

A CROSS-SECTIONAL SCREENING OF SEROPREVALANCE OF HEPATIS B AND C AMONG PATIENTS VISITING COMMUNITY PHARMACIES OF SOUTH PUNJAB-PAKISTAN

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ABSTRACT— Hepatitis has become a foremost health concerns worldwide. Majority of the infected population remain unaware of their disease status due to non-screening practices. The aim of present study was to evaluate the prevalence of undetected cases and practices regarding Hepatitis B & Hepatitis C among patients attending community pharmacies of southern Punjab, Pakistan. A cross sectional study was conducted for the duration of three months from January to March, 2017 using a structured, validated questionnaire. Rapid diagnostic kits were utilized for screening of patients from selected community pharmacies of two big cities of South Punjab, Pakistan. Descriptive and inferential statistics were applied for data analysis by using SPSS version 20.0. P value <0.05 was considered to be statistically significant. Among total 794 respondents, 565 (71.2%) were males and 229 (28.8%) were females. Prevalence of undetected HBV cases was 2.01% (n = 16) and for HCV was 5.41% (n = 43). Results showed poor practices of respondents with mean practice score of 2.54/6 (± 1.581). Study emphasized the need of educational programs along with motivational campaigns to persuade people for regular screening of HBV & HCV that will prove beneficial in early diagnosis and management of the disease.

KEYWORDS: Hepatitis, Practice, Screening, Community Pharmacy, Pakistan

1. INTRODUCTION

Viral hepatitis is an infection that is threatening lives of millions of people. An estimated 325 million people suffering with chronic hepatitis in 2015 and about 1.34 million people died of this viral infection in the same year [1]. Hepatitis B (HBV) and hepatitis C (HCV) are considered as the leading cause of severe liver sickness including hepatocellular carcinoma and end stage liver disease [2]. Overall estimated prevalence of HB is reported to be 3.6% with highest in East Asia and Sub Saharan Africa to lowest in North America and Western Europe [3], [4] and Asia pacific region has reported the highest prevalence of HBV & HCV, globally with 74% deaths. According to WHO, approximately four million people are suffering from HBV infection in Pakistan [5].

In developing countries, viral hepatitis is a key factor for high mortality and morbidity [6]. Among these developing countries, Pakistan carries a high burden of both HBV and HCV infection and is categorized as a country of intermediate risk. Pakistan medical and research council conducted a study in 2007-2008 that showed 13 million Pakistanis suffering from HBV and HCV with 2.5% HBV and 4.8% HCV carriers [7]. It is well established that majority carriers of viral hepatitis remain unaware of their infection due to asymptomatic nature of the infection and later contribute in a significant rise in the disease burden [8]. According to a report 45% to 85% cases of viral hepatitis remain undiagnosed, even though diagnostic laboratories are available. The main reasons listed for this issue are cost, uncomfortable environment and far location of these laboratories [9].

To address these barriers provision of Point of Care (POC) testing facility to surrounding community has been proved as a better choice. POC testing can be initiated for HIV, hepatitis, influenza at community pharmacies with various advantages over other settings. It can prove cost effective, cover a large population, limit the use of antimicrobials and can offer comfortable and confidential environment [10].

Change in poor practices can also lead to success in defeating the vigorous transmission of infectious diseases [11]. Various studies reported from different corners of world to assess the practices towards specified disease in different populations and in the same pattern a number of studies are also reported from Pakistan with the aim to contribute in development and implementation of new interventions to bring down the disease burden [6], [12- 14].

In Pakistan there is a dire need of involving community pharmacies in initial screening of disease. For better outcomes pharmacists can be involved in the provision of disease management interventions by initiating educational programs, conducting screening and by making referrals to hospitals for early management [8].

As there are limited healthcare facilities for general population especially in the underdeveloped areas like South Punjab region of Pakistan for early screening of viral hepatitis so current study holds its importance in highlighting the role and feasibility of screening services in community pharmacies for early screening and referrals to hospital for earlier treatment.

