EVALUATION OF METABOLIC PANEL AND HEPATITIS MARKERS OF TYPE 2 DIABETES MELLITUS PATIENTS

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ABSTRACT

Purpose: Our aim is to evaluate the hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (AntiHBs) and AntiHCV negativity and positivity rates which can be investigated in the primary care in Type 2 Diabetes Mellitus (DM) patients in this study.

Material and method: The recordings of patients who were diagnosed with type 2 diabetes and whose hepatitis serology was recorded in Eskişehir Tepebaşı District Yeni Family Health Center’s information management system program between the dates of 01.01.2016 - 31.12.2016 were evaluated retrospectively. Age, gender, comorbid diseases of patients were noted. Hepatitis serology and routine blood test results in the last 3 months were taken from the database. SPSS 21 program was used for statistical analyze.

Results: A total of 300 patients were reached. 182 (60.7%) of the patients were female and 118 (39.3%) were male. The mean age of the patients was 58.66 ± 11.44 years. When the patients were questioned regarding treatment method of diabetes, it was found out that 205 patients (68.3%) received only oral antidiabetic (OAD), 54 patients (18.0%) received insulin with OAD, and 41 patients (13.7%) received only insulin therapy. Of the 300 patients in the study group, 16 (5.3%) were hepatitis B surface antigen (HBsAg) positive, 62 (20.7%) were hepatitis B surface antibody (AntiHBs) positive and 7 (2.3%) were AntiHCV positive.

Conclusion: Vaccination rates of patients can be increased by spending more time on counseling about vaccination and by emphasizing possible problems they may face if not vaccinated.

Keywords: Type 2 DM, Hepatitis B, Hepatitis C.

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Introduction

Diabetes Mellitus (DM) is a chronic, metabolic disease presenting with hyperglycemia and affecting a significant rate of the world’s population. Its prevalence is growing by 20% in developed countries and 69% in developing countries. It is estimated that 439 million people in the adult age group will be DM patients by 2030. Diabetes prevalence was identified as 16.5% (7.5% were newly diagnosed) in an epidemiological study conducted in Turkey in 2013. This shows that there are approximately 6.5 million adult diabetes patients in Turkey.

Risk factors for diabetes include obesity, advanced age, gender, smoking, sedentary lifestyle, hepatitis C virus (HCV) genotype type 3, severe liver fibrosis, diabetes story in family and liver/kidney transplantation. HCV infection causes disorders like hepatic cirrhosis, portal hypertension, and hepatocellular carcinoma. Hyperinsulinemia and insulin resistance caused by hepatosteatosis and cirrhotic liver are thought to increase the predisposition to type 2 diabetes mellitus.

Acute hepatitis B infection is seen more commonly in diabetic patients compared to healthy population. Therefore, chronic hepatitis B infection risk is increased. This can be prevented with hepti-
tis B vaccination. Hospitalization due to acute and chronic hepatitis B infection in adult diabetic patients is increasing and because of that medical expenses are growing. In several studies, it is shown that medical expenses are decreased with hepatitis B vaccination in this age group\(^7\).

ADA (American Diabetes Association) and ACIP (The Advisory Committee on Immunization Practices) suggest hepatitis B vaccination in diabetic patients within proper age group which hasn’t vaccinated for hepatitis B and haven’t encountered with the virus\(^8\).

Our aim is to evaluate the negativity and positivity rates of HBsAg, AntiHBs, and AntiHCV which can be studied in primary care in Type 2 Diabetes Mellitus patients.

Material and method

This study was conducted on the recordings of patients aged 18 years and above who were diagnosed with type 2 diabetes and whose hepatitis serology was recorded in Eskisehir Tepebaşı District Yeni Family Health Center’s information management system program between the dates of 01.01.2016 - 31.12.2016 were evaluated retrospectively. Approval from ethical committee was received from Eskişehir Osmangazi University (ESOGU) Medical Faculty Clinical Research's Ethical Committee’s 13.02.2017 dated 18 numbered approval and Eskişehir Public Health Directorate’s 15.03.2017 dated 69957824-133.01.03 numbered approval. Age, gender, comorbid diseases of patients were noted. Hepatitis serology and routine blood test results in the last 3 months were taken from the database retrospectively.

Treatment methods received by type 2 DM patients were recorded. Treatment methods were categorized into 3 groups which are oral antidiabetic (OAD) receivers, OAD + insulin receivers, and insulin receivers. Patients were not examined for any additional laboratory tests other than routine checks. Laboratory tests examined in routine controls were recorded which are fasting blood glucose (FBG), glycosylated hemoglobin (HbA1c), alanine aminotransferase (ALT), aspartate aminotransferase (AST), hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (AntiHBs), AntiHCV, low-density lipoprotein (LDL), Triglyceride (TG) and high-density lipoprotein (HDL).

Statistical analysis

SPSS 21 Package program was used for statistical analyze. The descriptive statistics for continuous variables are given as mean ± standard deviation, median (Q1-Q3). Categorical variables are shown as frequency and percentage.

Findings: A total of 300 patients were reached. 182 (60.7%) of the patients were female and 118 (39.3%) were male. The mean age of the patients was 58.66 ± 11.44 years. When the patients were questioned regarding diabetes treatment, 205 patients (68.3%) were receiving only OAD, 54 patients (18.0%) were receiving insulin and OAD together, and 41 patients (13.7%) were receiving only insulin therapy.

