Seroprevalence, Knowledge, Attitude and Practices among Barbers and Their Customers Regarding HCV and HBV in Assiut District, Egypt

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Abstract: *Hepatitis C virus (HCV) is an emerging global epidemic disease. Egypt reports the highest incidence in the world.*
Aim of the study*: To estimate seroprevalence and to assess knowledge, attitude and practices regarding HCV and HBV among barbers and their customers in Assiut District, Egypt.*
Methods*: Quesi-experimental research design carried out in Assiut District and City. Included 350 participants (175 barbers and 175 customers). Data collected by using three tools; tool (1): interview form consisted of four parts; first part included demographic data. The second part included assessment of medical and surgical history of barbers and customers. The third part included assessment of knowledge regarding the HCV&HBV. Fourth part: Included serological blood tests to detect infection with HCV and HBV. Tool (2): Included Likert attitude scale. Tool (3): Observational checklist to assess practices of barbers and customers.*
Results: *Majority of barbers and their customers (88.6% and 80.6% respectively) had poor knowledge regarding HCV and HBV. Over all prevalence of HBV and/or HCV among the participated sample was (8.6%).*
Conclusion: *The majority of the seropositive barbers had a history of exposure to blood during their barbing practice. As well as, (16.7%) of the seropositive customers had conducted a surgical operation. Recommendations: Importance of periodic screening tests for HCV and HBV among high-risk populations such as barbers.*
Keywords: *HCV&HBV, Barbers, Knowledge, Practices.*

I. Introduction

Hepatitis is an inflammation of the liver, most commonly caused by a viral infection. There are five main hepatitis viruses, referred to as types A, B, C, D and E. **(World Health Organization (WHO), 2012)**. Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are the main causes of severe liver disease as Hepato Cellular Carcinoma (HCC). WHO estimated that over 2 billion people have been infected with HBV and 170 million HCV infected patients world-wide. HBV is 50 to 100 times more infectious than Human Immunodeficiency Virus (HIV) **(Jokhio et al, 2007, WHO, 2010 and Averhoff, 2012)**.

Recent studies carried out in Egypt showed that the prevalence rates of HBV have been decreased **(Ismail et al, 2009 and Hwang and Cheung, 2011)**. The prevalence of HCV antibodies (anti- HCV) is reported to be higher in Egypt than in any other country, where the prevalence of infection increases steadily with age. This difference has been attributed to past infection and treatment of schistosomiasis **(Medhat et al, 2002 and Shalaby et al, 2007)**. The main sources of HCV and HBV transmission are the non-implementation of international standards regarding blood transfusion, reuse of needles for injections, low socioeconomic status, low public health awareness…etc. In Egypt a study on HCV seroprevalence has shown that shaving at community barbers was a characteristic exposure for the viral transmission **(Amodio et al, 2009 and Waheed et al, 2010)**.

There is strong evidence that razors, barber's scissors, nail files and body piercing instruments are risk factors for transmission of HCV and HBV. Barbers are a significant proportion of population who may expose to HBV and/or HCV and become chronically infected. These infected people may not be aware of their HBV and/or HCV status and they are not clinically ill but they act as a source of infection to others **(Jokhio et al, 2007, Wazir et al, 2008 and Amodio et al, 2009)**.

Nurses and other primary health care professionals play an important role in providing pre-and post-test discussion as part of diagnostic testing for HCV and HBV. Nurses specializing in liver conditions can impact public health through innovative educational programs. Provision of thorough test discussion in a primary health care setting utilizes a valuable educational opportunity to help minimize HCV and HBV transmission in the community **(Poll, 2009 and Zucker, 2009)**.

Significance of the study

Egypt has the largest HCV prevalence in the world with (14.7%) of the population being antibody positive for HCV. HBV is 50 to 100 times more infectious than HIV. Barbers and their customers as risk group for acquiring HCV and HBV, should be provided with high awareness about HCV and HBV to avoid the risk of infectious agents transmission by reusing of razors and scissors on multiple clients (**Jokhio et al, 2007, WHO, 2010 ᵇ, and Mohamoud et al, 2012**). HCV and HBV transmission through sharing of non-sterile sharp instruments such as those used for barbering have always been given less attention in the campaign against the spread of HCV and HBV (**Eassa et al, 2007**).

Aim of the study:

To estimate the seroprevalence and to assess knowledge, attitude and practices regarding HCV/HBV among barbers and their customers in Assiut District.

Subjects and Methods
Study design:

Quesi-experimental research design was used to assess knowledge, attitude and practices regarding viral hepatitis among barbers and their customers.

Study setting

The current study carried out at Assiut Distract and City: **Assiut Distract:** It is composing from 7 rural local units (which include 25 villages); total coverage for all these villages were carried out due to small number of barbers' shops and to represent the rural localities in the current study. **Assiut City**: Data collected according to administrative classification into (East and West sector) to represent the urban localities in the current study. Randomly selected barbers' shops were done to represent the different socioeconomic standards.

♦ **Sample characteristics**

The target populations recruited were people working in barbers' shops and practicing hair-cutting and shaving at a rotating daily open shops and one attending customer from each shop.

