

Is Pre-Endoscopy Hepatitis B and C Testing Useful?

Endoskopi Öncesi Hepatit B ve Hepatit C Testi Gerekli mi ?

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Objective: We determined the seroprevalence of HBV and HCV before endoscopic procedures and assessed transmission of hepatitis B and C viruses during endoscopic procedures.

Materials and Methods: In total, 2690 consecutive participants who underwent upper gastrointestinal endoscopy under the Early Diagnosis of Gastric Cancer Pilot Project were enrolled in this study. Their medical records, demographic properties, and endoscopic diagnoses were reviewed. HBsAg and anti-HCV serology of all participants was examined before endoscopic procedures.

Results: The seroprevalence of HBS(+) was 2.7% and of HCV(+) was 0.2%. The prevalence of HBV infection indicated intermediate endemicity. HCV(+) rates were higher in participants who had undergone endoscopy previously ($p = 0.020$).

Conclusion: Pre-endoscopy determination of hepatitis serology of patients is beneficial to avoid transmission of hepatitis B and C viruses

Key Words: *Hepatitis B; Hepatitis C; Transmission; Endoscopy*

Amaç: Endoskopik işlemler öncesi HBV ve HCV seroprevelansını belirlemek ve endoskopik işlemler sırasında HepatitB ve HepatitC transmisyonunu değerlendirmek.

Materyal ve Metod: Mide Kanserinde Erken Tanı Pilot Projesi kapsamında üst gastrointestinal endoskopi uylanan toplam 2690 katılımcı bu çalışmaya alındı. Katılımcıların tıbbi kayıtları, demografik özellikleri ve endoskopik tanıları gözden geçirildi. Endoskopik işlem öncesi tüm katılımcıların HBsAg ve anti-HCV serolojileri çalışıldı.

Bulgular: HBS(+) seroprevelansı %2.7,HCV(+) seroprevelansı %0.2 olarak bulundu. HBV enfeksiyon prevelansı orta endemisitede bulundu. HCV(+) oranı daha önce endoskopik uygulanalarda daha yüksek bulundu ($p = 0.020$).

Sonuç: Endoskopi öncesi hastaların hepatit serolojilerinin belirlenmesi hepatit B ve Hepatit C virus bulaşmasından kaçınmak için faydalıdır.

Anahtar Sözcükler: *Hepatit B; Hepatit C; Transmisyon; Endoskopi*

Hepatitis B (HBV) and C (HCV) virus infections are among the most common viral infections globally and are serious public health problems(1). Approximately 350 million people are infected with HBV worldwide, and the World Health Organization (WHO) estimates that approximately 170 million people are infected with HCV(2) . The global prevalence of HBV infection varies widely; its endemicity ranges from high (>8%) to intermediate (2-7%) and low (<2%)(3) . The prevalence of HBV infection has been reported to differ in various parts of the developed and developing world(4,5). Turkey has

intermediate endemicity for HBV(6) . Individuals who are unaware of their infection status may play an important role in the transmission of the disease.

Flexible endoscopy devices are considered to be a potential risk for transmission of hepatitis among patients(7). Endoscopy-related infection may occur under the following circumstances: microorganisms may be spread from patient to patient by contaminated equipment (exogenous infections), microorganisms may spread from the GI tract through the bloodstream during an endoscopy to susceptible organs or prostheses, or

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may spread to adjacent tissues that are breached as a result of the endoscopic procedure (endogenous infections), or be transmitted from patients to endoscopy personnel and/or from endoscopy personnel to patients. Especially when endoscopes are not washed adequately following a therapeutic process, hepatitis factors can be detected in endoscope channels; however, this risk is minimized by thorough cleaning(8,9). Even though automatic or manual washing alone is effective for disinfection of the device, it is suggested that biofilm layers in endoscope channels cannot be entirely eliminated by routine washing processes with detergent(10-12). Thus, it is recommended that the channels also be re-brushed manually after automatic washing(13).

Due to the risk of transmission of hepatitis in the many dialysis centers around the world, dialysis machines used by patients with hepatitis, and even their rooms, are separated from other patients(14,15). However, no such separation of endoscopy devices, which are in direct contact with patient blood and secretions, is undertaken, even though such equipment may, in fact, have a higher risk of transmission than dialysis machines. Additionally, examining the hepatitis serology of patients prior to endoscopy is not included in routine practice.

In this study, we evaluated the requirement for determining the hepatitis serology of all patients prior to endoscopy and separating patients with hepatitis from others to minimize the risk of transmission.