2. METHOD

2.1 Aim of the study

The aim of this study was identification of seroprevalance of hepatitis b and c and assessment of practices among patients visiting selected community pharmacies in two big cities of southern Punjab-Pakistan.

2.2 Study design

A quantitative, cross sectional study was conducted by using a structured, validated questionnaire for assessment of practices and rapid diagnostic kits were utilized for screening of HBV & HCV. The data were collected from two community pharmacies having high patient flow in the two most populated cities (Bahawalpur and Dera Ghazi Khan) of south Punjab region, Pakistan. Screening test for HBV & HCV was offered by direct advertisement at the pharmacy premises and popular places of the respective city.

2.3 Sample size and population

Total 794 individuals participated in the study. All the individuals who visited the selected community pharmacy during study period 1st January, 2017 to 31st March, 2017 at a specified time 4PM to 9PM (as

these are considered as peak hours when most of the people visit pharmacies) were considered for this study. People aged 15 years and above irrespective of gender, not screened ever or screened negative not less than six months before the current study and were apparently healthy both mentally and physically were included in the study. All individuals who were previously diagnosed or having HB or HC or not fit mentally/physically and those who were not permanent residents of South Punjab region were excluded from study.

2.4 Data collection tool

For the assessment of practices of patients, a well-structured questionnaire was developed after literature review [15- 19]. Questionnaire comprises of two sections; demographic characteristics of respondents and practices. To evaluate the practices, 6 questions were asked on dichotomous response scale (Yes or No) for both hepatitis B & C, except two questions focused on screening and vaccination of hepatitis that were asked separately.

2.5 Tool Validation

A panel of experts checked the questionnaire for face and content validity. Internal consistency of the tool 1 was checked on 10% of total sample calculated for pilot study and was not included in the final analysis. Cronbach coefficient α value was 0.674 on 6 items tested. Study tool 2 was validated by confirming the screening test results by other confirmatory tests ELISA/PCR method. To check the internal reliability pilot study was conducted on limited respondents and changes were made on the basis of results of the pilot study.

2.6 Hepatitis B(HB) and Hepatitis C(HC) screening

A standard rapid diagnostic test kit (faStep, Polymed Therapeutics, INC. USA) used for the detection of HBs Ag and anti-HCV in blood sample as similar screening kits were used in various other studies [20]. All protocols were followed strictly as mentioned by the manufacturer to perform the test.

Participant blood sample was taken and preceded for HBV & HCV screening test. Rapid diagnostic test kit took about 10–15 minutes to show results, during that time face to face interview of the respondent (under test) was conducted to fill the designed questionnaire. Test result was given on the spot on a self-generated report card, all participants with positive result for HBsAg or anti-HCV or both were further referred to consult Physician/Hospital with recommendation of confirmatory test ELISA/PCR. Later, these respondents were contacted telephonically to know their status about confirmatory test results within 10 working days, started after initial screening. Those who had gone for confirmatory test were recorded for their results and were contacted again after 10 days to know their treatment status. Each positive respondent was contacted for at least 3 times periodically with 10 day's interval and their responses were recorded. After 3 attempts of contact if positive respondent denied to respond he or she was declared non respondent.

2.7 Data Analysis

Data analysis was performed by using the statistical package for social sciences SPSS version 20.0. Descriptive statistics (frequency, percentage, means (\pm S.D) was applied to interpret the demographic characteristics. To illustrate the association between independent and dependent variables inferential statistics (chi square test) was applied with p values < 0.05 to be considered as statistical significant level. Difference in score of respondent's practices behavior was calculated by non-parametric tests (Mann – Whitney U test & Kruskal Wallis test).

