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Research Article

Sero-prevalence of hepatitis C virus among Patients attending dental clinics in Khartoum- Sudan

Khadeejah Mohammed Mohammed Othman*, Wafa Ibrahim Elhag*.

Microbiology Department,Faculty of Medical Laboratories Sciences,

Al- Neelain University, Sudan.

ABSTRACT

This study was carried out to detect frequency of Hepatitis C virus (HCV) among patients attended dental clinics of Khartoum-Sudan, and to determine the relationship between the presence of HCV and certain factors such as gender, age, social status, history of haemodialysis and blood transfusion .it was descriptive cross-sectional study conducted between January-March 2015 . A total of 90 apparently healthy individuals who visited dental clinics , (43 males and 47 females)were enrolled. Serum specimens were tested by ELISA, sero prevalence of HCV was 0.00%.

Keywords : frequency, hepatitis C, ELISA ,dental clinics, Khartoum -Sudan.

INTRODUCTION

hepatitis continues to have an impact on the practice of dentistry, Possible transmission in the dental setting, management of the chronically ill and the legal issues related to the treatment of infectious patients who may act as source of spreading of the infection among dental health care workers and other patients in dental clinics ,such patients are unaware of their status because of long incubation period and post infection window period during which antibodies cannot be detected [1,2].

Hepatitis C is recognized as an important global infectious disease affecting primarily the liver, caused by hepatitis C virus (HCV), with more than 170 million people are chronically infected [3]. Hepatitis C is generally asymptomatic with up to 80% of infected cases which will progress to persistent infection. About 15-20% of chronic HCV infection progressed to cirrhosis and 1 to 4% are found to be an annual risk of developing hepatocellular carcinoma within 20-30 years [3,4]. Blood, blood –products and intravenous drug abuse (IV) are related with the transmission of this virus, Probabilities due to sexual and interfamilial transmission are somehow low [5] . Surprisingly, Nokhodian and his colleagues (2012) stated that HCV transmission may also be acquired through non-parenteral and non- sexual routes [6] . The presence of viral hepatitis C particles in oral fluids has been demonstrated by many authors and this may indicate that transmission via saliva and gingival cervical fluid might occur [7,8] . Up to 40% of patients infected with HCV may have non identifiable routes of viral acquisition. Dental extraction may be one of these risk factors [9] . The non-existence of a good patient's history in as well as in private dental clinics and hospitals, unsterilized dental and medical equipment, used syringes and unsterilized instruments are common causes of the spread of HCV[10] .

Hepatitis C is very important for dentists because of its transmission route. The dentists are particularly at risk because of exposure to the oral secretions and blood of potentially infectious patients[11].There is no published data are available regarding the frequency of HCV among the dental patients in Sudan. The aim of this study to detect frequency of Hepatitis C virus (HCV) among patient who had attended dental clinics of Khartoum-Sudan, and to determine the relationship between the presence of HCV and certain factors such as gender, age, social status, past history of haemodialysis and blood transfusion.

MATERIALS AND METHODS

This was descriptive- cross sectional study which had been conducted in Khartoum state during period from January to March 2015, 90 patients who attended dental clinics for extraction and other surgical procedures such as diagnostic biopsy prior to oral and maxillofacial surgical procedures were enrolled, Data was collected by using direct interviewing questionnaire; ethical clearance was obtained from research ethical committee of faculty of graduate studies Al-Neelain Umiversity and Ministry of Health Khartoum state,written consent also was obtained from each patient.

Experimental work

Samples collection:

blood samples were collected from patients, under direct medical supervision by medial vein puncture using 5 ml syringe into plain tube to obtain serum by centrifugation at

5000 rpm for 10 min. serum was kept in -20°C till serological study was performed.

Specimens were processed by Enzyme linked immune sorbent assay (ELISA) (4th generation ELISA) (fortress diagnostics,UK) for detection HCV antibodies.

Enzyme linked immune sorbent assay for detection HCV antibodies:

All reagents and samples were allowed to reach room temperature for 15minutes before use washing buffer was prepared 1:20 from buffer concentrate with distilled water. 100µl of sample diluents was added into appropriate wells except the blank well and negative well. 20µl from each sample was added to the appropriate wells and mixed by pipette repeatedly until liquids turn blue. 20µl from negative and positive control was dispense and added to the negative and positive wells separately without dispensing

liquid into the blank control well. Microtiter wells was flicked for 30 seconds and mixed well, then plate was covered and incubated for 30 minutes at 37° C .plate was taken out and wash buffer was added to each well (washing 1) and aspirated off after 20 seconds. This step was repeated for 5 times until each well become dry, and 50µl of HRP-Conjugate Reagent was added in to each well except the blank, the plate was mixed well and covered with the plate cover and incubated for 30 min at 37°C.