Materials And Methods

We reviewed the medical records of 2690 participants who underwent upper gastrointestinal endoscopy performed under the Early Diagnosis of Gastric Cancer Pilot Project at Ankara University Faculty of Medicine General Surgery, Surgical Oncology Section between January 2008 and December 2008. Their demographic properties and endoscopic diagnoses were recorded. Endoscopic procedures were performed using a single-type Fujinon VP 4400 processor, and three Fujinon EG-450 WR5 endoscopes. The contaminated devices were washed after each use for 20 min with an automatic washing device of the brand "Choyang," series CYW 100. HBsAg and anti-HCV serology of all patients was examined using a second-generation enzyme-linked immunosorbent assay (ELISA) and patients with positive serology were separated from the others. Those patients who had previously been aware of their hepatitis status and those newly diagnosed were enrolled separately. Statistical analyses were carried out using the SPSS software (ver. 10.0) and a chi-squared test. ANOVA was used for analyzing multiple groups. A *p* value of < 0.05 was considered to indicate statistical significance.

Results

Retrospectively, 2690 subjects, with an average age of 48±26 years (males: 47±84 years, females 49±67 years) were tested for hepatitis B and C markers from January 2008 to December 2008. The seroprevalences

of HBS(+) and HCV(+) were 2.7 and 0.2%, respectively (Table 1). HCV(+) rates were higher in participants who had previously undergone endoscopy (Table 2).

Discussion

Despite the large number and variety of GI endoscopic procedures performed, documented instances of infectious complications remain rare. Endoscopes are known to be a risk for the transmission of hepatitis and other microorganisms from patient to patient, albeit a low risk (16). Because the hepatitis virus may be present in saliva and gastric fluid, this risk begins during the first insertion of the endoscope into the patient's mouth and increases in cases of bleeding(8,11). The potential for transmission of infection during a GI endoscopy is a matter of concern to both physicians and patients.

Patients who undergo endoscopy, whether for diagnosis and/or treatment purposes, may be at risk not only from the endoscope itself, but also from the materials in the endoscopy unit. Acute hepatitis C cases have been reported from the reuse of materials having a risk of transmission due to insufficient disinfection, leading to horizontal transmission of the infection(17). Thus, the room where endoscopy is performed and other materials in the room are as important as the endoscope itself with respect to transmission of infection.

In a study by Shin *et al.* in Korea, among all carriers, the proportion of patients

Table 1. Seroprevalence of HBV and HCV before endoscopic procedures.

| | + | - | Carrier | Total |
|---------------|----------|-------------|----------|-------------|
| HBS number(%) | 69(%2,7) | 2470(%96,7) | 15(%0,6) | 2554(%94,9) |
| HCV number(%) | 5(%0,2) | 2557(%95) | | 2562(%95,2) |

Table 2. Relationship between HBV and HCV serology and participants who endoscopic procedures performed previously

| | | HBV(-) | HBV(+) | P value | HCV(-) | HCV(+) | P value |
|----------------------|--------------|-------------|----------|---------|-------------|---------|---------|
| Previously endoscopy | Notperformed | 1809(%96,6) | 63(%3,4) | 0,720 | 1878(%99,9) | 1(%0,1) | 0,020 |
| | Performed | 661(%96,9) | 21(%3,1) | | 679(%99,4) | 4(%0,6) | |

who were unaware of their disease, despite being a hepatitis carrier, was 30%(18). In the study by Gulsen *et al.* in Turkey, 78.94% of patients were unaware of their disease; of these, 78.57% had HBV and 80% HCV (19). Performing endoscopy without hepatitis screening for such patients, up to 80% of whom are unaware of having hepatitis, suggests that the physicians themselves may play a major role in transmission. Thus, examination of hepatitis markers in each patient prior to endoscopic

procedures would seem to be reasonable.

It is known that HBV transmits 10 times faster than HCV (19). In our study, the HCV(+) ratio was higher in patients who had previously undergone endoscopy. This supports the idea that re-use of materials represented a risk of transmission of HCV because insufficient disinfection may have resulted in horizontal transmission of the infection.

As a result, although infection control committees carry out routine inspections

of endoscopy units, considering the difficulties in endoscope disinfection, we believe that it would be beneficial to routinely determine the hepatitis serology of patients prior to endoscopy. Additionally, there is a need for further studies evaluating the cost-effectiveness of using separate endoscopy devices allocated to groups of patients with HBV, HCV or to those who do not carry hepatitis.

Conflict of interest: Nothing to declare.

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