♦ **Sample selection technique**

Sample size calculated by using EPI/Info 2000, version (3.3), with power 80% and CI 95%; on the lowest prevalence of the disease (10%). The sample size that could detect the prevalence rate of the disease using was estimated to be 280 persons. To avoid drop out and refusal; sample size was increased to be 350 subjects (175 barbers and 175 customers).

Tools of the study: **Three tools were used in data collection:-**

An interview form based on questionnaire was supplied by the World Health Organization Eastern Mediterranean Regional Office (EMRO). It was designed and tested for a multi-country project on hepatitis in Egypt, Pakistan and Morocco as part of the special program for research and training in tropical diseases (**Shalaby et al, 2007 and Makheja et al, 2010**); this form composed from three tools: - **First tool**: Included four parts:-

Part (1): Demographic characteristics of the participated barbers and their customers:

It included demographic characteristics such as: Name, educational level...etc. More over, there were (4 questions) were asked for barbers only such as: Years of experience in barbing, working in another job rather than barbing…etc.

Part (2): Previous risky behaviors of the participated barbers and their customers:

This part used to assess the previous risky behaviors of the participated barbers and their customers such as: Visiting dentist, having tattoo …..etc.

Part (3): Knowledge of barbers and their customers about HCV and HBV:

This part used to assess knowledge of the studied sample regarding HCV/HBV. Total score of knowledge were (40). Using score system for knowledge, a correct response was scored (1) grade and zero for the incorrect (poor= score <50%, satisfactory= score 50-70% and good= score > 70%) (**Al-Thaqafy et al, 2009**).

Part (4): Included serological blood tests to detect infection with HCV and HBV.

- **Second tool (Likert scale)**: Assessment of barbers and their customers' attitudes three points Likert scale: agree, uncertain and disagree. These were scored (2, 1 and 0) respectively. The scoring was reversed for negative statements. A total score was calculated by summing up and converted into a percent score. Attitude was considered positive if the score was > 70% and negative attitude if the score < 70 %.

Validity of Likert scale items:

This scale was reviewed by (7 experts), from medical and nursing staff in Assiut University to assess and evaluate the scale items to secure the validity of this tool. Modifications were done according to the directions of the experts committee.

- **Third tool**: It included an observational checklist, used to record the observed practices of barbers and their customers to assess their risky behaviors during shaving and hair-cutting practice.

Study phases:
I- Administrative phase

An official letters of approval was obtained from the Dean of the Faculty of Nursing, Assiut University was sent to Assiut Governor for permission to carry out the study in the selected areas.

II- Pilot study:

Pilot study was carried out before starting the data collection phase on 10 persons (5 barbers and 5 customers. The aim of this phase was to test the clarity of the tools and to estimate the required time to fill the interview form.

III- Ethical considerations

The study approved by Faculty of Nursing, Assiut University ethical review committee. The people were recruited to the study informed about the objectives of the study and that they are free to refuse participation. A verbal witnessed consent obtained from the participants. The confidentiality of the collected data was assured.

IV- Data collection phase:

- **Field work**

The data were collected for around ten months from (9/5/2012 to 27/2/2013). Before visiting the barbers' shops in the selected settings, there were a preparation phases for the visit were arranged with a community leader (well-known persons in every village) and one of the inhabitants in Assiut City. The average length of each interview was (30-40) minutes. Every week about (15-20) sheets were finished. Data were collected (three days/ week).

