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Mahfouth Abdalla Bamashmus

Faculty of Medicine and Health Sciences, Sana'a University

Ahmed Mousa Abdulrahim

Nurseen Charity Foundation of Community Ophthalmology, Cairo, Egypt

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Frequency of Hepatitis B, Hepatitis C and Human Immunodeficiency virus in patients undergoing cataract surgery

Mahfouth Abdalla Bamashmus*

Ahmed Mousa Abdulrahim**

Abstract

The aim of this study is to assess the frequency of Hepatitis B (HBV), Hepatitis C (HCV) and Human Immunodeficiency (HIV) viral infections in patients undergoing cataract surgery. This study was conducted among 1,203 patients above the age of 17 years who were scheduled for cataract surgery at Yemen Magrabi Hospital from January 1st, through December 31st, 2012. Patients had investigations for HBV, HCV and HIV and findings were analyzed. The total number of patients screened was 1,203 including 603 (51.1%) males and 600 (49.9%) females. The mean (\pm SD) age was 59.96 ± 12.39 years. Out of the 1,203 cataract patients booked for surgery, 130 (10.8%) turned out to be positive for HBV, HCV and HIV. The total prevalence of HBV and HCV was found to be 81/1203 (6.7%) and 49/1203 (4.1%) respectively. Only one patient was found with a co-infection with both HBV and HCV. While only one patient (0.83%) was HIV positive. We conclude that the high prevalence of 10.8% of HBV and HCV among cataract surgery patients suggests that pre-operative viral screening for all patients should be mandatory prerequisite for conducting the surgery. A solid policy outlining preventive practices are badly needed to control this phenomenon and prevent its adverse consequences.

Key Words: Hepatitis B, hepatitis C, HIV, cataract surgery, screening

Introduction:

In Yemen, the frequency of Hepatitis B virus (HBV) ranges from 8 – 12% while hepatitis C virus (HCV) infection ranges from 1.7 – 2.7% in the general population with variations in different parts of the country [6, 11]. There is a considerable probability that patients undergoing any surgical procedure may have such infections which may require special precautions. Health workers are at a relatively high risk of developing these viruses where a study in Yemen showed that 9.9% of health workers tested were positive for hepatitis B surface antigen (HBsAg) and 3.5% had hepatitis C antibodies (anti-HCV) [3, 19].

The increased prevalence of HBV, HCV and HIV are of global interest where it is considered as a major public health problem especially in developing countries such as Yemen. Moreover, both HBV and HCV are among the leading causes of morbidity and mortality worldwide. Around 80% of affected patients reside in Asia [14] and 50 million new cases of HBV are commonly diagnosed annually [16]. Infection with HBV is endemic worldwide and is responsible for an estimated 1-2 million global annual deaths [14].

Moreover, the World Health Organization (WHO) estimates show that around 170 million

people (3% of the world population) are infected with hepatitis C virus (HCV) [20] whereas, 130 million of whom (76.5%) are chronic HCV carriers and are at high risk of developing liver cirrhosis, portal hypertension, ascites, bleeding esophageal varices and liver cancer. [20] The prevalence of HCV is commonly lower than that of HBV. However, this fact is quite region-specific. For example, in Pakistan and Egypt, the prevalence of HCV is much higher than that of HBV.[7, 8]. The common risk factors for encountering HBV and HCV may include; old age, being female, certain occupations and bad hygiene [5, 9].

Epidemiologically, both HBV and HIV can be contracted through the blood, semen, vaginal fluids, and other body fluids of an infected individual having either hepatitis B or HIV infections. However, HCV can only be contracted through blood to blood contact [1]. Since HBV, HCV and HIV viruses are all blood borne, they are commonly transmitted by transfusion, use of infected needles, surgical and dental instruments, and barber shaving equipment [10]. Objects contaminated with blood and other body fluids of patients suffering from HBV, HCV and HIV constitute an occupational health hazard to other exposed health care personnel. Medical doctors, particularly surgeons and paramedical staff are at high occupational risk of encountering these infections through needle injury or direct transfer of the virus through cutting skin [17].

The aim of the current study is to estimate the

* Eye Department, Faculty of Medicine and Health Sciences, Sana'a University, Republic of Yemen.

** Nourseen Charity Foundation of Community Ophthalmology, Cairo, Egypt. Received on 22/9/2018 and Accepted for Publication on 31/12/2018

prevalence of Hepatitis B, Hepatitis C and HIV among cataract patients booked for surgery in Sana'a, Yemen.

