. The validity of the questionnaire was tested by expert and peer review and the reliability was tested by the test–retest method in a pilot study including 30 barbers and 30 clients not included in the study sample.

A blood sample (5 mL) was taken from each study subject through

venepuncture using a vacutainer device. The sample was allowed to clot naturally to separate the serum for analysis and was stored upright in an ice box/refrigerator at a temperature of 2–8 °C (for up to 3 days) until it was sent to the laboratory for analysis.

For diagnosis of HBV infection, an *in vitro* diagnostic kit for the detection of HBsAg in human serum was used (Biorex Diagnostics, UK). This test is an enzyme-immunoassay based on a “sandwich” principle.

For diagnosis of HCV, a 3rd-generation enzyme-linked immunosorbent assay (ELISA) kit for qualitative detection of antibodies to HCV in human serum or plasma was used (Biorex Diagnostics, UK). Samples found to be negative on the preliminary screening were considered HCV-seronegative. Initially positive and borderline samples were confirmed by qualitative HCV-RNA detection assays using classic polymerase chain reaction using a commercial kit (HEPA-Check-C, Nuclear Laser Medicine, Italy).

Standard techniques were applied according to the manufacturer’s guidelines. Laboratory investigations were carried out in a specialized private laboratory (Al-Ahram Laboratory, Tanta).

Ethical considerations

The people recruited to the study were informed about the objectives of the study and that they were free to refuse participation. A verbal witnessed consent was obtained from each study participant. Clients or barbers < 18 years old were not included in the study as they were unable to give legal consent. The confidentiality of collected data and for the results of investigations was assured. Only the principal investigator held the results of blood samples tested. The participants were informed about their HBV/HCV test results if they expressed a desire to be informed. These results were delivered in person in a sealed envelope.

Statistical analysis

The collected data were organized, tabulated and statistically analysed using SPSS, version 12. The chi-squared test was used for testing the significance of differences between the study groups. When the chi-squared test was not appropriate, Fisher exact test was used. The level of significance was 5%.

Results

A total of 616 subjects (308 pairs of barbers and clients) were included: 322 from urban areas (161 pairs) and 294 from rural settings (147 pairs).

The majority of the study subjects (64.3% of barbers and 59.4% of clients) were aged 20–40 years. Nearly one-half of barbers (49.7%) and 41.2% of clients had intermediate education. About one-third of clients (36.7%) were highly educated compared with only 7.8% of barbers.

HBsAg was detected in 25 individuals (13 barbers and 12 clients), an overall prevalence of 4.1%. The rate was similar among barbers and clients (4.2% versus 3.9%) (Table 1). The prevalence of HBsAg among urban barbers and clients was higher than that among rural ones (6.2% versus 2.0%), although not significantly so. Anti-HCV antibodies were detected in 77 individuals with an overall prevalence of 12.5%. Again, the rate was almost the same among barbers and their clients (12.3% versus 12.7%). The infection rate was highest among rural clients (13.6%) followed by rural barbers (12.3%). The prevalence of anti-HCV was equal among urban barbers and their clients (11.8%). Detection of HCV-RNA revealed similar figures among both barbers and clients (9.1%). The prevalence in rural subjects was higher than that of urban subjects (10.2% and 8.1% respectively). Double infection was detected in 3 subjects (1 barber and 2 clients). There was no statistically significant difference between

barbers and clients in the rate of HBV or HCV infection (Table 1).

The level of knowledge about modes of transmission was high among the majority of the study participants (over 80% for most questions). Knowledge about the existence of protective drugs and vaccines was too low; about 40% knew about the presence of an HBV vaccine and around one-quarter claimed to know about a protective vaccine for HCV. Friends and relatives were the main source of information for both barbers (46.1%) and clients (49.7%), followed by television, newspapers and doctors (Table 2).