II.   Results
Table (1): Demographic characteristics of barbers and their customers in Assiut District, 2012/2013

| Demographic characteristics	Barbers (n= 175)		Customers (n= 175)	
	No.	%	No.	%
Age (years):				
< 25 years	42	24.0	34	19.4
25 - < 30 years	58	33.1	47	26.8
30 - < 35 years	22	12.6	29	16.6
35 - < 40 years	18	10.3	22	12.6
≥ 40 years	35	20.0	43	24.6
Mean ± SD (Range)	31.72 ± 11.20 (17 – 65)		32.57 ± 9.47 (17 – 60)	
Educational level:				
Illiterate	50	28.6	25	14.3
Primary	11	6.3	12	6.9
Preparatory	14	8.0	10	5.7
Secondary	94	53.7	102	58.3
University	6	3.4	26	14.8
Marital status:				
Single	69	39.4	61	34.9
Married	106	60.6	114	65.1
Residence:				
Rural	58	33.1	61	34.9
Urban	117	66.9	114	65.1
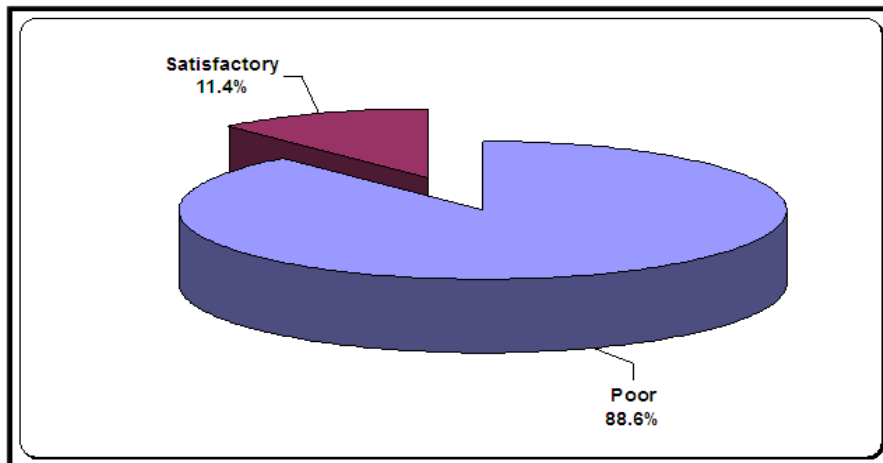
Fig (1): Total score of knowledge for barbers regarding HCV and HBV in Assiut District, 2012/2013
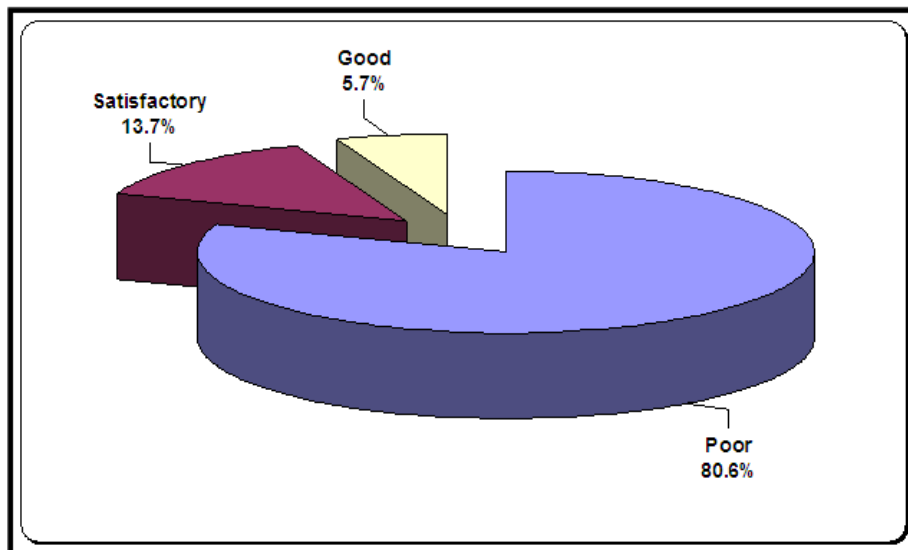
Fig (2): Total score of knowledge for customers regarding HCV and HBV in Assiut District, 2012/2013
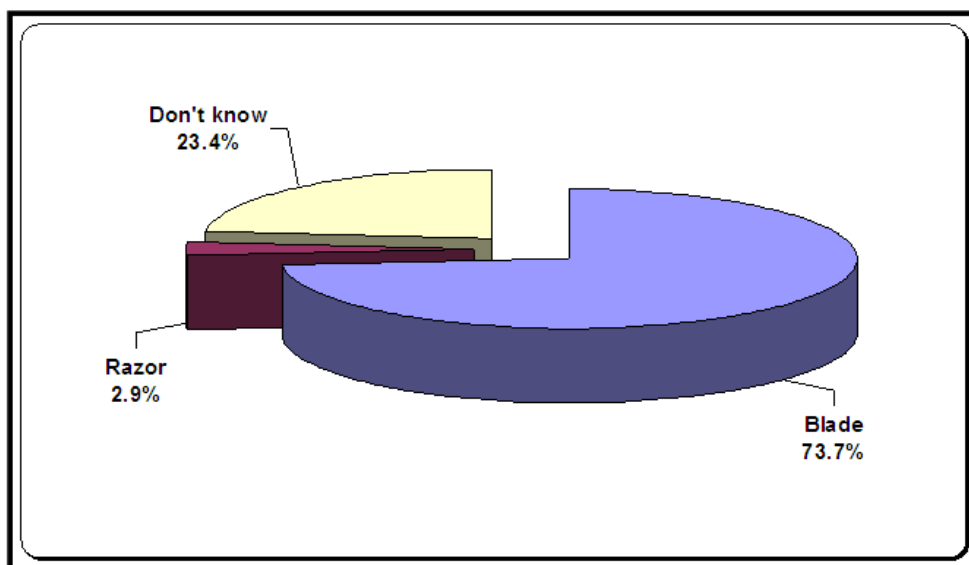
Fig (3): Knowledge of barbers about the shaving tools that may transmit HCV and HBV in Assiut District, 2012/2013
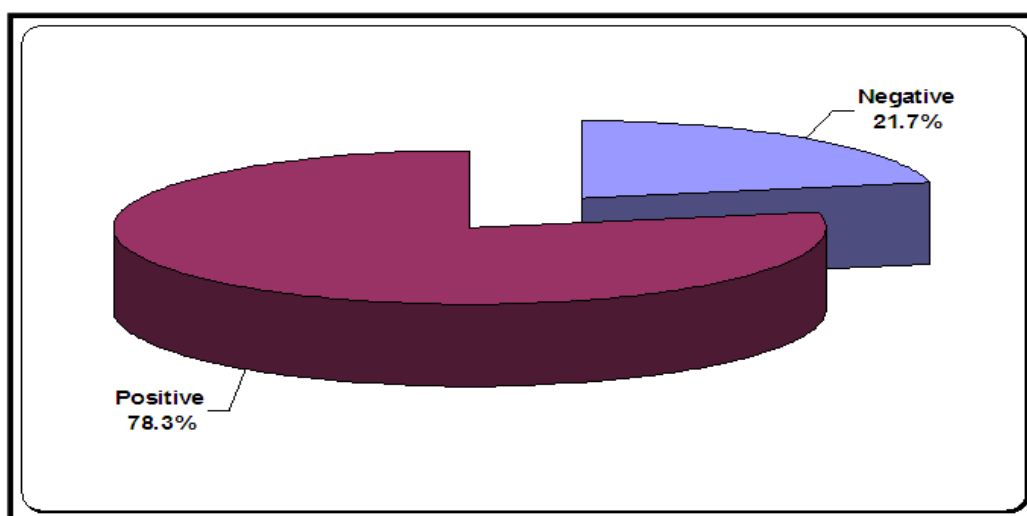
Fig (4): Attitudes of barbers regarding HCV and HBV in Assiut District, 2012/2013
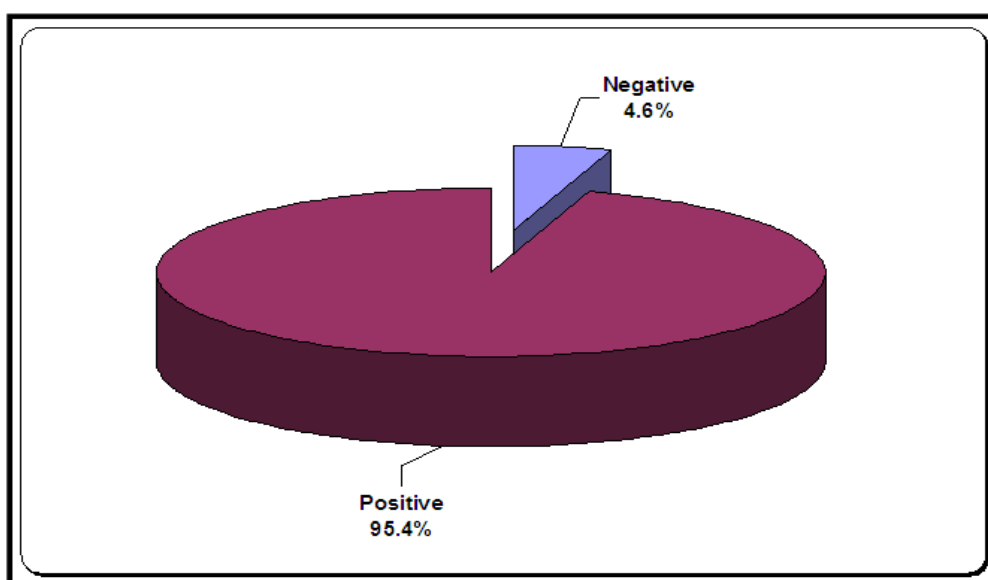