Patients and method:

The current study follows an observational descriptive study design based on laboratory finding of all patients admitted for cataract surgery at Yemen Magrabi Eye Hospital in Sana'a from January 1st, and during December 31st, 2012. All cataract patients listed for surgery were screened for Hepatitis B (HBV), Hepatitis C (HCV) and Human Immunodeficiency Virus (HIV) infections to investigate whether they were carriers of any of the mentioned viruses. This study aimed to determine the frequency of hepatitis B surface antigen (HBsAg), antibody to hepatitis C virus (Anti HCV) and antibody to HIV virus (anti HIV) positive patients among those undergoing elective cataract surgery. The study was approved by the Research and Ethics committee of Yemen Magrabi Eye Hospital, and the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional), and with the Helsinki Declaration of 1975, as revised in 2000.

All admitted patients in the age interval 18 years and above who underwent cataract surgery were included in the current study. None of the patients was eventually excluded from the study. Demographic and clinical indices were recorded and stored in a Microsoft Excel 2007 sheet. After data management, data was later analyzed using SPSS version 20. Descriptive analysis was done, where categorical variables were presented as frequencies and percentages while continuous variables as mean (\pm SD). Chi-square test was used to detect risk factors for glaucoma and the

need for surgery (Fisher Exact test whenever indicated). Confidence interval level was set to 95% where a corresponding p value threshold was identified as 0.05 where any output p below 0.05 would be interpreted as an indicator of statistical significance.

Rapid chromatography immunoassay for qualitative detection of surface antigen of hepatitis B and antibodies for hepatitis C was the screening technique of choice in this study. Positive results in the screening test were confirmed through Enzyme-Linked Immunosorbent Assay (ELISA) method. The Advanced HBsAg test kit which is a one-step enzyme immunoassay was used in the qualitative detection of Hepatitis B surface Antigen (HBsAg) in human serum or plasma. The RecomiLISA HCV IgG Test is a solid phase enzyme and linked immunoassay was specifically used to detect IgG of HCV in human serum or plasma.

RecombiLASA HIV 1 and 2 Antibody tests are a solid phase enzyme linked and immunoabsorbent assay was used in the qualitative detection of anti-HIV-1 and anti-HIV-2 antibodies in human serum or plasma. Positive patients for HBV, HCV and HIV were referred for further medical evaluation and patients' information was kept confidential.

Results:

During the study period, a total of 1203 patients were screened including 603 (51.1%) male and 600 (49.9%) female patients that were included in the current study. The mean (\pm SD) age of the studied population was 59.96 (\pm 12.39) years, where age was further categorized into four age groups of [18–30], [31–50], [51–70] and [above 70] years (Table 1).

Table 1: Distribution of patients according to age and gender

Age group (years)	Gender					
	Male		Female		Total	
	No.	(%)	No.	(%)	No.	(%)
18-30	8	1.3	9	1.5	17	1.4
31-50	146	24.2	148	24.7	294	24.4
51-70	344	57.1	352	58.7	696	57.9
Above 70	105	17.4	91	15.1	196	16.3
Total	603	100	600	100	1203	100

Out of the recruited 1203 patients who reported for cataract surgery, 130 (10.8%) turned out to be

positive for HBV, HCV and HIV. The total prevalence of HBV and HCV in preoperative

cataract patients was found to be 81/1203 (6.7%) and 49 / 1203 (4.1%) respectively. Only one female patient was found with a co-infection with both HBsAg and Anti-HCV positive in

parallel. Likewise, one male patient was HIV positive. The most affected age group by HBV infection was the age group (51-70) years with (60.5%) (Table 2).

Table 2: Relationship between age groups and Hepatitis B Virus (HBV)

Age group (years)	HBV					
	Non-reactive		reactive		Total	
	No.	(%)	No.	(%)	No.	(%)
18-30	16	1.4	1	1.2	17	1.4
31-50	275	24.5	19	23.5	294	24.4
51-70	647	57.7	49	60.5	696	57.9
Above 70	184	16.4	12	14.8	196	16.3
Total	1122	100	81	100	1203	100

Pearson Correlation is not significant P value of (0.985) and (r= - 0.001).

The frequency of hepatitis B among age groups (18– 30), (31 – 50), (51 – 70), and > 70 years was 1.2% (1/81), 23.5% (19/81), 60.5% (49/81) and 14.8% (12/81), respectively. Meanwhile, the most affected age group by HCV infection was those aged (51-70) years (53.0%)

(Table 3). Moreover, the frequency of hepatitis C among the age groups (18– 30), (31 – 50), (51 – 70), and > 70 years was 0% (0/49), 22.5% (11/49), 53.0% (26/49) and 24.5% (12/49), respectively.

Table 3: Relationship between age groups and Hepatitis C Virus (HCV)

Age group (years)	HCV					
	Non reactive		reactive		Total	
	Count	(%)	Count	(%)	Count	(%)
18-30	17	1.5	0	0.0	17	1.4
31-50	283	24.5	11	22.5	294	24.4
51-70	670	58.1	26	53.0	696	57.9
Above 70	184	15.9	12	24.5	196	16.3
Total	1154	100	49	100	1203	100

Pearson Correlation is not significant P value of (0.167) and (r= 0.040).

