

## ORIGINAL PAPER

# Auditing of Medical Chart Among Type 2 Diabetic Patient Done by Primary Care Physicians

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**Aim:** To analyse the difference in documentation of standard parameters for monitoring DM type 2 between Family Medicine Teams (FMT) and Teams on Program Additional Training (PAT). **Methods:** Study was conducted as 20 medical chart audits of diabetic type 2 patients randomly selected per 3 FMT from Zenica and 3 PAT from Kakanj. According to the chart, we assess sex, age, glucose in blood-GB, blood pressure-BP, total cholesterol-TC, body mass index-BMI, HbA1c, foot exam, eye exam and urinoanalysis and have any of the tests been done in the past year. **Results:** 60 medical chart from FMT and 60 medical charts from PAT teams were reviewed. FMT vs. PAT teams recorded: BG 58% vs. 30% ( $X^2=8.651$ ,  $p=0.003$ ); BP 70% vs. 33% ( $X^2=14.716$ ,  $p=0.0001$ ); TC 35% vs. 22% ( $X^2=2.011$ ,  $p=0.156$ ); BMI 48% vs. 28% ( $X^2=4.266$ ,  $p=0.038$ ); HbA1c 41% vs. 75% ( $X^2=12.377$ ,  $p=0.0004$ ); foot exam 26% vs. 78% ( $X^2=28.158$ ,  $p<0.0001$ ); eye exam 48% vs. 65% ( $X^2=2.749$ ,  $p=0.097$ ) and urinoanalysis 38% vs. 88% ( $X^2=30.179$ ,  $p<0.0001$ ). **Conclusion:** FMT recorded a higher number of metabolic parameters for macrovascular risk factors (BG, BP and BMI) than microvascular risk factors (HbA1c, foot exam and urinoanalysis) which are were better controlling by PAT teams. **Key words:** audit, type 2 diabetic patients, Primary Care.

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## 1. INTRODUCTION

Clinical Audit is the process of quality improvement of patients care whom results of a systematic review compared with specific criteria and were changes in every day practice can be implemented (1). In fact, reviewing the quality of care professionals compare their practice with the standards, change it and take a clinical practice guidelines as an endpoint for quality (2, 3).

According to the recommendations of the European and American Dia-

betic Associations components of the first "Follow up visit" to the diabetic metabolic control and evaluation of risk factors need to include check up: fasting plasma glucose, HbA1c, fasting lipid profile, microalbuminuria, serum creatinine, creatinine clearance calculation, an electrocardiogram, an exam of the foot: monofilament or vibration of the great toe, body mass index (BMI), blood pressure, and thyroid-stimulating hormone in all patients with type 1 diabetes and in patients with type 2 diabe-

tes, this hormone should be done only if clinically indicated (2, 3, 4, 5, 6, 7, 8).

Physicians need to be actively involve in prevention and control of disease and on this way can be reduces their involvement in the treatment of complications (9, 10, 11). Long-term social and economic benefits that are achieved good control of glucose levels and improve quality of care should stimulate the (Primary Health Care-PHC) physicians to work daily on clinical practice guidelines (12). Studies that included medical reports, audit practices and review of administrative data show that the quality control of DM provided by the PHC physicians is suboptimal (8, 13, 14, 15).

Bosnia and Herzegovina still does not have a national program for chronic diseases such as DM. Actually, Agency for Quality and Accreditation Health care in the Federation of Bosnia and Herzegovina (AKAZ FB&H) published accreditation standards for Family Medicine Teams/FMT—that is expected of team members to "treat patients with chronic illnesses in accordance with modern knowledge and guidelines for clinical practice (16, 17, 18).

Up to 2011. in B&H worked 621 Family Medicine specialists (FMS): in Federation 386 FMS and in Republic of Srpska (RS) 235 FMS which are not able

to respond to the demands of primary health care. However, bough Entity Ministry of Health in 2002 started with a faster way of education and training for physicians working in PHC, called Program of additional training (PAT). According to the information, Queen's University office in Sarajevo who performed the PAT training in B&H, up to 2010. education program completed 661 doctors and 1444 medical nurses in the Federation, and 358 doctors and 782 nurses in the RS, which means that in these eight generations of educated and successfully passed the exam 1019 doctors and 2226 nurses.

The aim of this audit was to analyse the difference in documentation of standard parameters for monitoring DM type 2 between Family Medicine Teams (FMT) and General Practice Teams (GPT) on Program Additional Training (PAT).

## 2. MATERIALS AND METHODS

This study was done as the audit examination which was performed at 20 randomly selected medical charts of diabetic type 2 patients at 3 FMT from Zenica and 3 PAT teams from Kakanj.