Fig (5): Attitudes of customers regarding HCV and HBV in Assiut District, 2012/2013

Table (2): Observed risky practices of barbers during shaving by residence in Assiut District, 2012/2013

Items	Rural (n= 58)		Urban (n= 117)		P-value
	No.	%	No.	%	
Washes hands between each customer	2	3.4	0	0.0	0.206
Changes the towels between each customer	1	1.7	8	6.8	0.281
Presence of plastic gloves and use it for every customer	1	1.7	0	0.0	0.719
Uses the electric shaver	56	96.5	115	98.3	0.851
Uses a new razor for each client	56	96.5	114	97.4	0.741
Sets a new apron for each customer	1	1.7	0	0.0	0.719
Uses a new blade on each new customer	1	1.7	10	8.5	0.156
Using of potash aluminum (Shaba)	1	1.7	0	0.0	0.719
Gets rid of razors in the waste products basket	5	8.6	35	29.9	0.002*
Changing of the disinfectant liquid frequently	1	1.7	3	2.6	0.726
Sweeps the shop floor after every customer	5	8.6	25	21.4	0.035*
Using Dettol as anti septic solution	5	8.6	9	7.7	0.831
Using Alcohol as anti septic solution	28	48.3	85	72.6	0.002*
Using Colonia as anti septic solution	25	43.1	23	19.7	0.001*

[#] No. (no = 4) [*]There was a significant difference Chi square test significant at $P < 0.05$

Table (3): Shaving practices of customers in Assiut District, 2012/2013

Variables	No. (n= 175)	%
Shaving at only one barber's shop	153	87.4
From how long		
< 5 years	49	32.0
5 - < 10 years	34	22.2
10 - < 15 years	36	23.5
≥ 15 years	34	22.2
Times of shaving/ month		
One	29	16.6
Two	51	29.1
Three	28	16.0
Four	64	36.6
Five	3	1.7
Can shave at home	76	43.4
Owning shaving equipments at home	76	43.4
Sharing personal equipments with family members at home	24	31.6
Asking barber to wish his hands before shaving	7	4.0
Verifying the sterilization of shaving equipments	9	5.1
Bringing their own equipments	3	1.7