About two-thirds of the barbers (67.9%) and more than half of the clients (55.5%) were concerned about the status of shaving blades used ($P = 0.002$) (Table 3). Positive attitudes towards antiseptic use after shaving and safe injections was found among 55.8% and 49.0% of barbers compared with 70.5% and 66.9% of clients respectively ($P < 0.001$). It was also found that 217 (70.5%) of the barbers would not mind being tested for viral hepatitis and 145 (47.1%) would be willing to have periodic screening for viral hepatitis and other bloodborne diseases.

The practice of barbers during shaving showed that changing the blade for each client was the practice of 291 barbers (94.5%); 93.2% of urban and 95.9% of rural ones. Disinfection of used instruments was practised by 76.9% and washing hands by 63.0% of them. Wearing protective clothes, especially gloves, was practised by 52.8% of urban barbers and only 9.6% of rural ones. The difference between rural and urban barbers regarding these practices was not statistically significant, except for wearing protective clothes/gloves and washing used instruments ($P < 0.001$) (Table 4).

The shaving practices of the clients revealed that the practice of urban clients was better than that of rural ones regarding verification of the status of

Table 1 Prevalence of hepatitis B (HBV) and C virus (HCV) infection among barbers and their clients

Hepatitis infection	Barbers						Clients						Total (n = 616)		Statistics
	Urban (n = 161)		Rural (n = 147)		Total (n = 308)		Urban (n = 161)		Rural (n = 147)		Total (n = 308)		No.	%	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Uninfected	133	82.6	125	85.0	258	83.8	133	82.6	126	85.7	259	84.1	517	83.9	$\chi^2 = 0.000$
Infected	28	17.4	22	15.0	50	16.2	28	17.4	21	14.3	49	15.9	99	16.1	$\chi^2 = 1.000$
HBV +ve (HBsAg)	10	6.2	3	2.0	13	4.2	9	5.6	3	2.0	12	3.9	25	4.1	$\chi^2 = 0.04; P = 0.838$
HCV +ve (anti-HCV)	19	11.8	19	12.9	38	12.3	19	11.8	20	13.6	39	12.7	77	12.5	$\chi^2 = 0.01; P = 0.903$
HCV +ve (HCV-RNA)	13	8.1	15	10.2	28	9.1	13	8.1	15	10.2	28	9.1	56	9.1	$\chi^2 = 0.04; P = 0.839$

1 barber and 2 clients were infected with both types of hepatitis.
HBsAg = hepatitis B surface antigen.

used instruments before shaving ($P < 0.001$), bringing their own instruments ($P = 0.019$) and asking the barber to wash his hands before shaving ($P = 0.012$). The practice of rural clients was better regarding refusing shaving with used instruments ($P < 0.001$) and asking the barber to disinfect used instruments (but not statistically significant) (Table 5).

On observing barber's shops and their practice during shaving it was found that, in general, the majority of shops were well-equipped, clean and neat. Rural shops were significantly better than urban shops regarding the electric supply and ventilation while urban shops were better regarding the presence of washing facilities and good decoration. Observations during shaving revealed that using a razor machine, throwing used blades in the waste bin and disinfection of skin cuts were practised by more than three-quarters of barbers with a significantly higher rate of use of a razor machine among urban compared with rural barbers ($P < 0.001$). Using alum as antiseptic for skin cuts was practised by a higher percentage of urban than rural barbers, while rural clients were more likely to change the blade for each client ($P < 0.001$) (Table 6).

Discussion

The prevalence of HBV and HCV infection has been widely investigated in many occupational groups, but few data are available on the prevalence in barber shops. Therefore, this study may fill a gap.

The prevalence of HBsAg has been reported to range from 3% to 11% in Egypt [12]. In the present study, the total prevalence of HBsAg detected was 4.1%, which is near the lower limit of the recorded national range. This rate is lower than that reported among barbers in Turkey (8.5%) [13], but higher than among barbers in Morocco where HBV was found in only 2% of 150 barbers [14].