The plate cover was removed and discarded. The liquid was

aspirated and each well was rinsed in wash buffer . This step was repeated for 5 times until each well become dry (washing 2).

50µl of substrate A and 50µl substrate B solution were added in to each well including the Blank and mixed by tapping the plate gently. The plate was incubated at 37°C for 15 min. 50 µl Stop solution was added into each well and mixed gently.

Measuring the absorbance: The plate reader was calibrated with blank well and the absorbance was read at 450nm. The results were calculated by relating each sample optical density

(OD) value to the Cut off value of plate. Calculation of cut off (C.O) value.

C.O = *Nc*2.1

*Nc= the mean absorbance value for the three negative controls.

The absorbance was read with micro well reader at 450nm.

Interpretation of Results:

Negative results: samples giving absorbance less than Cut-off value are negative for this assay. Positive result: sample giving absorbance equal to or greater than Cut-off considered initially reactive. Borderline: sample with absorbance to Cut-off value are considered borderline and retesting of these samples in duplicate is recommended.

Data analysis: Data was analyzed by SPSS (Statistical Package of Social Science) software program version 16.

RESULT

A total of 90 patients who attended dental clinics during the period from January-March 2015, consented to the study were included, study subjects were 43(47.8%) males and 47(52.2%) females .The average age of patients was 42.27 years (range from 12 to 80 years) ,most of patients 33 (36.7%) were belonged to the age group (31-50) fig(1). The overall result showed that no one had HCV antibodies (0.00%). Study population were divided into 2 groups 59 (65.6%) were married and 31(34.4%) were single, most of study population where from Khartoum locality (28(31.1%)), table (1). fig(2) summarized the demographic data of study population, regarding their occupation, most of them were housewife 26(28.9%). Regarding clinical data,16 (17.8%) had a history of hepatitis, 87.5% were did not know type of hepatitis they got , most of study population had no history of surgical operation (57 (63.3%)) , 69(76.7%) had no history of blood transfusion, 69(76.7%) had no history of tattooing. table(2). all study population had neither history of haemodialysis nor organ transplantation.

DISCUSSION

More than 170 million people are infected with HCV, causing over 350,000 deaths annually[3] .Some health care interventions may act as risk factors for HCV infection and dental procedures may be one of these[12]. Dental procedure is one of the major source of exposure for HCV transmission (39.7%)[13] . The present study result revealed 0.00% seropositivity**.** when compared with other studies in Sudan , it is slightly similar to the result obtained by Isam-*et al* (2001) a 0.4% of HCV antibodies was detected among blood donors in Khartoum state [14] and 0.6% among pregnant women in Khartoum –state in study conducted by Elsheikh- *et al* (2007) [15]. However, the obtained seropositivity was lower than the result of 4.5% obtained by Mudawi- *et al* (2007) among patients with hepatosplenic schistosomiasis in Khartoum state [16] and 1.3% among pregnant women in central Sudan in study conducted by Osman- *et al*(2014)[17] . Other reports among the general population from Western and Southern Sudan showed a prevalence of 2-3% [18,19] . the few studies on HCV infections in Sudan demonstrated a low seroprevalence ranging from 2.2% in Gezira[20] To 4.8% in patients with schistosomal periportal fibroses [16].the present findings (subjects had no history of haemodialysis) was extremely lower than a study conducted by El-Amin – *et al* (2007)among haemodialysis patients in Khartoum –state in which a prevalence of 23.7% was reported[21] and study conducted by Nalam- *et al*(2014) in which a 39.8% of HCV antibodies was detected among patients undergoing renal dialysis, this higher incidence was significantly associated with higher duration of dialysis[22] , also the present finding was lower than seroprevalences of HCV noted in other African countries such as Ethiopia (2%)[23], central African republic (5%)[24]and Libya (7.9%)[25].Generally the serofrequency of HCV in Sudan is low compared with neighboring countries ,Egypt the northern neighboring country to Sudan reported the highest HCV seroprevalence in the world , 12 to 31 % [26,27,28, 29] , UK have high rate of HCV which is 214,000 individuals have long-term (chronic) infection with hepatitis C in study conducted by Annastella- *et al*(2014) [30] ,also 4.1% and 2.1% of HCV antibodies was reported among transfused patients and untransfused blood donors respectively in study conducted by Balogun-*et al* (2014) [31.]