Table (4): Risk factors for acquiring HCV and HBV among barbers and their customers in Assiut District, 2012/2013

Risk factors	Barbers (n=175)				P-value	Customers (n= 175)				P-value
	Rural (n= 58)		Urban (n= 117)			Rural (n= 61)		Urban (n= 114)		
	No.	%	No.	%		No.	%	No.	%	
Goza (shesha) smoking in group										
Yes	20	34.5	37	31.6	0.704	20	32.8	20	17.5	0.022*
No	38	65.5	80	68.4		41	67.2	94	82.5	
Having tattoo in the body										
Yes	0	0	1	0.8	1.000	0	0	0	0	-
No	58	100.0	116	99.2		61	100.0	114	100.0	
Visiting a dentist										
Yes	6	10.3	16	13.7	0.532	2	3.3	10	8.8	0.291
No	52	89.6	101	86.3		59	96.7	104	91.2	
Blood exposure during barbing practice										
Yes	42	72.4	61	52.1	0.010*	-	-	-	-	-
No	16	27.6	56	47.9		-	-	-	-	
Taking intravenous treatment										
Yes	0	0	2	1.7	0.806	1	1.6	5	4.4	0.606
No	58	100.0	115	98.3		60	98.4	109	95.6	
Conduction of surgical operation										
Yes	11	19.0	18	15.4	0.549	12	19.7	17	14.9	0.420
No	47	81.0	99	84.6		49	80.3	97	85.0	
Type of surgery:										
Major operation	1	9.0	4	22.2	0.688	8	66.7	9	52.9	0.722
Minor operation	10	90.9	14	77.8		4	33.3	8	47.1	
Endoscopic procedure										
Yes	0	0	0	0	-	0	0	3	2.6	0.505
No	58	100.0	117	100.0		61	100.0	111	97.4	
Schistosomal treatment										
Yes	6	10.3	0	0	0.002*	0	0	7	6.1	0.116
No	52	89.6	117	100.0		61	100.0	107	93.9	

[*]**There was a significant difference   Chi square test   significant at P < 0.05**
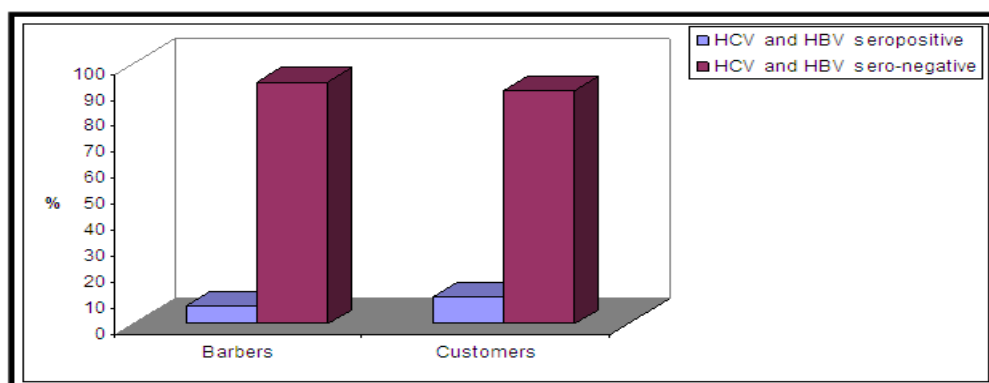
Fig. (6): Seroprevalence of HCV&HBV among barbers and customers in Assiut District, 2012/2013
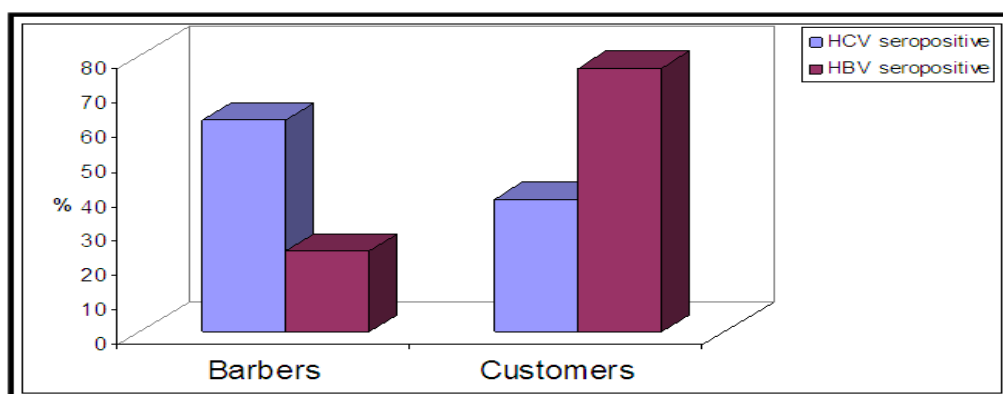

Fig. (7): Distribution of HCV&HBV seroprevalence among barbers and their customers in Assiut District, 2012/2013

Table (5): Demographic characteristics of the seropositive barbers and their customers in Assiut District, 2012/2013