3. RESULTS

3.1 Demographic characteristics of respondents

Among 794 respondents, 494(62.2%) individuals were from Bahawalpur and 300(37.8%) from D.G Khan. Mean age of the participants was 33.24 (± 13.143) years with maximum participants ($n = 536$, 67.5%) in age category 18-40 years. Among 794, 565(71.2%) were males and 229(28.8%) were females. Among study participants 238(30%) were unemployed. Almost all the participants 89.2% ($n=708$) were from urban areas and more than half 57.6% ($n=457$) were married. Majority of the respondents 40.2% ($n = 319$) had graduation level education (Table 1).

3.2 Assessment of respondents practices

Among all the participant's majority had never gone for screening of HB and HC ($n = 520$, 69.1%) and ($n = 525$, 69.8%) respectively. Only a small proportion of participants; ($n = 161$ 21.4%) were vaccinated against HB. Significant population ($n = 653$, 86.8%) reported that they always ask for the use of new blades and syringes whenever required. Majority of the respondents 621 (82.6%) said that they always used to ask for screening of blood and blood products before donation or transfusions. Interestingly 631 (83.9%) participants had never participated in any educational program regarding hepatitis B or C awareness (Table 2).

3.3 Evaluation of practice score of respondents among categorical variables

Mean practices score was calculated by using descriptive statistics. A significant difference ($p = 0.024$) in practice score of respondents was observed based on their residence area as residents of Bahawalpur had good practices as compared to D.G Khan residents. However, gender and locality (rural & urban) showed negligible difference in practice score (p -value 0.889, 0.475) respectively (Table 3). When practice score based on age of respondents was determined, good practice behavior was significantly ($p = 0.013$) found among old age (>60 years). Among all categories of employment, employed respondents were found more keen towards good practices regarding disease ($p < 0.001$). Based on relationship and educational status higher practices level was reported in married respondents and in those who were postgraduates with p values 0.008 and < 0.001 respectively (Table 3).

3.4 Assessment of respondents practices level

Majority of the participants ($n = 589$; 74.2%) were found experiencing poor practices while only a small proportion of respondents ($n = 205$; 25.8%) were recognized with good practices. Mean knowledge score of respondents practices behavior was 2.54/6 (± 1.581) (Table 4).

3.5 Screening of Hepatitis B & C

Out of 794 participants, 17 (2.1%) were declared positive for the presence of HBV infection, and 44(5.5%) for HCV infection. Major proportion of participants 11(2.2%) who were tested positive for HBV infection belonged to Bahawalpur, similar for HCV infected patients ($n = 31$; 6.3%). Majority patients infected with HBV were males (2.5%) as compared to HCV where higher percentage of infection were in females (5.7%). Higher percentage of HBV (2.8%) were in age group < 18 years whereas 26 (4.9%) of HCV were 18 – 40 years old. Percentage of HBV in unmarried participants was 3.3% whereas percentage of HCV was higher in married (7.9%). When education status was compared percentage of HBV was higher in graduates (2.5%) followed by matric/intermediate (2.1%) and illiterate (2.0%). Percentage of HCV was higher in those who were graduates (4.7%). Participants with low monthly income ($< 13,000$) were screened more positive 13 (3.3%) with HBV infection while HCV was more prevalent in 13,000 – 20,000 income group (7.7%) (Table 5).

3.6 Referrals to Hospital for confirmatory testing and treatment initiation

HBV positive 17 (2.1%) and HCV positive individuals in initial screening were referred to physician or hospital (hepatic care clinic) with provision of necessary guidance for confirmatory test and treatment. All individuals who were referred for further investigations contacted telephonically to record their confirmatory test result and treatment status with a response rate of 100%. Out of 17 individuals who were found positive for HBV, 16 were confirmed by the results of confirmatory test except one who was reported negative for HBV making overall prevalence 2.01%. Similarly 43 individuals were confirmed positive for HCV by confirmatory test with negative result in 1 individual that made overall prevalence of 5.41%. Of 16 confirmed cases of HBV 13 (81.2%) individuals initiated treatment for HBV and among 43 confirmed individuals with HCV 33 (76.7%) individuals started treatment for HCV eradication. Different reasons for not starting proper treatment were recorded as poverty, belief in other treatment options (spiritual, herbal, homeopathic) and lack of education. Response rate of individuals was 100% as all of them recorded their status within defined time period (10 – 30) days (Table 6).