Additionally, the prevalence of HBV was more common in males 56.8% (46/81) than females 43.2% (35/81) (Table 4). On the other hand, the

prevalence of HCV was more common in females with 55.1% (27/49) compared to males 44.9% (22/49) (Table 5).

Table 4: Relationship between Gender and Hepatitis B Virus (HBV)

Gender	HBV					
	Non reactive		Reactive		Total	
	Count	(%)	Count	(%)	Count	(%)
Male	557	49.6	46	56.8	603	51.1
Female	565	50.4	35	43.2	600	49.9
Total	1122	100	81	100	1203	100

Pearson Correlation is not significant P value of (0.214) and (r= - 0.036).

Table 5: Relationship between Gender and Hepatitis C Virus (HCV)

Gender	HCV					
	Non reactive		Reactive		Total	
	Count	(%)	Count	(%)	Count	(%)
Male	581	50.3	22	44.9	603	51.1
Female	573	49.7	27	55.1	600	49.9
Total	1154	100	49	100	1203	100

Pearson Correlation is not significant P value of (0.455) and ($r= 0.022$).

Discussion:

Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human Immunodeficiency virus (HIV) are global diseases that are endemic in many of the developing countries. The global burden shows around 2 billion infections with 350 million chronic HBV cases worldwide, and as anticipated, Yemen is also facing a huge burden of these diseases. Although Yemen is in a moderate HBV and HCV prevalence level, chronic HBV is still a severe public health problem with a carrier rate of 8 – 12% and HCV of about 1.7 – 2.7% [6, 11].

All of the HBV, HCV and HIV are quickly spreading in the majority of the developing world. Most of the patients suffering from HBV and HCV do not realize that they have got such deadly viruses in their body and can transmit it to non-infected healthy individuals. A large number of cases become positive for HBV, HCV and HIV but they remain asymptomatic. They are known as silent carriers [17] and may act as a source of transmission of the virus.

There is increasing evidence that the prevalence of HBsAg and anti-HCV in hospitalized surgical patients is relatively high [7]. The commonly detected risk factors for such viruses infection include; old age (above 50), gender (female), bad hygiene, less awareness, some specific occupations and exposure to surgical interventions or unclean barbers [8]. However, the re-use of contaminated syringes, surgical instruments and improperly screened blood products are of the quite crucial risk factors. [13] There is a lack of routine serological screening prior to surgery which is one of the leading factors for increased disease transmission. Therefore, doctors and paramedical staff involved in surgical practice are the at high risk group of acquiring blood borne diseases from patients on whom they operate [3, 19]. Nevertheless, such dilemma of viral hepatitis magnitude in hospitalized patients is not effectively controlled even though the

asymptomatic patients who pose a huge risk of spreading the infection to other patients and the associated medical workers.

The World Health Organization considers HBV and HCV as epidemic diseases mainly because patients living with HBV and HCV can remain in the subclinical stage, i.e.: positively infected while undetected due to the asymptomatic nature of the disease for decades before being diagnosed. The prevalence of both HBV and HCV in our population is alarming, not only for the general population but also for the associated general health care personnel [3,19].The literature shows that the prevalence is continuing to rise especially in certain regions such as some rural areas of developing countries where the percentage of infected individuals is significantly higher than those reported [10].

In our series, out of 1,203 cataract patients booked for surgery, 10.8% were positive for HBV, HCV and HIV. Thus, the total prevalence of HBV and HCV among them is 6.7% 4.1%, respectively. Besides, the prevalence of HBV infection is higher than that of the HCV in this study, which goes with the findings of India and contradicts with the findings of Pakistani group[15].

In our study, the higher frequency of HBV and HCV were in the age group of (51 – 70) years which is quite equivalent to other studies [12].This could be due to conducting the study among cataract patients, where the majority of whom is already of old age. Moreover, among 81 affected patients with HBV males 56.8% (46/81) were more common than females 43.2% (35/81) and among 49 affected patients with HCV females with 55.1% (27/49) were more common in comparison to males 44.9% (22/49). The greater frequency of HBV infection in males as compared to females could be due to more social mobility in males than females and thus greater vulnerability to be infected especially in rural areas as compared to females. This finding is comparable to the

findings of a similar study done in Pakistan [2]. Unfortunately, once infected, these infections show poor response to the available treatment modalities. Therefore, precautionary methods are considered as the best way to avoid the spreading of this disease. Unlike HCV, several vaccines have been developed for HBV that provide long lasting immunity to individuals [21]. It is the most important precautionary measure of HBV as a vaccinated individual may never contract the infection [13]. Recently, the prevalence of HBV has considerably declined in many countries since the introduction of these immunizations. A recent study in Yemen revealed that a high response rate to HBV vaccine is being recognized. However, a considerable proportion (32.4%) of vaccinated children remains to be reconsidered for either revaccination or booster doses due to the lack and inadequate or low response. The trend of decreasing antibody level with increasing age suggests a need of careful monitoring of HBV vaccine efficacy in Yemen and similar countries [18].