Demographic characteristics	Barbers (n= 12)		Customers (n= 18)	
	No.	%	No.	%
Age (years):				
< 25 years	4	33.3	2	11.1
25 - < 30 years	2	16.7	5	27.8
30 - < 35 years	0	0	3	16.7
35 - < 40 years	0	0.0	4	22.2
≥ 40 years	6	50	4	22.2
Mean ± SD	38.54 ± 18.32		34.00 ± 9.32	
Educational level:				
Illiterate	5	41.6	2	11.1
Primary	2	16.7	3	16.7
Preparatory	0	0.0	0	0.0
Secondary	0	0.0	11	61.1
University	5	41.7	2	11.1
Marital status:				
Single	3	25	7	38.9
Married	9	75	11	61.1
Residence:				
Rural	2	16.7	13	72.2
Urban	10	83.3	5	27.8
Working experience of barbers:				
< 10 years	4	33.3	--	--
10 - < 20 years	3	25	--	--
≥ 20 years	5	41.7	--	--
Mean ± SD	19.46 ± 15.51		--	
Working in another job rather than barbing profession:				
Yes	2	16.7	--	--
No	10	83.3		

Table (6): Risky factors of the seropositive barbers and their customers in Assiut District, 2012/2013

(^) **Risky factors**	Barbers (n= 12)				Customers (n= 18)			
	Rural (n=3)		Urban (n=9)		Rural (n=14)		Urban (n=4)	
	No.	%	No.	%	No.	%	No.	%
Conduction of surgical operation	1	33.3	1	11.1	1	7.1	2	50.0
Conduction of endoscopic procedure	0	0	0	0	1	7.1	0	0
Peritoneal dialysis	0	0	0	0	0	0	0	0
Visiting a dentist	0	0	1	11.1	3	21.4	0	0
History of parenteral drug	0	0	0	0	0	0	0	0
Goza (shesha) smoking in group	1	33.3	3	33.3	2	14.3	1	25.0
Exposure to blood during barbing practice	2	66.7	8	88.9	0	0	0	0
Tattooing	0	0	0	0	0	0	0	0
History of intra-familial infection	0	0	0	0	0	0	1	25.0
Sharing personal equipments with family members at home	0	0	0	0	3	21.4	0	0
Schistosomal treatment	1	33.3	0	0	0	0	0	0

(^) More than one answer was selected

Table (7): Clinical presentation of the seropositive barbers and their customers in Assiut District, 2012/2013

| **Variables**	No. (30)			
	Barbers (n=12)		Customers (n=18)	
	No	%	No	%
S&S of HCV and HBV				
Jaundice				
Not present	12	100	18	100.0
Pallor				
Not present	12	100	18	100.0
Edema				
Present	2	16.7	0	0
Skin changes				
Not present	12	100.0	18	100.0
Liver				
Palpable	2	16.7	0	0.0
Abdominal sonography				
Liver				
Coarse & enlarged liver	5	41.7	5	27.8
Spleen				
Normal	12	100.0	18	100.0
Ascites				
Not present	12	100.0	18	100.0
Blood investigations				
Liver enzymes (AST, ALT)				
Raised enzymes	4	33.3	3	16.7
Normal Bilirubin	12	100.0	18	100.0
Normal Total Albumin	12	100.0	18	100.0
PCR				
HCV (no.=13)				
Positive (+ ve HCV)	7	53.8	5	38.5
Negative (-ve HCV)	1	7.7	0	0
HBV (no.=17)				
Positive (+ ve HBV)	4	23.5	12	70.6
Negative (-ve HBV)	0	0	1	5.9
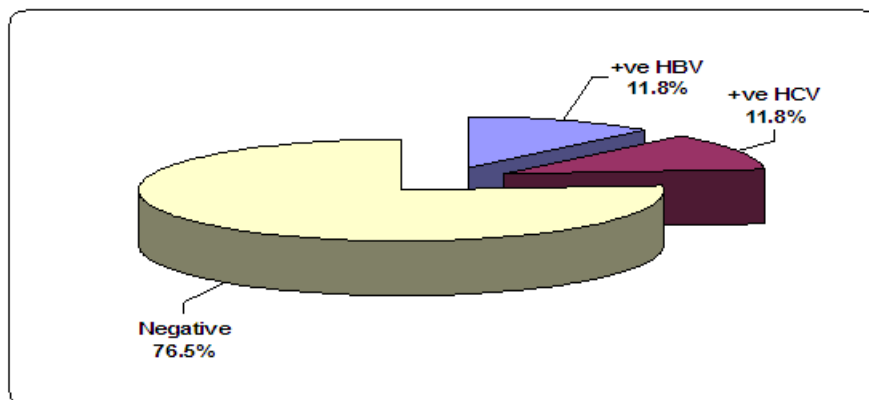
Fig (8): Familial seroprevalence of HCV and HBV among family contacts of the seropositive persons in Assiut District, 2012/2013

Table (8): Relationship between demographic characteristics of barbers and their score of knowledge about HCV and HBV in Assiut District, 2012/2013