CONCLUSION

This study revealed none HCV seropositivity among dental patients **,** the discrepancies of this result may be due to small sample size and differences in the used techniques , for this large scale screening is recommended.

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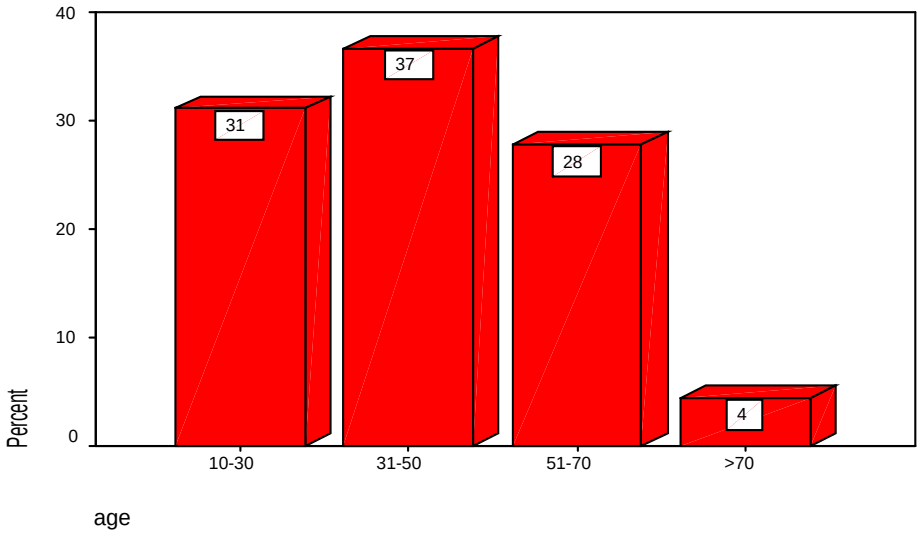

Fig 1
Distribution of study population(n=90) according to their age.

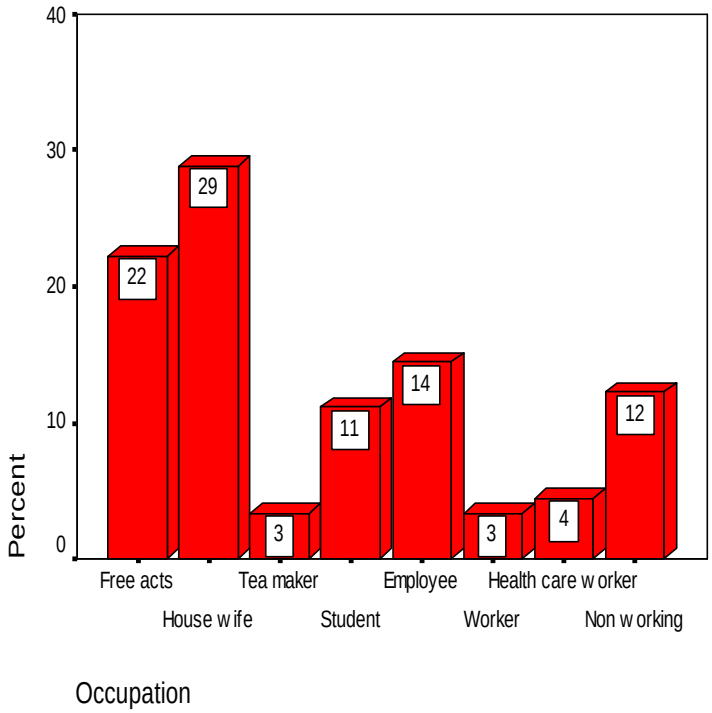

Fig 2
Distribution of study population (n=90) according to their occupation.

Table 1
Distribution of study population (n=90) according to their residence.

		Frequency	Percent
Valid	Khartoum	28	31.1
	Omdurman	16	17.8
	Bahri	25	27.8
	Out of Khartoum	21	23.3
	Total	90	100.0

Table 2
Clinical data of study population (n=90).

Clinical data	yes	No	Total
History of surgical operation	**33(36.7%)**	**57(63.3%)**	**90**
Family history of hepatitis	**14(15.6%)**	**76(84,4%)**	**90**
History of blood transfusion	**21(23.3%)**	**69(76.7%)**	**90**
History of tattooing	**21(23.3%)**	**69(76.7%)**	**90**

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