Izvorni znanstveni članak / Original scientific paper

Učestalost preinačivih čimbenika kardiovaskularnoga rizika i liječenje osoba sa šećernom bolešću u Bjelovarsko-bilogorskoj županiji u razdoblju od 2001. do 2012. godine

Incidence of modifiable cardiovascular risk factors and treatment of persons suffering from diabetes in the Bjelovar-Bilogora County during the period from 2001 to 2012

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SAŽETAK: Cilj ovog rada je prikaz učestalosti preinačivih čimbenika kardiovaskularnoga rizika i vrste primijenjene terapije dijabetesa u ambulantnih pacijenata Centra za dijabetes Bjelovarsko-bilogorske županije u razdoblju od 2001. do 2012. godine.

U istraživanje je uključeno 4.408 ambulantnih pacijenata čije se povijesti bolesti nalaze u nacionalnom registru osoba sa šećernom bolešću CroDiab NET. Šećernu bolest tipa 2 imalo je 93% pacijenata, a tip 1 šećerne bolesti registriran je kod svega 3% pacijenata. Hipertenzija je bila prisutna kod 51% pacijenata uz uzlazni trend zadnje tri godine. Najviša stopa dislipidemije iznosila je 39% u 2004. godini, uz silazni trend na oko 25% zadnje 3 godine. Udio pacijenata s infarktom miokarda je stabilan na oko 10%, uz najnižu vrijednost 7,4% u 2010. godini. Učestalost pacijenata s moždanim udarom također je pokazivala trend smanjenja s 14,9% na 7,4%. Indeks tjelesne mase (ITM) <25 kg/m^2 imalo je svega 10% bolesnika, s ITM od 25 do 30 kg/m^2 bilo je 32%, dok je izrazito bolesnika s ITM >30 kg/m^2 bilo 50%. Dobru regulaciju bolesti postiglo je svega 18% pacijenata, daljnjih 18% ima graničnu regulaciju bolesti. Manje od 1% pacijenata bilo je liječeno samo promjenama životnog stila i prehrane, a oralnim lijekovima njih 43%. Kombinacija oralnih lijekova s inzulinom primjenjena je kod 38% pacijenata, a samo inzulinom bilo je liječeno 15% pacijenata.

Zaključno, priljev pacijenata u Centar za dijabetes Bjelovarsko-bilogorske županije je sve veći. Vrijednosti ITM, razine Hba1c kao i učestalosti arterijske hipertenzije i dislipidemije su zabrinjavajući. Ohrabruje pad Hba1c što je posljedica naglašene inzulinizacije, odnosno uvođenja novih lijekova poput DPP 4 inhibitora i GLP 1 analoga[9].

KLJUČNE RIJEČI: šećerna bolest, kardiovaskularni čimbenici rizika, indeks tjelesne mase, glikirani hemoglobin.

SUMMARY: The aim of this article is to present the incidence of modifiable cardiovascular risk factors and types of applied diabetes therapy in outpatients in the Center for Diabetes in the Bjelovar-Bilogora County during the period from 2001 to 2012.

The study involved 4,408 outpatients whose e-records are maintained by the national register of diabetic persons CroDiab NET. 93% of patients had type 2 diabetes, while type 1 diabetes was recorded in only 3% of patients. Hypertension was present in 51% of patients with an upward trend in the last three years. The highest rate of dyslipidemia was 39% in 2004, with a downward trend at about 25% in the last 3 years. The frequency of patients with myocardial infarction was stable at around 10%, with the lowest value of 7.4% in 2010. The prevalence of patients with stroke also showed a downward trend from 14.9% to 7.4%. Only 10% of patients had body mass index (BMI) <25 kg/m^2, while 32% of them were overweight persons with BMI from 25 to 30 kg/m^2, and 50% were obese persons with BMI >30 kg/m^2. Good disease control was achieved by only 18% of patients, a further 18% of them had borderline disease control. Less than 1% of patients were treated only by changes in lifestyle and diet, while 43% of them were treated by oral medications. The combination of oral medications with insulin was applied in 38% of patients, and only 15% of patients were treated by insulin.