Demographic characteristics	Score of knowledge (n=175)				P-value
	Poor (n= 155)		Satisfactory (n= 20)		
	No.	%	No.	%	
Age: (years)					
< 25	38	90.5	4	9.5	0.836
25 - < 30	51	87.9	7	12.1	
30 - < 35	18	81.8	4	18.2	
35 - < 40	16	88.9	2	11.1	
≥ 40 years	32	91.4	3	8.6	
Level of education:					
Illiterate	50	100.0	0	0.0	0.000*
Basic education	25	100.0	0	0.0	
Secondary/ higher	80	80.0	20	20.0	
Residence:					
Rural	53	91.4	5	8.6	0.411
Urban	102	87.2	15	12.8	
Marital status:					
Single	60	87.0	9	13.0	0.588
Married	95	89.6	11	10.4	
Working experience:					
< 10 years	49	90.7	5	9.3	0.378
10 - < 20 years	68	85.0	12	15.0	
≥ 20 years	38	92.7	3	7.3	

[*]**There was a significant difference   Chi square test   Significant at P < 0.05**

Table (9): Relationship between demographic characteristics of customers and their score of knowledge about HCV and HBV in Assiut District, 2012/2013

Demographic characteristics	Score of knowledge (No. 175)				P-value
	Poor (n= 141)		Satisfactory (n= 34)		
	No.	%	No.	%	
Age (years):					
< 25	30	88.2	4	11.8	0.576
25 - < 30	36	76.6	11	23.4	
30 - < 35	25	86.2	4	13.8	
35 - < 40	17	77.3	5	22.7	
≥ 40	33	76.7	10	23.3	
Level of education:					
Illiterate	23	92.0	2	8.0	0.007*
Basic education	22	100.0	0	0.0	
Secondary/higher	96	75.0	32	25.0	
Residence:					
Rural	44	72.1	17	27.9	0.039*
Urban	97	58.1	17	14.9	
Marital status:					
Single	51	83.6	10	16.4	0.458
Married	90	78.9	24	21.1	

[*]**There was a significant difference   Chi square test   Significant at P < 0.05**

Table (10): Relationship between demographic characteristics of barbers and their attitude toward HCV and HBV in Assiut District, 2012/2013

Demographic characteristics	Likert scale for attitude (n=175)				P-value
	Negative (n= 38)		Positive (n= 137)		
	No.	%	No.	%	
Level of education:					
Illiterate	13	26.0	37	74.0	0.065
Basic education	9	36.0	16	64.0	
Secondary or higher	16	16.0	84	84.0	
Working experience:					
< 10 years	8	14.8	46	85.2	0.201
10 - < 20 years	22	27.5	58	72.5	
≥ 20 years	8	19.5	33	80.5	
Residence:					
Rural	18	31.0	40	69.0	0.035*
Urban	20	17.1	97	82.9	

[*]**There was a significant difference   Chi square test   significant at $P < 0.05$**

Table (1): Illustrates that one-third of barbers and more than one-quarter of customers (33.1% and 26.8% respectively) were in the age group from 25 - < 30 years. Regarding to the educational level, it was observed that (28.6%) from the studied barbers were illiterate compared by (14.3%) of the studied customers. While, there were (53.7% and 58.3% respectively) from barbers and customers had secondary education. Concerning marital status, it was noticed that (60.6% and 65.1% respectively) from them were married.

Fig (1): This figure shows that the majority of barbers (88.6%) had poor score of knowledge about HCV & HBV. While, only (11.4%) of them had satisfactory score of knowledge regarding HCV & HBV.

Fig (2): This figure shows that the majority of customers (80.6%) had poor score of knowledge. While only (5.7%) of them had good score of knowledge about HCV and HBV.

Fig (3): This figure shows that (73.7%) of the studied barbers mentioned that blade is the most used shaving tools that may transmit infection with HCV and HBV.

Fig (4): This figure presents that more than three-quarters (78.3%) of barbers had positive attitude toward HCV and HBV.

Fig (5): This figure reveals that the vast majority of customers (95.4%) had positive attitude toward HCV and HBV.

Table (2): Regarding to the observed practice of hand washing, only (3.4%) of the rural barbers washed their hands between each customer compared with no one from urban barbers. Moreover (1.7%) of rural barbers changed the towels between each customer. Also, more than one-fifth of urban barbers (21.4%) were sweeping the shop floor after every customer with statistical difference (P=0.035). As well as, there were statistical differences between practices of rural and urban barbers regarding to (get rid of razors, using alcohol and Colonia as anti septic solution), were (P=0.002, 0.002 and 0.001 respectively).

Table (3): Illustrates that the majority of customers (87.4%) were shaving at one barber's shop. While, it was observed that more than two-fifths of them (43.4%) reported that they can shave at their home with their personal shaving equipments. In addition, it was noticed that the vast-majority of customers (98.3%) didn't bring their own shaving equipments at barber's shop.

Fig. (6): This figure shows that (10.3% and 6.9% respectively) of customers and barbers were HCV&HBV seropositive.

Fig. (7): This figure presents that more than three-fifths (61.5%) of HCV seropositive sample were barbers, while (76.5%) of HBV seropositive were customers.