When the patients were questioned for additional chronic diseases other than diabetes, at least one additional chronic disease was found in 229 patients (76.3%). Hypertension was encountered the most (in 160 patients, 53.3% of all patients). There was no chronic disease other than diabetes in 71 patients (23.7%). Details are shown in Table 1.

<table>
<thead>
<tr>
<th>Additional Chronic Diseases</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>160</td>
<td>53.3</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Rheumatological Diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>Gout Disease</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Mental Disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>Mood Disorder</td>
<td>41</td>
<td>13.7</td>
</tr>
<tr>
<td>Psychosis</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Chronic Pulmonary Diseases</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Hypothyroidism</td>
<td>44</td>
<td>14.7</td>
</tr>
<tr>
<td>Gastro Esophageal Reflux</td>
<td>74</td>
<td>24.7</td>
</tr>
<tr>
<td>Cancer</td>
<td>13</td>
<td>4.3</td>
</tr>
<tr>
<td>Parkinson</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>18</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 1: Distribution of Additional Chronic Diseases of Patients in the Research Group.

Laboratory findings of patients are shown in Table 2.

Of the 300 patients, 16 (5.3%) were HbsAg positive, 62 (20.7%) were AntiHBs positive and 7 (2.3%) were AntiHCV positive.
Discussion

Diabetes is a systemic disease in which complex mechanisms such as insulin release problems and increased glucose activity are involved and multiple factors (obesity, age, sedentary lifestyle and genetic factors) are blamed. Metabolic panel and hepatitis markers of Type 2 DM patients were evaluated retrospectively in our study and increasing the awareness of family physicians who is working in the primary care were aimed, for especially HBV vaccination in this group of patients.

When additional chronic diseases other than diabetes are questioned, it is seen that hypertension was encountered the most. Similar studies in the literature also show that a significant amount of diabetes patients are accompanied by atherosclerosis and hypertension.

Glucose intolerance and insulin resistance are important in chronic HCV patients. However, the effect of HCV on increasing predisposition to diabetes mellitus is unclear. HCV infection worsens hepatosteatosis and increases cytokines which are involved in developing of type 2 diabetes mellitus by causing insulin resistance.

Our country is one of the countries with a HCV prevalence of 1-1.9% in the world. AntiHCV positivity rate in type 2 DM patients was 2.3% in our study. There was no significant difference compared to normal population.

Strips used for blood glucose testing increase the contamination risk for HBV. Therefore, HBV epidemics can be seen due to the shared use of blood glucose meters in diabetic patients without being cleaned and disinfected.

Hepatitis B is responsible for morbidity and mortality by causing acute and chronic liver infections. HBV vaccination is recommended in diabetic patients.

ADA (American Diabetes Association) suggests HBV vaccination to all unvaccinated diabetic patients.

Hepatitis B vaccination in diabetes mellitus patients is an important factor in terms of hospitalization, mortality, morbidity and medical expenses in this group of patients.

In Turkey, vaccination rates in the general population and in diabetic patients are lower than developed countries.

Arslan et al. found Hepatitis B vaccination rate to be 15.5% in their study. Similarly, AntiHbs positivity rate was found as 20.7% in our study.

It was observed that 61% of the patients had visited a physician a couple of times in the last year according to the study conducted in United States of America when investigating low rates of vaccination. It was also determined that physicians couldn’t properly advise on the importance of vaccination to the patients despite having knowledge about vaccination in diabetic patients.

The fact that physicians mainly focus on the treatment of diabetes and additional diseases on many patients, may have caused vaccination to be neglected. Patient awareness and increased vaccination rates can be provided by being more conscious and consistent on this issue.

Vaccination rates can be risen by spending more time on patient advising, underlining preventive outcomes of vaccines and potential issues they may face if not vaccinated. Organizing vaccination campaigns, reducing the cost for the patients with indications, providing vaccines practicable in the clinic setting, or the improvement of the prescription tracking system may contribute to increasing the vaccination rates in patients.

Table 2: Distribution of Laboratory Findings of Patients in the Research Group.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Frequency</th>
<th>Min-Max (Q1-Q3)</th>
<th>Mean ± S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBG (mg/dl)</td>
<td>300</td>
<td>72-437</td>
<td>156.53 ± 64.91</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>298</td>
<td>4.04-14.30</td>
<td>7.47 ± 1.69</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>275</td>
<td>45-400</td>
<td>130.29 ± 48.41</td>
</tr>
<tr>
<td>TG (mg/dl)</td>
<td>285</td>
<td>50-809</td>
<td>183.20 ± 113.82</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>280</td>
<td>19-106</td>
<td>47.13 ± 11.96</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>293</td>
<td>6-268</td>
<td>26.42 ± 26.58</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>278</td>
<td>7-516</td>
<td>27.70 ± 39.00</td>
</tr>
</tbody>
</table>

References

3) Meisinger C, Thorand B, Schneider A, Stieber J, Döring A, Löwel H. Sex differences in risk factors for incident type 2 diabetes mellitus: the MONICA