All infections can be further avoided by the use of disposable syringes, screened blood transfusion, avoidance of sexual abuse, antiseptic shaving and use of proper antiseptic measures in hospitals, clinics and operating theaters [4, 8]. Public awareness regarding hazards and common modes of disease transmission should be transmitted through print and electronic media and public awareness programs. Steps need to be taken to abort this preventable disease.

There were however a number of limitations in our study. This study was conducted among patients of certain eye disease (cataract surgery eligible patients) therefore; the prevalence we assessed could be over or underestimated. Another limitation of this study is due to the study design, where other risk factors such as previous surgeries, drug use and risky sexual behavior which may influence the incidence of hepatitis and HIV infections were not obtained.

Further studies are needed to address these issues.

With such higher prevalence of these viral diseases in our population, it is important that patients should be regularly screened for Hepatitis B, Hepatitis C and HIV. Media should be used as a tool to raise awareness in the public.

Conclusions:

Our findings in elective cataract surgery are very alarming. Routine screening of patients booked for surgery should be nationally applied

All patients undergoing an ophthalmic procedure should be checked for anti HCV and HBsAg and HIV. A solid policy outlining the preventive practices is needed to stop this high burden of hepatitis turning into public health disaster. There is a need for implementing a screening of Hepatitis B, Hepatitis C and HIV programs among preoperative patients. Public awareness regarding hazards and common modes of disease transmission should be raised through electronic media and nationally adopted public awareness programs.

All patients undergoing an ophthalmic procedure should be checked for anti HCV and HBsAg and HIV. A solid policy outlining the preventive practices is needed to stop this high burden of hepatitis turning into public health disaster. There is a need for implementing a screening of Hepatitis B, Hepatitis C and HIV programs among preoperative patients. Public awareness regarding hazards and common modes of disease transmission should be raised through electronic media and nationally adopted public awareness programs.

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تواتر الالتهاب الكبدي ب ، التهاب الكبد الوبائي س وفيروس نقص المناعة البشرية في المرضى الذين يخضعون لجراحة الساد

أحمد موسى عبدالرحيم

محفوظ عبدالله بامشموس

الملخص

الهدف من هذه الدراسة هو تقويم حالات التهاب فيروس ب وفيروس ج وفيروس الأيدز في المرضى الذين يخضعون لجراحة الساد (الماء الأبيض). أجريت هذه الدراسة من بين 1203 مرضى فوق سن 17 سنة الذين كان من المقرر إجراء جراحة إزالة المياه البيضاء في مستشفى مغربي للعيون في اليمن في الفترة من 1 يناير إلى 31 ديسمبر 2012م. أجري للمرضى فحوصات مخبرية لفيروس ب وفيروس ج وفيروس الأيدز وتم بعدها تحليل النتائج. إجمالي عدد المرضى الذين تم فحصهم كان 1203 مرضى منهم 603 (51.1%) ذكور و 600 (49.9%) إناث. متوسط العمر كان 59.96 + 12.39 سنة. من أصل 1203 حالة مياه بيضاء حجزت للعملية الجراحية، 130 (10.8%) حالة تبين أنها موجبة لفيروس الكبد ب وفيروس الكبد ج وفيروس الأيدز. معدل الانتشار الكلي لفيروس الكبد ب كان 81 من 1203 حالات (6.7%) وفيروس الكبد ج 49 من 1203 حالات (4.1%). تم العثور على مريض واحد مصاب بعدوى مشتركة من فيروس الكبد (ب و ج). بينما مريض واحد (0.83%) كان موجبا لفيروس الأيدز. نستنتج أن ارتفاع معدل الانتشار بنسبة 10.8% لإلتهاب فيروس الكبد ب وفيروس الكبد ج بين مرضى جراحات المياه البيضاء (الساد) لذلك نقترح أن الفحص الفيروسي قبل العملية لجميع المرضى يجب أن يكون إلزاميا كشرط أساسي لإجراء الجراحة. كما يجب اتخاذ سياسة صلبة لتحديد الممارسات الوقائية كحاجة ماسة للسيطرة على هذه الظاهرة ومنع عواقبها السلبية.

كلمات مفتاحية: التهاب الكبد B ، التهاب الكبد C ، فيروس نقص المناعة البشرية ، جراحة الساد ، الفحص