Table (4): Shows that half of the studied seropositive barbers (50%) aged 40 years and more, while (27.8%) of the customers their age was ranged from 25 - < 30 years. Regarding to the educational level, it was noticed that (41.7%) of the seropositive barbers were had university education and (61.1%) of customers were had secondary education. According to residence of the seropositive barbers it was found that the majority of them (83.3%) were from urban area compared by (72.2%) of the seropositive customers were from rural area.

Table (5): Shows that one- third (33.3%) of the seropositive rural barbers were smoking goza. While there wasn't any history of taking intravenous treatment for a long period, having tattoo in the body and family history with HCV and/ or HBV among them. Moreover, more than one-fifth of rural customers (21.4%) were sharing their personal equipments with their family members at home.

Table (6): Presents that (16.7%) of the seropositive barbers has edema and palpable liver. The abdominal sonography reveals that (41.7% and 27.8% respectively) of barbers and customers has coarse & enlarged liver.

With regards to blood investigations; (33.3% and 16.7% respectively) of them had raised liver enzymes, one of them had an elevation by more than one fold.

fig. (8): Shows that (11.8%) of the family contacts of the seropositive persons was HCV and/or HBV seropositive.

Table (7): Shows that the studied barbers who aged 30 - < 35, with work experience from (10-< 20) years and living in urban area (18.2%, 12.8% and 15% respectively) were had satisfactory level of knowledge about HCV and HBV. Moreover, there was statistical significant difference between barbers' knowledge regarding HCV and HBV and their level of education (P= 0.000).

Table (8): Illustrates that the studied customers who aged 25 - < 30 and those who married (23.4% and 21.1% respectively) were had satisfactory level of knowledge about HCV and HBV with no statistical significant difference (P= 0.576 and 0.458 respectively). Moreover, customers who had secondary/higher education and living in urban area had a satisfactory level of knowledge regarding HCV and HBV with statistical significant difference (P= 0.007 and 0.039 respectively).

Table (9): Shows that the majority (82.9%) of barbers in the urban locality had positive attitude toward HCV &HBV.

Discussion

HCV is a global public health challenge that is mainly transmitted through direct exposure to infected blood such as sharing of injections, blood transfusion and accidental percutaneous exposures. These risk factors are common in certain health-care professions. Egypt is confronted with an HCV disease burden of historical proportions that distinguishes this nation from others. The prevalence among the general population in Egypt is documented to be very high. Egypt has by far the largest HCV prevalence in the world with (14.7%) of the population being antibody positive for HCV (**Alter, 2007, Razi et al, 2008 and Mohamoud et al, 2012**).

Concerning the age groups of the studied barbers and their customers: It was found that around one-third of barbers and more than one-quarter of their customers were aged 25 - < 30 years. Despite that barbing profession is an old work; but it is still present in our community. It may be related to unemployment and that general population considered it as an easy work to practice to earn money. This finding similar with **Wazir et al, 2008** who studied the awareness among barbers about health hazards associated with their profession in Pakistan and referred that half of barbers were in age ranged from (26–35) years.

The results of the current study reveled that there wasn't any statistical significant differences between the age groups of barbers and their customers and their knowledge regarding HCV and HBV.

Regarding to educational level of the participants: It was found that more than half of barbers and about three-fifths of customers had secondary education, while only (3.4% and 14.9% respectively) of them had university education. As well as more than one-quarter of barbers and less than one-fifth of customers were illiterate. This finding was in line with **Amodio et al, 2009** who found that nearly three-fifths of hairdressers had secondary education. **Wazir et al, 2008 and Chaudhry et al, 2008** found that nearly three-fifths of their studied samples were illiterate. As well as **Waheed et al, 2009** recorded that one-quarter of their sample were illiterate and more than two-fifths of **Khan et al, 2009** study sample was illiterate also.

The results of the current study pointed out that there was a significant difference between barbers' level of education and their level of knowledge regarding HCV&HBV. This finding agreed with those of **Wazir et al, 2008**, who found that there was a significant difference in level of awareness among barbers in respect of their educational status.

According to residence: It was found that two-thirds of barbers were from urban area; it was explained by that fewer number of barbers in the rural areas. It was observed that all of the visited villages were had one or two barbers' shops. This result was similar to **Jokhio et al, 2007 and Shalaby et al, 2007** who observed that the vast majority of their studied samples were from urban area. While, this result was in contrast with **Belbacha et al, 2007** who found that more than half of barbers were from rural area.

Regarding application of the educational health program: It was found the majority of the educational program sample had poor score of knowledge compared with the vast majority of them, after the application of the educational program had good score of knowledge regarding HCV&HBV. There were a statistical significant difference between mean of knowledge score of the educational program sample and their residence (P= 0.007). While there wasn't any relation with their age, level of education and marital status (P=0.966, 0.492 and 0.492 respectively).

Conclusion

The majority of the studied barbers and their customers had poor level of knowledge regarding HCV&HBV. While more than three-quarters of barbers and the vast majority of customers had positive attitude

toward HCV&HBV. It was observed that most of barbers didn't apply infection control measures during their shaving and hair- cutting practices for customers.

Recommendations

Importance of research extension in understanding and assessing knowledge and attitude about HCV and HBV health hazards associated with barbering profession. The need for ongoing training and retraining programs for barbers regarding the methods of prevention of infectious diseases such as HCV&HBV.

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