According to informations from patients records diabetics type 2 patients were analyzed by age, gender and estimated the following parameters recorded in the last year: blood glucose (BG), blood pressure (BP), total cholesterol (TC), body mass index (BMI), HbA1c, foot examination, eye examination and protein in urine. Data from records are documented on special forms for Audits DM that are designed according to the instructions of recording parameters from the European guidelines to the prevention of Cardiovascular disease which is passed from Committee of the European Society of Cardiology clinical guidelines (18).

The study included patients with diabetes mellitus type 2, both men and women older than 18 years. Data were analyzed for total of 120 patients. Three FM specialists from Zenica and three GPs on PAT education program from Kakanj participated in the study and provided insight into the medical records of patients suffering from type 2 diabetes mellitus.

The data was analysed by standard methods of descriptive and inherent statistics. The hypotheses were tested by z-proportion tests. Statistically significant difference was defined as a P value of <0.05.

## 3. RESULTS

The study included and analyzed 120 records of patients with diabetes mellitus type 2 as follows: 60 records from 3 FMT and 60 records from 3 PAT teams taken from the files or registry of patients with type 2 DM. In total patients sample female gender were dominated for all teams (74; 61%) vs. men (46; 38.3%). Average number of type 2 diabetes FMT vs. PAT by gender: women 50% compared to 72%, 50% of men compared to 28%, where it be noted a statistically significant difference in the gender structure among groups (X<sup>2</sup> = 5958, P = 0.014) (Table 1). In total number for all teams dominated patient age groups were over 60 years (73, 60%) compared to age <40 years (4, 3.3%). Compared of FMT vs. PAT teams diabetics by age were: age <40 g. (1, 1.6%) vs. (3, 5%), age 40-50g. (21, 35%) vs. (22, 36%), age > = 60 g. (38, 63%) vs. (35, 58) with no ob-

served statistically significant differences in age of patients in the studied groups (X<sup>2</sup> = 1147, P = 0563) (Table 1).

Evidented parameters of macrovascular control in total for all teams the best of evidence in last year were for BP (with 51.6%) and BG (with 44.1%), the worst of evidence observed in parameter TC from the 28.3% and BMI in 46% diabetic patients records (table 2). Per group FMT compared with PAT teams had a statistically significantly better evidence in the last year on 3 of 4 parameters, and the best of evidence found at the BP parameters registered in 70% of cases vs. 33% with statistical significance differences (X<sup>2</sup>=14.716, p=0.0001) (Table 2).

Table 2. show evidenced parameters for microvascular control in total for all teams and the best of evidence in last year found for protein in urin with 63.6% and HbA1c with 58.3% while the worst of evidence observed in parameter foot exam in 53.3% and eye exam in 56.6% diabetic patients records (table 2). Unexpectedly, per group FMT compared with PAT teams had statistically significantly worsen of evidence in the last year on 3 of 4 parameters, and the

Type 2 diabetic patients (n=60)	FMT N (%) (n=60)	PAT N (%) (n=60)	Total N (%) (n=120)
1. Patients characteristics by gender: 1.1. Total number of women in the audit 1.2. Total number of men in the audit	30 (50) 30 (50)	44 (72) 16 (28)	74 (61)*** 46 (38.3)***
2. Patients characteristics by age : 2.1. Years of age < 40 years 2.2. Years of age 40-59 years 2.3. Years of age †	1 (1.6) 21 (35) 38 (63)	3 (5) 22 (36) 35 (58)	4 (3.3) 43 (35.8) 73 (60)

Table 1. FMT\* vs. PAT\*\*: Characteristics of type 2 diabetic patients. \* Family Medicine specialists Teams, \*\* Teams on Program Additional Training, \*\*\* statistically significant difference

Type 2 diabetic patients (n=60)	TOM N (%) (n=60)	PAT N (%) (n=60)	Statistical method z- tests	TOTAL N (%) (n=120)
1. Parameters of macrovascular control evidenced in last year 1.1. Evidenced of blood glucose 1.2. Evidenced of blood pressure 1.2. Evidenced of total cholesterol 1.3. Evidenced of body mass index	35 (58) 42 (70) 21 (35) 29 (48)	18 (30) 20 (33) 13 (22) 17 (28)	(X <sup>2</sup> =8,651 p=0,003) *** (X <sup>2</sup> =14,716 p=0, 0001) *** (X <sup>2</sup> =2,011 p=0,156) (X <sup>2</sup> =4,266 p=0,038) ***	53 (44.1) 62 (51.6) 34 (28.3) 46 (38.3)
2. Parameters of microvascular control evidenced in last year 2.1. HbA1c level 2.2. Foot exam 2.3. eye exam 2.4. protein in urin (urinoanalysis)	25 (41) 17 (26) 29 (48) 23 (38)	45 (75) 47 (78) 39 (65) 53 (88)	(X <sup>2</sup> =12,377 p=0, 0004) *** (X <sup>2</sup> =28,158 p<0, 0001) *** (X <sup>2</sup> =2,749 p=0,097) (X <sup>2</sup> =30,179 p<0, 0001) ***	70 (58.3) 64 (53.3) 68 (56.6) 76 (63.6)