4. DISCUSSION

The present study was aimed to figure out the prevalence of undetected cases of viral Hepatitis B (HB) and hepatitis C (HC) among residents of south Punjab and to highlight the role of community pharmacy and community pharmacist in detection of new cases and making referrals to hospital. Limited literature is available regarding practices evaluation and POC testing of HBV & HCV in Pakistan.

Current research results revealed majority of the participants failed to show good practices towards disease. Majority of the participants were unaware of their disease status as they had never gone for the screening of HBV & HCV and it was found strongly associated with employment and relationship status of respondents. Although the screening practice of participants was much better in comparison to other studies but was not up to the mark in any way. In this context a similar study showed worst practice among healthy population of Quetta where 96.9% of participants had never tested for HBV status [21]. Similar poor practices were reported by many other studies around the globe [19], [22], [23]. Contrary to this good practice regarding screening of HBV& HCV was reported by a study conducted among medical students where 55.3% students had undergone screening. Difference in practice can be linked with more awareness and professional demand of medical students [14].

When study population was investigated for vaccination status against hepatitis B, only a small proportion 21.4% were found vaccinated that with significant impact of education, employment, marital status and monthly income of study participants as highly educated, married, professional employed and those with high income were seen with good vaccination status. Somewhat similar result was reported by a study in Saudi Arabia where 24.1% participants had completed vaccination course against HB [19]. About 81.9% of individuals with positive vaccination status were reported by a study conducted among clinicians and medical science students [24]. Good practice regarding vaccination against disease can be linked to individuals education and place of job as higher practice was reported among individuals who were either medical students, doctors or employ of hospital in any way [14], [24], [25].

In present study majority of participants were noted with a habit of asking for sterilized instruments i.e. needles, syringes, barber blades and blood screening whenever required. This finding was far better as compared to other studies conducted among general population and adolescents of Quetta where participants had poor practice in this regard [21], [22].

Health education programs provide awareness about general knowledge of disease and improve practices of people towards disease. In present study participation of population in such programs was recorded very

low as only 16.1% individuals had ever participated in health education program related to under discussion disease. Another study from same country showed more poor response regarding participation in health education programs [21]. Unlike current finding much better participation rate was reported by another study where 61% participants had participated in program related to HCV awareness and majority of them showed interest of participation in future programs. On the other side a large population; 68% of individuals confirmed their previous participation in health education program related to HCV [26].

In the present study estimated prevalence of HBV and HCV was somehow similar with results of only national level study conducted a few years ago by Pakistan medical and research council that showed prevalence of HBV & HCV as 2.5% and 4.8% respectively [27]. Current result showed comparatively low prevalence reported by a study conducted among general population of the same region (South Punjab, Pakistan) that was 2.3% for HBV and 7.8% for HCV. Despite of this difference both studies had similar trend of prevalence i.e. low prevalence of HBV and high prevalence of HCV. Variation in results can be attributed to the difference in sample size of the study [28]. Contrary to this another study conducted in 12 districts of south Punjab, Pakistan; reported much higher prevalence of HBV (5.9%) and HCV (2.5%). The disparity between the results can be explained by the fact that it was conducted on large population as sample was drawn from 12 districts and recruited only young adults. Secondly, not satisfactory but efforts were also made at provincial level to cope with the disease by initiating Hepatic care clinics [29].