Qirbi et al. stated that HBV is generally associated with poor socioeconomic conditions [15]. However, the present study revealed that HBsAg was more prevalent among urban barbers and clients, who may be assumed to be of higher social class, than rural subjects. In contrast, our study revealed a higher prevalence of HCV infection among barbers and clients of rural areas than urban ones. These results are similar to the findings of previous studies among the general population that attribute the higher figures in rural areas to the endemicity of schistosomiasis and the use of glass syringes for parenteral treatment in the past decades. In addition, these studies observed that the seroprevalence rates of HCV were much higher in villages in the Nile Delta region compared with Upper Egypt and this was correlated with the difference in schistosomiasis infection rates in both regions [16,17]. Other workers assume that schistosomiasis-induced immune

Table 2 Knowledge of barbers and clients about hepatitis B (HBV) and C virus (HCV) infection

Knowledge item	Barbers (n = 308)		Clients (n = 308)		Total (n = 616)		χ^2 -value	P-value
	No.	%	No.	%	No.	%		
General awareness								
Ever heard about liver diseases	268	87.0	284	92.2	552	89.6	3.92	0.048*
Ever heard about viral hepatitis B & C	265	86.0	250	81.2	515	83.6	2.32	0.128
Knew modes of transmission								
Blood transfusion	285	92.5	290	94.2	575	93.3	0.42	0.518
Reusing needles	279	90.6	289	93.8	568	92.2	1.83	1.176
Dental procedures	261	84.7	275	89.3	536	87.0	2.43	0.119
IV drug use	271	88.0	262	85.1	533	86.5	0.89	0.345
Scissors/surgical instruments	256	83.1	271	88.0	527	85.5	2.57	0.109
Barbers shaving instruments	239	77.6	254	82.5	493	80.0	1.99	0.158
Ear/body piercing	205	66.6	230	74.7	435	70.6	4.51	0.034*
Sexual contact	203	65.9	217	70.5	420	68.2	1.26	0.261
Tattooing	196	63.6	223	72.4	419	68.0	5.04	0.025*
Sharing utensils	150	48.7	167	54.4	317	51.5	1.66	0.197
Food	114	37.0	126	40.9	240	39.0	0.83	0.363
Water	78	25.3	104	33.8	182	29.5	4.87	0.027*
Others	103	33.4	56	18.2	159	25.8	17.94	0.001*
Complications/treatment of viral hepatitis								
On liver	43	14.0	64	20.8	107	17.4	4.52	0.033*
On general health	32	10.4	33	10.7	65	10.6	0.02	0.895
Presence of HBV treatment	55	17.9	57	18.5	112	18.2	0.01	0.917
Presence of vaccine for HBV	125	40.6	138	44.8	263	42.7	0.96	0.328
Presence of HCV treatment	111	36.0	89	28.9	200	32.5	3.27	0.071
Presence of vaccine for HCV	81	26.3	73	23.7	154	25.0	0.42	0.515
Source of information								
Friends & relatives	142	46.1	153	49.7	295	47.9	0.650	0.420
Television	148	40.1	117	38.0	265	43.0	5.960	0.014*
Newspapers	99	32.1	127	41.2	226	36.7	5.090	0.024*
Doctors	76	24.7	109	35.4	185	30.0	7.910	0.005*
Radio	61	19.8	74	24.0	135	21.9	1.370	0.245
Health care workers	16	5.2	44	14.3	60	9.7	13.46	0.001*
Others	47	15.2	15	4.9	62	10.1	17.12	0.001*

*P < 0.05.

More than 1 answer was reported.

IV = intravenous.

Table 3 Attitude of barbers and clients towards risk factors for hepatitis

Attitude item	Barbers (n = 308)		Clients (n = 308)		Total (n = 616)		χ^2 -value	P-value
	No.	%	No.	%	No.	%		
Concerned about status of used blades	209	67.9	171	55.5	380	61.7	9.40	0.002*
Concerned about using antiseptics	172	55.8	217	70.5	389	63.1	13.51	0.001*
Concerned about using disposable syringes	151	49.0	206	66.9	357	58.0	19.43	0.001*

*P < 0.05.