To conclude, the influx of patients in the Center for Diabetes of the Bjelovar-Bilogora County is rising. The values of BMI, Hba1c levels and the incidence of hypertension and dyslipidemia are worrisome. A decrease in Hba1c which is a result of pronounced insulinization, or the introduction of new drugs such as DPP 4 inhibitors and GLP 1 analogues is encouraging.[9]

KEYWORDS: diabetes, cardiovascular risk factors, body mass index, glycated hemoglobin.

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Uvod

Šećerna bolest (DM) i njezine kronične komplikacije su veliki svjetski zdravstveni problem i u cijelom svijetu su u velikom porastu. Smatra se da trenutno u svijetu 366 milijuna ljudi boluje od DM, a do 2030. godine broj dijabetičara će se povećati na 552 milijuna. Broj oboljelih od DM povećava se u svim državama, a 80% svjetske populacije dijabetičara živi u zemljama u razvoju ili novoindustrijaliziranim zemljama[1].

Republika Hrvatska (HR) i Bjelovarsko-bilogorska županija (BBŽ) nisu izuzete iz tog trenda te prevalencija DM u Hrvatskoj iznosi 6,1%, a incidencija poremećaja metabolizma glukoze (neprimjerena glikemija na tašte) je 11,3%, što su podaci koji su viši od očekivanih[2]. U BBŽ prema popisu stanovništva iz 2011. godine živi 119.000 stanovnika. To je u odnosu na popis pred deset godina, kada je u županiji živjelo 133.000 osoba, smanjenje broja stanovnika za 14.000! Prirodni prirast iste godine iznosi -656 osoba, a prosječna starost 42 godine, što navodi na zaključak o značajnom udjelu starog stanovništva.

Poznato je da osim genetskih čimbenika pri nastanku DM, posebice tipa 2, faktori okoliša i, nadasve, životne navike snažno utjecu na učestalost pojave bolesti. Fizička neaktivnost, alkohol te prehrambene navike (gojaznost), osim što su dobro poznati faktori rizika za nastajanak DM tipa 2, doprinose i lošijoj regulaciji prisutne bolesti.[3] Prostor BBŽ spada u područja u HR u kojem se u prehrani koriste više životinjskih masti, više se dodaje sol u hranu, više se jedu rafinirani šećeri, a manje voće i povrće.[4] Ova županija spada i u područja u HR s najvećom prevalencijom potrošnje alkohola.[5] Stoga se iz godine u godinu u Centru za dijabetes BBŽ sve veći broj oboljelih od DM tipa 2.

Kardiovaskularne komplikacije su vodeći uzrok pobola i smrtnosti među pacijentima s DM, a rizik koronarne bolesti srca (KBS) je 2-4 puta veći nego u ostaloj populaciji.[6] U usporedbi sa zdravom populacijom ukupna smrtnost od infarkta miokarda (IM) je 4 puta veća među muškarcima i 7 puta veća među ženama. Srčana bolest (68%) i moždani udar (16%) su najčešći uzroci smrti u dijabetičara.[7] Dislipidemije karakterizirane visokim vrijednostima kolesterola, naročito LDL frakcijom i visokim trigliceridima te sniženom vrijednostima HDL, vrlo su čest nalaz kod dijabetičara.[8] Mnoge intervencijske studije su jasno pokazale smanjenje smrtnosti od KBS nakon regulacije hiperkolesterolemije i hipertrigliceridemije.[8] Također arterijska hipertenzija je najčešći uzrok srčanog zatajivanja.[9]

Dobra kontrola DM, odnosno smanjenje Hba1c za svega 1% smanjuje ukupni rizik razvoja dijabetičkih komplikacija za 21%, smanjuje rizik od mikrovaskularnih komplikacija za 37%, a rizik IM se smanjuje za 14%.[7]

Cilj ovog rada je prikaz kretanja preinačivih čimbenika kardiovaskularnog rizika u bazi podataka ambulantnih pacijenata s DM iz područja BBŽ.

Ispitanici i metode

Podaci su prikupljeni pomoću baze podataka računalnog programa CroDiab NET koji je u rad Centra za dijabetes BBŽ uveden 2001. godine kao dio nacionalnog registra za dijabetes.