Table 2. FMT\* vs. PAT\*\*: Evidented parameters of micro-and macrovascular complications in type 2 diabetics. \* Family Medicine specialists Teams, \*\* Teams on Program Additional Training, \*\*\* statistically significant difference

worst evidence found for parametar protein in urin on 38% vs. 88% diabetic patients records with statistical significant ( $X^2=30.179$ ,  $p<0.0001$ ) and parametar foot exam made in last year with statistical significant ( $X^2=28.158$ ,  $p<0.0001$ ).

#### 4. DISCUSSION

According to "Guide through Accreditation for family medicine teams and clinics Republika Srpska" all patientst with dijabetes registered in FMT need to have in patients medical file records in last year: BMI; HbA1c; profil of lipid and blood pressure for every 80% participants (19). In our audit did not found that high percentage of evidenced parameters for all teams separatly until groups FMTs were closer to a satisfactory percentage with parametar blood pressure with 70%, and PATs with parametar HbA1c measured in last year with 75%.

On the other hand, according to recommendations published in "Accreditation standards for Family Medicine Teams from 2008." percentage of diabetic patients whom need to be evidenced in medical chart in last 15 months: BMI, HbA1c, lipid profil, mesured blood pressure and done test on microalbuminuria amounts at least 25% and a maximum of 90% of patients (20). In our audit total of evidenced parameters in higher percentage than 25% found at FMTs in regard to PATs for BG (35% vs. 18%), BP (42% vs. 20%) and BMI (29% vs. 17%) as a parametar of macrovascular control. Opposite of that PATs had higher percentage than 25% of evidenced parameter macrovascular control for foot exam (47% vs. 17%), eye exam (39% vs. 29%) and protein in urine (53% vs. 23%). HbA1c evidenced on those criteria were in satisfactory percentage for all teams although in significantly higher percentage for PAT (45% vs. 25%).

Studies which examined how well Family medicine doctors doing at the recommended guidelines for the management of DM showed that ther ordinary work is suboprimal (9, 12). Actually, our study showed an unsatisfactory record of parametars macrovascular control for PAT temas and microvascular control for FMTs.

Interventions wich results with most positiv changes in chronic disease management includes work on four

fields: changes in medical behavior, better organization of practices, developing of information systems and education or/and giving supportive program for patients (19). Study which investigated the impact of multicomponent interventions which may lead to improvement of quality of care for DM by measuring 13 parameters showed that the inclusion of certain Primary care clinics in periodic visits and annual meetings can improved management and treatment for diabetics and achieve of key targets for HbA1c, lipid profil and blood pressure (21).

Bosnia ans Herzegovina study from Zenica in 2008 year, analysed a registered process indicators of DM type 2 controlled before and after implementation flowcharts for DM patients cared by Family Medicine Teams in Zenica. On sample of 853 charts the lowest percentage of regularity of evidention were seen on HbA1c (37.8%), fundus oculi (40.8%), foot exam (47.1%) and urinoanalysis (56.3%) (22, 23). Although in our study in total all teams did not not even close a satisfactory percentage of recording, per group FMTs achieved a satisfactory percentage of the recorded parameters in blood pressure in 70%, and PATs reached a satisfactory percentage for 3 of 4 parametars of microvascular control of which is the best percentage achieved for the parameter protein in urine on 88%.

#### 5. CONCLUSION

TOM teams in Zenica had a better percentage of the recorded metabolic parameters in diabetic patients in the medical records for macrovascular risk factors (glucose in blood, BP, and BMI) while PAT teams had better records for microvascular risk factors (HbA1c, foot exam and protein in urine). Our study suggests that the continuing doctors education, better organized practices, developing of information systems and educative supportive programs for patients is going to have an impact on a better monitoring of parameters in diabetic patients.

We need a new study that could examine why family medicine doctors in Zenica did not achieve satisfactory evidence of microvascular parameters according to recommended guidelines for diabetic patients.

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