Table 4 Shaving practices of barbers in their shops by residence

Practice item	Barbers' residence				Total (n = 308)		χ^2 -value	P-value
	Urban (n = 161)		Rural (n = 147)		No.	%		
	No.	%	No.	%				
Changes the blade for each client	150	93.2	141	95.9	291	94.5	0.650	0.420
Disinfects the instruments	117	72.7	120	81.6	237	76.9	2.990	0.084
Only washes the used instruments	103	64.0	69	46.9	172	55.8	8.370	0.004*
Washes hands	104	64.6	90	61.2	194	63.0	0.240	0.621
Wears protective clothes/or gloves	85	52.8	14	9.6	99	32.1	64.00	0.001*
Disinfectant used								
Perfume	82	50.9	46	31.3	128	41.6	11.41	0.001*
Savlon®	79	49.1	47	32.0	126	40.9	8.60	0.003*
Alcohol	61	37.9	50	34.0	111	36.0	0.35	0.556
Talcum powder	34	21.1	7	4.8	41	13.3	16.42	0.001*
Povidone/iodine	14	8.7	15	10.2	29	9.4	0.07	0.797
Hydrogen peroxide	17	10.6	2	1.4	19	6.2	9.70	0.002*
Dettol®	8	5.0	9	6.1	17	5.5	0.04	0.847
Water	4	2.5	5	3.4	9	2.9	FE	0.741
Alum crystals (shaba)	1	0.6	4	2.7	5	1.6	FE	0.196
None	3	1.9	3	2.0	6	1.9	FE	1.000
Changes disinfectant frequently	91	56.5	89	60.5	180	58.4	0.36	0.549

*P < 0.05.

More than 1 answer was reported.

FE = Fisher exact test.

suppression could increase the persistence of viraemia following acute infection with both HBV and HCV and this could partly explain the high prevalence of HCV infection in Egypt [18,19]. However, no association was observed between HCV and *Schistosoma mansoni* infection in endemic areas in either Egypt or Brazil [20,21].

Many workers consider infection with HBV and HCV to be an

occupational hazard for barbers [10,22]. Other researchers consider barbers a source of infection to their clients, especially when there is reuse of razor blades that may transmit infection through micro-trauma [23,24]. However, others found no relation between shaving by community barbers and infection with viral hepatitis [5]. Özdemir et al. concluded that HBV and HCV infections are not occupational risks

for barbers and hairdressers [24]. The same can be concluded from the results of the present study, as the rate of viral hepatitis infection among barbers was the same as that among their regular clients and was similar to the prevalence in the general population in Egypt [4,5,16]. This is consistent with our finding that barbers and their clients were not generally being exposed to risk factors for HBV and HCV infection

Table 5 Shaving practices of clients at barber shops by residence

Practice item	Clients' residence				Total (n = 308)		χ^2 -value	P-value
	Urban (n = 161)		Rural (n = 147)		No.	%		
	No.	%	No.	%				
Verifies the status of instruments	130	80.7	89	60.5	219	71.1	14.29	0.001*
Asks if the instruments has been disinfected	58	36.0	65	44.2	123	39.9	1.82	0.177
Asks barber to disinfect the instruments	72	44.7	74	50.3	146	47.4	0.76	0.383
Refuses shaving with used instruments	53	32.9	106	72.1	159	51.6	45.70	0.001*
Brings his own instruments	44	27.3	23	15.6	67	21.8	5.49	0.019*
Asks barber to wash his hands before shaving	30	18.6	12	8.2	42	13.6	6.29	0.012*

*P < 0.05.