U ovom istraživanju obrađeno je 4.408 povijesti bolesti u razdoblju od 2001. do 2012. godine s obzirom na tip DM, indeks tjelesne mase (ITM), vrstu terapije, razinu Hba1c, udio pacijenata s dislipidemijom, udio pacijenata s arterij-

Introduction

Diabetes mellitus (DM) and its chronic complications are the major world health problem having an upward trend in the whole world. It is believed that currently 366 millions of people suffer from DM worldwide, and by the year 2030 the number of diabetics will increase to 552 million. The number of patients with DM rises in all countries, and 80% percent of the world's population suffering from diabetes live in developing countries or newly industrialized countries.[1]

The Republic of Croatia (HR) and Bjelovar-Bilogora County (BBŽ) are not exempt from this trend and the prevalence of DM in Croatia is 6.1%, while the incidence of glucose metabolism disorder (fasting hyperglycemia) is 11.3%, which data exceeds our expectation.[2] According to the 2011 population census, 119,000 of citizens live in BBŽ. Compared to the population census conducted 10 years ago, when 133,000 persons lived in the County, this is a decrease in the number of population by 14,000! Natural growth in the same year amounted to -656 persons, and the average age is 42, which indicates a significant proportion of older population.

It is known that besides genetic factors for occurrence of DM, particularly of type 2, the environmental factors and especially lifestyle factors greatly influence the incidence of the disease. Physical inactivity, alcohol and eating habits (obesity), except for being well-known risk factors for the occurrence of DM type 2, also contribute to poorer control of the disease that is present.[3] The BBŽ region belongs to the regions in the HR where more animal fat is used in diet, more salt is added to food, people eat more refined sugar and less fruit and vegetables.[4] This County is classified in the regions in the HR with the greatest prevalence of alcohol consumption.[5] Therefore, each year there is an increasing number of patients suffering from DM type 2 at the Center for Diabetes in BBŽ.

Cardiovascular complications are the leading cause of morbidity and mortality among patients with DM, and the risk of coronary artery disease (CAD) is 2-4 times higher than in the general population.[6] Compared to the healthy population, the total mortality from myocardial infarction (MI) is four times higher among men and 7 times higher among women. Heart disease (68%) and stroke (16%) are the most common causes of death in diabetics.[7] Dyslipidemia characterized by high cholesterol levels, especially LDL fraction and high triglycerides and reduced HDL values are a frequent finding seen in diabetics.[8] Many intervention studies have clearly demonstrated the reduction in mortality from CHD after the regulation of hypercholesterolemia and hypertriglyceridemia.[8] Arterial hypertension is the most common cause of heart failure.[9]

Good control of DM or HbA1c reduction by only 1% reduces the overall risk of developing diabetic complications by 21%, reduces the risk of microvascular complications by 37% and reduces the risk of MI by 14%.[7]

The aim of this article is to present the trends of modifiable cardiovascular risk factors in the database of diabetic outpatients in the region of BBŽ.

Subjects and methods

Data were collected by using the database of the computer program CroDiab NET that was introduced by the Center for Diabetes BBŽ in 2001 as part of the national registry for diabetes.

This study included 4,408 anamneses processed during the period from 2001 to 2012 considering the type of DM, body

skom hipertenzijom, udio pacijenata sa preboljelim IM i preboljelim moždanim udarom. Prikazan je udio promatranih karakteristika u svih pacijenata, kao i kretanje udjela promatranih karakteristika tijekom godina.

Vrijednost ITM izračunata je po formuli ITM=tjelesna težina (kg) / tjelesna visina (m)^2. Zadovoljavajućim se smatralo vrijednost do 25, pacijenti s ITM 25-30 kg/m^2 smatraju se prekomjerno teškima, a pretilima pacijenti s ITM >30 kg/m^2.

Vrijednosti glikiranog hemoglobina (Hba1c) <6,5% smatrana je znakom dobre kontrole, graničnom su smatrane vrijednosti između 6,6%-7,5%, a vrijednost Hba1c veća od 7,5% smatrana je znakom nezadovoljavajuće kontrole bolesti.[7]

S obzirom da se radi o populaciji koja boluje od DM, za povišen arterijski tlak smatrana je vrijednost iznad 130/80 mmHg.[10]

Dislipidemijom je smatrana svaka vrijednost LDL kolesterola >2,6 mmol/L, HDL kolesterola <1,02 mmol/L, triglicerida >1,7 mmol/L.[11]

Rezultati

Učestalost promjenjivih čimbenika rizika

Tip 2 DM bio je prisutan u 93% pacijenata, a tipa 1 u svega 3% pacijenata. Drugi tipovi DM su zastupljeni svega sa 1%, a tip bolesti nije registriran kod 3% ispitanika.

