

RISK OF TRANSMISSION OF HEPATITIS-B AND C VIRUSES IN UPPER GASTROINTESTINAL ENDOSCOPY - A HOSPITAL BASED STUDY

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ABSTRACT

Background: A study was carried out at Gastroenterology department Military Hospital, Rawalpindi, from 6th June to 24th October 2002, to assess the risk of upper gastrointestinal endoscopic procedure as a route of transmission of HBV and HCV.

Methods: One hundred consecutive patients reporting for endoscopy at Gastroenterology department, MH, Rawalpindi, fulfilling the inclusion and exclusion criteria were selected. Their base-line HBV and HCV status were assessed prior to endoscopy. They were then recalled after 04 months to re-assess the HBV and HCV status.

Results: Two patients (2%) tested positive for HBsAg, and none for Anti HCV antibodies, after 04 months of the procedure. One of the HBsAg positives had a history of unchecked blood transfusion after the endoscopy.

Conclusion: Endoscopy is a very safe procedure provided strict disinfection techniques are followed. However, staff and patient education regarding preventive methods against HBV and HCV remains the cornerstone in avoiding their transmission.

Keywords: HBV, HCV, endoscopy

INTRODUCTION

Several articles [1-2] have discussed the potential for transmission of infectious organisms during gastrointestinal endoscopy. A recent review article [1] cited 281 cases of transmission of microorganisms by gastrointestinal endoscopy over the last 26 years. Two hundred and fifty three of these were reported before 1988. The total number of endoscopies performed between 1966 and 1987 is unknown but surveys for the U.S. Department of Health and Human Services have estimated that 5.4 million were performed in 1987 alone [2].

In 1988, the Society of Gastrointestinal Nurses and Associates (SGNA) [3], the American Society of Gastrointestinal

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Endoscopy (ASGE) [4] and the British Society of Gastroenterology (BSG) [5] published guidelines for endoscope cleaning and disinfection. Since then, 28 cases of infection related to endoscopy have been reported. From 1988 to 1992 approximately 40 million gastrointestinal endoscopies were done. Therefore, the estimated incidence of reported transmission of infectious organisms by endoscopy is approximately 1 in 1.8 million.

Recent concerns regarding cleaning and disinfecting procedures of gastrointestinal endoscopes have focused on the potential transmission of human immunodeficiency virus (HIV) and hepatitis B virus (HBV). However the Center for Disease Control has stated that currently recommended procedures for disinfection of endoscopes are adequate for instruments contaminated with these viruses [6]. Since 1988, no cases of

transmission of HIV or HBV have been reported.

Purpose of the Study

This study was designed to evaluate Hepatitis B and Hepatitis C status pre and post endoscopies at gastroenterology department, Military Hospital, Rawalpindi.

MATERIALS AND METHOD

This was an observational prospective study carried out at out-patient gastroenterology department of MH Rawalpindi, from 6th June 2002 to 24th October 2002. One hundred consecutive adult patients (18 years and above) undergoing endoscopies for suspected acid peptic disease, with negative pre-procedure HBsAg and anti HCV antibody status were included. There was no age or sex discrimination.

Inclusion Criteria

- Age above 18 years.
- Suspected acid peptic disease

Exclusion Criteria

- Age more than 70 years.
- Known history of chronic liver disease or cirrhosis.
- Other debilitating diseases like congestive heart failure, chronic renal failure and diabetes mellitus. (more prone to increased needle pricks)
- Health care workers. (more prone to needle pricks)
- Known positive Hepatitis B or C status.

Besides other base-line investigations, their blood was screened for HBsAg by Elisa method (3rd. Generation) and anti-HCV Antibodies by Elisa method (4th Generation) before undergoing endoscopic procedures. They were then recalled after 04 months for reassessment of their Hepatitis B and C status. In the final analysis, one hundred patients completing the study have been included.

STATISTICAL ANALYSIS

Data collected has been analyzed using SPSS V.10. Chi square test was applied to check the significance and p value < 0.05 was taken as significant.

RESULTS

In the study, only 2 (2%) patients tested positive for HBV after 4 months of undergoing the procedure (table-1). None tested positive for HCV after the same duration (table-2).

The average ages were 37 years for males and 41 years for females.

DISCUSSION

Of the hundred subjects followed for four months, only two tested positive for hepatitis B. None, however, was positive for hepatitis C. One of the two positive cases was an elderly gentleman, who was diagnosed as having Iron deficiency anemia and given a blood transfusion, two months after the endoscopy. There was no apparent risk factor in the second positive case.

Factors important in the transmission of microorganisms during gastrointestinal endoscopy include the concentration and type of microorganism, the efficacy and compliance with cleaning and disinfection procedures, and equipment design.

Organisms that have been reported to be transmitted include E. coli [7], Pseudomonas [8], Hepatitis B, Klebsiella [9], Serratia and Salmonella [10].