The current study results demonstrated point of care screening technique as a successful tool for detection of new cases of HB & HC. All the positive screened cases were contacted successfully within the specified follow up period and their confirmatory test status was noted. Majority of the positive detected cases mentioned that they have contacted their healthcare provider for treatment initiation. Identical to the current research a study was reported from United States that was performed recruiting a specific birth cohort and high risk individuals at a chain pharmacy located in 9 different states with sample size of 1296 individuals. Results declared 8% individual anti-HCV positive; among these individual 88% were contacted by their management team and finally 52% confirmed their HCV RNA testing status [20]. A survey revealed; uncomfortable environment at clinic, high cost of the test in context of these barriers numerous studies highlighted the role of community pharmacies in minimizing these barriers and to promote public health. Globally POC testing for various diseases is recognized and different countries reported their feasibility reports that showed a bright picture [20], [30], [31].

Pakistan is a country with limited health resources and high population density so it is difficult for majority of the individuals to afford different screening test, treatment cost and hepatitis complication. A study recommended the need for establishment of regional laboratories and treatment center to facilitate the general public of that region [7]. Similarly keeping in view the disease burden and public related barriers to screening, community pharmacy can be utilized for early screening of hepatitis by pharmacist that may prove helpful in detection of new cases with minimum cost and confidentiality and thus contribute in defeating disease by making referrals to hospitals or treatment centers.

5. CONCLUSION

The findings showed poor practices of respondents that reflect the gaps in knowledge and awareness. Prevalence of HBV & HCV showed a high burden of disease but on the other hand majority of the participants who were screened positive for either infection HBV or HCV willingly followed instructions of pharmacist and consulted their respective physician for confirmation and treatment initiation that reflects the interest and trust of people on pharmacist. So, it is not erroneous to say that involvement of community pharmacies in detection of new cases of HBV & HCV can play imperative role in defeating this disease

from Pakistan.

DECLARATIONS

Ethical Approval and consent for publication

The ethical approval to conduct this research was taken from research and ethical committee of The Islamia University of Bahawalpur. Study objectives were explained to all participants and their verbal consent was taken.

Availability of data and materials

All the data generated or analyzed are included in the manuscript.

Competing Interest

Authors declared no conflict of interests.

Funding

No funding was acquired for this study

Authors Contribution

All the authors contributed equally in the manuscript

Acknowledgement

We acknowledge the participation of each individual in this study.

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Table 1: Demographic data of participants

Demographic Characteristics	Frequency	Percentage	
	(n=794)	(%)	
City	Bahawalpur	494	62.2
	D.G Khan	300	37.8
Gender	Male	565	71.2
	Female	229	28.8

Age (Mean, ±S.D)	33.24, ±13.14		
Age	<18	36	4.5
	18-40	536	67.5
	41-60	203	25.6
	>60	19	2.4
Employment status	Employed	226	28.5
	Un-employed	238	30.0
	Self-employed	111	14.0
	Others	219	27.6
Relationship status	Single	330	41.6
	Married	457	57.6
	Divorced/separated/widowed	07	0.9
Locality	Rural	86	10.8
	Urban	708	89.2

Table 2: Practices behavior of respondents

Statement	Response	
	Yes	No
	n (%)	n (%)
Have you ever gone for screening of Hepatitis B?	232 (30.9)	520 (69.1)
Have you ever gone for screening of Hepatitis C?	227 (30.2)	525 (69.8)
Do you get vaccinated against Hepatitis B?	161 (21.4)	591 (78.6)
Do you ask for the use of safe and sterilized	653 (86.8)	99 (13.2)

equipment/tools (needles/ syringes, barber blades, ear / nose piercing equipment, surgical equipment and dental equipments)?		
Do you ask for blood screening before blood transfusion?	621 (82.6)	131 (17.4)
Have you ever participated in health education program related to Hepatitis?	121 (16.1)	631 (83.9)