Table 6 Observations of conditions in barber shops and barbers' shaving practices

Observation items	Urban (n = 161)		Rural (n = 147)		Total (n = 308)		χ^2 -value	P-value
	No.	%	No.	%	No.	%		
Barber shop								
Has adequate electric supply	116	72.0	127	86.4	243	78.9	8.65	0.003*
Has adequate ventilation	112	69.6	130	88.4	242	78.6	15.15	0.001*
Has ceiling fans/airconditioning	112	69.6	123	83.7	235	76.3	7.70	0.005*
Is clean and neat	110	68.3	110	74.8	220	71.4	1.29	0.256
Has adequate sinks for washing hands and face	109	67.7	110	74.8	219	71.1	1.57	0.210
Has good washing facilities	89	55.3	65	44.2	154	50.0	3.33	0.068
Is decorative/attractive	97	60.2	56	38.1	153	49.7	14.21	0.001*
Situated on main road	67	41.6	61	41.5	128	41.6	0.01	0.924
Situated in internal market area	44	27.3	31	21.1	75	24.4	1.30	0.253
Barber's practices during shaving								
Uses razor machine	154	95.7	119	81.0	273	88.6	15.06	0.001*
Throws used blades in waste bin	137	85.1	126	85.7	263	85.4	0.02	0.877
Properly disinfects skin cuts	123	76.4	119	81.0	242	78.6	0.70	0.404
Washes razor with antiseptic	122	75.8	95	64.6	204	66.2	4.07	0.044*
Sterilizes the razor before use for each client	85	52.8	89	60.5	174	56.5	1.58	0.209
Causes cuts from razor machine	118	73.3	56	38.1	174	56.5	37.31	0.001*
Uses alum as antiseptic for skin cuts	99	61.5	61	41.5	160	51.9	11.52	0.001*
Uses new razor for each client	86	53.4	118	80.3	135	43.8	23.59	0.001*
Puts used blades in the box	62	38.5	33	22.4	95	30.8	8.55	0.003*
Washes razor with tapwater only	23	14.3	16	10.9	39	12.7	0.53	0.468

*P < 0.05.

and that knowledge and practices were good among a considerable percentage of barbers.

In our study, the level of knowledge among barbers and their clients was relatively high, especially regarding modes of transmission. But there were information deficits about the complications and treatment of hepatitis, perhaps because friends and relatives were an important source of information. Studies carried out in Morocco, Ethiopia and Pakistan showed that the level of knowledge and awareness of barbers about the concept of infectious risk associated with blood was generally very low, especially for HBV and HCV [14,25,26]. Poor knowledge and lack of awareness of the general public about HBV and HCV is the main cause of the rapid spread of these infections in

developing countries compared with developed ones [26,27].

In previous studies, it was found that the proportion of barbers with a positive attitude to the risk of virus transmission was greater than the proportion of those with good knowledge and good practice [22,25]. The present study showed that there were positive attitudes towards safe injections and use of antiseptics, especially among clients. The practices of barbers were also generally sound, as similarly documented in Pakistan [27]. However, the practice of throwing used blades in the waste bin poses a major risk to garbage handlers and waste scavengers, who in Egypt and other developing countries commonly search the waste dumps for valuable items and metals and are also likely to be children.

The majority of barber shops in Gharbia governorate had good hygiene conditions, whereas Zahraoui-Mehadj et al. reported that hygienic conditions were deficient among barbers in Morocco [15].

There were some limitations to the study. The sample size of barbers was chosen to be representative of all barbers in the studied areas. However, the sample size of clients was small and not fully representative of all clients. Thus the study gives only a general picture of the situation among clients.

Conclusions

This study revealed a very similar infection rate of HBV and HCV among barbers and their clients to that reported nationally. The prevalence of HBV and

HCV among barbers was similar to that among clients. Barbers appeared to have no job-related risk of acquiring viral hepatitis. This may be due to the relatively good knowledge among barbers about modes of transmission and positive attitude towards protecting themselves and their clients and also due to good practices by the majority of

the studied barbers and good hygiene conditions in barber shops.

Acknowledgements

This study received technical and financial support from the joint WHO Eastern Mediterranean Regional Office

(EMRO), Division of Communicable diseases (DCD) and the WHO Special Programme for Research and Training in Tropical Diseases (TDR): the EMRO/TDR Small Grants Scheme for Operational Research in Tropical Medicine and other Communicable Diseases.

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