Most episodes of infection can be traced to procedural errors in cleaning and disinfecting the endoscope or its accessories. Bacteria or viruses have been transmitted by inadequately cleaned endoscopes in which organisms may be concentrated in joints and crevices, contaminated water bottles and irrigating solutions, improper use of or inadequately designed automatic endoscope washing machines, use of substandard disinfectant solutions, and inadequate drying of the endoscope channels prior to overnight storage.

Nine publications have cited endoscopic transmission of Salmonella in 84 patients. Seven used suboptimal disinfectants such as hexachlorophene, cetrimide, chlorhexidine or a quaternary ammonium compound [10-15]. One concluded that there was a "lack of scrupulous cleaning of equipment prior to soaking" and another 131 lacked specific documentation for establishing the endoscope as the source of salmonella transmission [1]. All of the Salmonella infections occurred prior to 1988. Use of the recommended disinfectant solution, 2% activated alkaline glutaraldehyde, with thorough mechanical cleaning, should have prevented all of these cases.

Transmission of Pseudomonas has been related to the use of an inadequate disinfectant (benzalkonium bromide and alcohol), the lack of application of current cleaning and disinfection procedures, or the use of tap water during the cleaning process [16-20]. One series eliminated pseudomonas infection by soaking endoscopes for 10 minutes in 2% glutaraldehyde [21]. Sterile or filtered water should be used in the water bottle feeding, the endoscope and this water bottle should be cleaned and dried between uses [11,18]. Forty five cases of endoscopic transmission of Pseudomonas have been reported [22,23]. Endoscopic transmission of Hepatitis B has been reported in only one patient [9]. In this case there was no flushing of the endoscope air/water channel with glutaraldehyde [24]. Several prospective studies of infected patients have failed to demonstrate hepatitis B transmission during gastrointestinal endoscopy [3].

Several endoscopy units have noted occasional transmission of Staphylococcus [7], enterobacter [17], fungus [21,25], Helicobacter pylori [26] and Compylobacter jejuni [27]. However, in each instance disinfection, mechanical cleaning, or storage techniques were inadequate. HBV, HIV and Herpes simplex are very sensitive to disinfectants [1], whereas Pseudomonas, Salmonella, Candida. Cryptococcus, Polio virus and Rhinovirus are

less sensitive. Greater resistance to glutaraldehyde is found with Mycobacterium tuberculosis and Atypical mycobacteria but exposure of these organisms to 2% alkaline glutaraldehyde for 20 to 30 minutes is sufficient to kill them [4,5]. Although bacterial spores are the most resistant to glutaraldehyde, there have been no well documented cases of endoscopic transmission

Table-1: Hepatitis-B status.

	Before Endoscopy	After Endoscopy
Negative	100	98
Positive	0	2
Total	100	100

Table-2: Hepatitis-C status.

	Before Endoscopy	After Endoscopy
Negative	100	100
Positive	0	0
Total	100	100

This variable is constant. Chi square test cannot be performed.

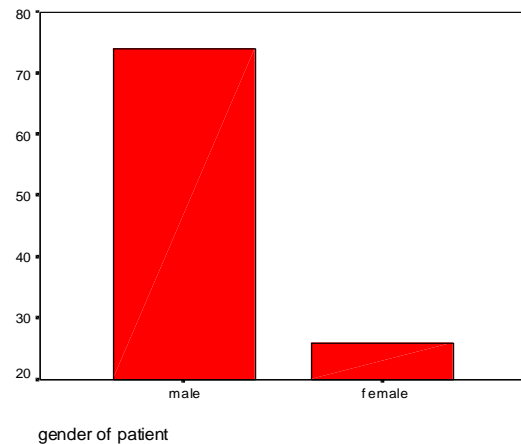


Fig: Gender distribution.

of these infections [24,28].

In a Karachi based study, two hundred normal individuals were screened for Hepatitis B surface antigen HBsAg. Results showed that 3% normal were positive for HBV [29]. In a study at Lahore, results showed 25% (531/2074) prevalence of hepatitis B virus in patients [30]. In an Abbottabad study, out of 960 donors, 18 (1.55%) were hepatitis B surface antigen

positive [31]. In Islamabad, in the screening program 12.5% were anti-HCV positive, 3.6% were HBsAg positive, 1.1% were positive for both tests [32].

Several factors are important: proper mechanical cleaning, use of an effective chemical disinfectant, proper drying and storage technique [33,34] and training and compliance of health care personnel performing these techniques.

CONCLUSION

Although endoscopes have potential sites for microorganism accumulation, relatively few infections have been reported. Since 1988, the reported rate of transmitted infection is 1 in 1.8 million procedures and the majority can be attributed to improper cleaning, un-checked transfusions or some yet un-known vector of transmission. Adherence to current guidelines for the cleaning and disinfection of endoscopes and their accessories is essential. It is the responsibility of each endoscopy unit and endoscopist to continually and thoroughly implement all aspects of recommended guidelines. However, patient education regarding preventive methods against HBV and HCV remains the cornerstone in avoiding their transmission.

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