Table 3: Difference in practice score of respondents among categorical variable

Variable		Frequency	Mean rank	<i>p</i> -value
City	Bahawalpur	494	411.30	0.024*
	D.G Khan	300	374.77	
Gender	Male	565	398.20	0.889*
	Female	229	395.78	
Locality	Rural	86	413.59	0.475*
	Urban	708	395.55	
Age	<18	36	335.08	0.013**
	18-40	536	387.39	
	41-60	203	426.70	
	>60	19	489.05	
Employment	Employed	226	461.12	<0.001**
Status	Unemployed	238	346.25	
	Self employed	111	424.13	
	Others	219	374.04	

Relationship status	Single	330	368.47	0.008**
	Married	457	418.34	
	Divorced/Widowed/Separated	7	405.86	
Educational Status	Illiterate	51	298.62	<0.001**
	Primary or above	77	318.97	
	Matric/Intermediate	285	379.89	
	Graduation	319	434.78	
Monthly Income	Post-graduation	62	465.50	<0.001**
	<13,000	394	355.38	
	13,000-20,000	169	397.98	
	21,000-30,000	82	459.51	
	>30,000	149	474.20	

* p value is determined by Mann Whitney test

**p value is determined by Kruskal Wallis test

Table 4: Respondents practices level

Level of Practices	Scoring Criteria	n (%)
Poor Practices	<4	589 (74.2)
Good Practices	≥4	205 (25.8)
Mean Practices Score		2.54 (±1.581)

Note: Criteria for practices scoring was adopted from [21].

Table 5: Hepatitis B and C screening results

Variables	Screening of Hepatitis B		Screening of Hepatitis C	
	Positive	Negative	Positive	Negative
	n (%)	n (%)	n(%)	n(%)

City	Bahawalpur	11 (2.2)	483 (97.8)	31 (6.3)	463 (93.7)
	D.G Khan	6 (2.0)	294 (98.0)	13 (4.3)	287 (95.7)
Gender	Male	14 (2.5)	551 (97.5)	31 (5.5)	534 (94.5)
	Female	3 (1.3)	226 (98.7)	13 (5.7)	216 (94.3)
Age	<18	1 (2.8)	35(97.2)	0 (0.0)	36 (100)
	18-40	14 (2.6)	522 (97.4)	26 (4.9)	510 (95.1)
	41-60	2 (1.0)	201 (99.0)	18 (8.9)	185 (91.1)
	>60	0 (0.0)	19 (100)	0 (0.0)	19 (100)
Employment	Employed	2 (0.9)	224 (99.1)	18 (8.0)	208 (92.0)
Status	Unemployed	6 (2.5)	232 (97.5)	6 (2.5)	232 (97.5)
	Self employed	1 (0.9)	110 (99.1)	7 (6.3)	104 (93.7)
	Others	8 (3.7)	211 (96.3)	13 (5.9)	206 (94.1)
Relationship status	Single	11 (3.3)	319 (96.7)	6 (1.8)	324 (98.2)
	Married	6 (1.3)	451 (98.7)	36 (7.9)	421 (92.1)
	Divorced/Widowed/Sepa rated	0 (0.0)	7 (100)	2 (28.6)	5 (71.4)
Education	Illiterate	1 (2.0)	50 (98.0)	6 (11.8)	45 (88.2)
	Primary or above	1 (1.3)	76 (98.7)	10 (13.0)	67 (87.0)
	Matric/Intermediate	6 (2.1)	279 (97.9)	10 (3.5)	275 (96.5)
	Graduation	8 (2.5)	311 (97.5)	15 (4.7)	304 (95.3)
	Post-graduation	1 (1.6)	61 (98.4)	3 (4.8)	59 (95.2)
Monthly income	<13,000	13 (3.3)	381 (96.7)	18 (4.6)	376 (95.4)
	13,000-20,000	1 (0.6)	168 (99.4)	13 (7.7)	156 (92.3)
	21,000-30,000	1 (1.2)	81 (98.8)	6 (7.3)	76 (92.7)

