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Quality of diabetes care in family medicine practices in eastern Bosnia and Herzegovina

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ABSTRACT

Objectives: In the present study, the audit of medical files of patients with diabetes, followed in family medicine practices in the eastern region of Bosnia and Herzegovina (BiH), was carried out in order to investigate the frequency of the use of screening tests for early diagnosis of diabetes complications.
Methods: The audit was conducted in 32 family medicine practices from 12 primary health care centers in the eastern part of BiH over one-year period (March 2010 to March 2011). A specially established audit team randomly selected medical files of 20 patients with diabetes from the Diabetes Registry administered by each family medicine team database. Screening tests assessed are selected according to the ADA guidelines.
Results: Frequency of the individual screening test varied between 99%, found for at least one blood pressure measurement, and 3.8% for ABI measurement. When the frequency of optimal use of screening was analyzed, only 1% of patients received all recommended screening tests.
Conclusion: The frequency of the use of screening tests for chronic diabetes complications was found to be low in the eastern part of Bosnia and Herzegovina. Multivariate linear regression analysis showed that longer duration of diabetes and a larger number of diabetics per practice were associated with a smaller number of screening tests, but specialists in family medicine provided a higher number of screening tests compared to other physicians.
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1. Introduction

Diabetes mellitus is a common chronic illness, which is associated with many chronic complications. Diabetes was found to be the leading cause of renal failure, the second commonest cause of lower limb amputation, and the leading cause of blindness in working age group [1,2]. Screening practices to detect the early stage of chronic complications of diabetes effective and recommended by evidence based guidelines [3–9].

The American Diabetes Association (ADA) recommends that all persons with diabetes should receive the set of screening tests in an effort of early detection of chronic complication and of reducing their impact on disease outcome.

For nephropathy screening, an annual testing of urine albumin excretion and serum creatinine measurement are recommended. Screening for microalbuminuria by measuring

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the albumin-to-creatinine ratio in a random spot urine collection was found to have sufficient accuracy and predictability and is more convenient than 24-h or timed urine collections [10–12].

Retinopathy screening should include an initial dilated and comprehensive eye examination by an ophthalmologist shortly after the diagnosis of diabetes and subsequent annual examinations. Less frequent exams (every 2–3 years) may be cost effective in patients with well-controlled type 2 diabetes and those with one or more normal eye examinations. Examinations will be required more frequently if retinopathy is progressing [13,14].

Diabetic peripheral neuropathy (DPN) should be screened annually using tests such as pinprick sensation, vibration perception 10-g monofilament pressure sensation at the distal plantar aspect of both big toes and metatarsal joints, and assessment of ankle reflexes. Combinations of more than one test have >87% sensitivity in detecting DPN. Loss of 10-g monofilament perception and reduced vibration perception predict foot ulcers. The symptoms and signs of autonomic dysfunction should be elicited carefully during the history and physical examination [15–18].

Initial screening for peripheral artery disease (PAD) should include a history for claudication, foot examination and an assessment of the pedal pulses. A diagnostic of ankle-brachial index (ABI) should be performed in any patient with symptoms of PAD. Due to the high prevalence of PAD in patients with diabetes and its asymptomatic course ADA consensus statement suggested screening of ABI in patients over 50 years of age and in younger ones who have other PAD risk factors (smoking, hypertension, hyperlipidemia, or duration of diabetes >10 years) [7,8,19].

Although the recommendations of the guidelines are based on clinical evidence and accepted by the medical community, it has been reported that few patients obtained all recommended screening tests [4,20]. In the present study, the audits of medical files of patients with diabetes, followed in family medicine practices in the eastern region of the Republic of Srpska, Bosnia and Herzegovina, was carried out in order to investigate the frequency of the use of screening tests for early diagnosis of diabetes complications.

2. Methods

The audit was conducted in 32 family medicine practices from 12 primary health care centers in the eastern part of the Republic of Srpska, BiH. The sample size for the audit population of 6032 patients with diabetes included in regional Diabetes Registry, with the confidence interval of 3.7% and confidence level of 95% was calculated to be 629.

An especially established audit team randomly selected medical files of 20 patients with diabetes from the Diabetes Registry administered by each family medicine team database. Patients were registered as patients with diabetes mellitus if they had two fasting plasma glucose levels above 7.8 mmol/l or two random plasma glucose levels above 11.1 mmol/l. and/or were treated with insulin and/or oral hypoglycemic agents. Patients with an established cardiovascular disease and renal failure were excluded from the audit.

In the analytical database, patient records were pseudonymised so individuals cannot be identified and access to the database was controlled by the Committee for Science and Research of Medical Faculty Foča, University of East Sarajevo. The study was approved by the Ethics Committee of the Medical Faculty Foča.

In addition to the data on the patient characteristics (age, gender, years of diabetes, type of diabetes, type of treatment and level of education), and their average serum levels of glucose, Hb1Ac, total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides, the physician characteristics (gender, age, years of practice, specialty) and their practice characteristics (number of registered patients, number of patients with diabetes, environment of practice) were registered. Screening tests assessed were selected according to the ADA guidelines 2010 [7] and included: blood pressure, body mass index (BMI), urine protein analysis, serum creatinine, dilated eye examination, foot examination, screening for distal symmetric polyneuropathy (DPN) and ankle-brachial index (ABI).

According to ADA recommendations [7,8], A1C <7%, BP <140/80 mmHg (previously BP < 130/80 mmHg), total cholesterol level <4 mmol/l, HDL > 1.0 mmol/l in men and 1.3 mmol/l in women, LDL < 2.6 mmol/l, triglycerides <1.7 mmol/l and BMI $\leq$25 kg/m^2 were defined as target values.

To evaluate the barriers to high-quality diabetes care, the Delphi technique with three iterative questionnaires was used. Thirty-two physicians and 62 nurses were asked to fill the first questionnaire on barriers to achieving better quality of diabetes care and to the implementation of the recommended screening tests for chronic diabetes complications in their practice. The answers to the first questionnaire were summarized and analyzed individually and the second, more structured questionnaire was designed. In the second questionnaire, the study participants were asked to rank the importance of each response from the previous survey by using Likert scale. In the third questionnaire, the participants were asked to express their agreement or disagreement with the group assessment and to provide their comments. During all three phases, the participants were individually informed about the objectives and principles of Delphi technique.

2.1. *Statistical analysis*

The analysis considered screening from two perspectives: the use of individual screening and screening practices at the optimal level. According to the ADA guidelines, patients who received all eight screening tests in the last year were considered as patients obtaining appropriate and optimal screening.

Data are expressed as mean values and standard deviations or as frequencies. Frequencies of the use of individual screening tests and screening practice at the optimal level are presented. Variables were compared among the groups by a two-way analysis of variance (ANOVA), *t*-tests, Tukey's multiple comparisons test, Wilcoxon test, Kolmogorov–Smirnov test and a chi-square test, as appropriate. The association between the frequency of screening test and the patient, the physician and practice characteristics was analyzed by using ANOVA and a multivariate linear regression analysis in addition. The variables that were included in the model were as follows: patient age, gender, education and type, duration,

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