Polovica (51%) ispitanika ima prisutnu arterijsku hipertenziju, 12% pacijenata je nema, a za 37% pacijenata podaci nisu poznati. Udio hipertoničara, nakon smanjenja od 2004. do 2008 godine, ponovno pokazuje uzlazni trend (**Slika 1**).

mass index (BMI), type of therapy, Hba1c level, frequency of dyslipidemia, arterial hypertension, history of MI and stroke. The frequency of observed characteristics has been presented in all patients, as well as the trend of the observed characteristics over the years.

The value of BMI was calculated by using the formula BMI = body weight (kg)/ body height (m)^2. The value up to 25 was considered normal, the patients whose BMI value was 25-30 were considered overweight, and the patients whose BMI value was BMI >30kg/m^2 were considered obese patients.

The values of glycated hemoglobin (Hba1c) <6.5% were considered to be a sign of good control, the marginal values were considered to be the values between 6.6% -7.5% and Hba1c value greater than 7.5% was considered a sign of poor disease control.[7]

Considering the fact that this is the population suffering from DM, the elevated blood pressure is considered to be the value over 130/80 mmHg.[10]

Dyslipidemia refers to the value of LDL cholesterol >2.6 mmol/L, HDL cholesterol <1.02 mmol/L, triglycerides >1.7 mmol/L.[11]

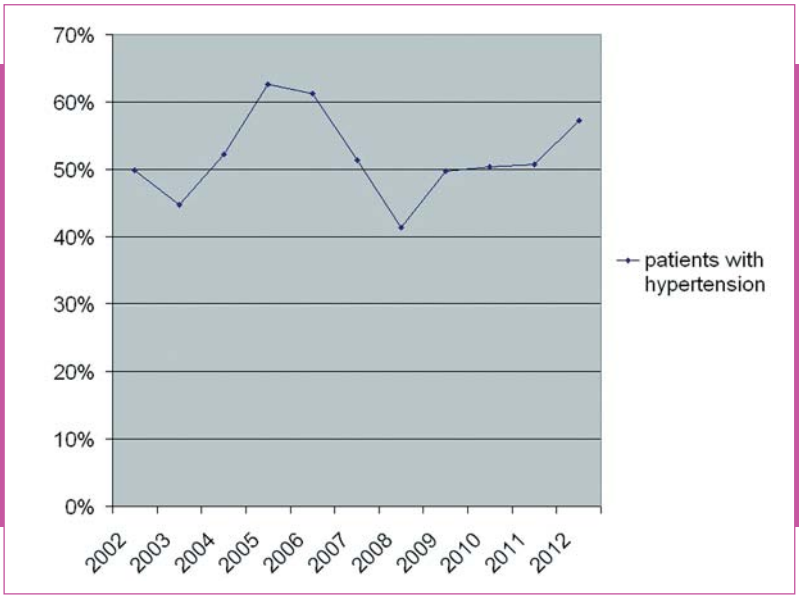
Results

Incidence of modifiable risk factors

Type 2 DM was recorded in 93% of patients and type 1 in only 3% of patients. Other types of DM are represented with only 1%, and the type of disease is not recorded in 3% of subjects.

A half (51%) of the subjects has arterial hypertension present, 12% of patients do not have it, no data is known for 37% of patients. The frequency of hypertensive patients, after this number was reduced from 2004 to 2008 shows an upward trend again (**Figure 1**).

Figure 1.
The frequency of patients with hypertension from 2001 to 2012.



Udio pacijenata s dislipidemijom prikazan je na **slici 2** i pokazuje svoj vHRunac od 39% za 2004. godinu, s ipak silaznim trendom i udjelom od oko 25% u zadnje tri godine.

Udio pacijenata s preboljelim IM u promatranom razdoblju kreće se oko 10%, s najvećom učestalosti od 15% u 2007. i najmanjoj od 7% u 2010. godini.

The frequency of patients with dyslipidemia is shown in **Figure 2** and reached its peak of 39% in the year 2004, however, showing a downward trend and with the proportion of about 25% in the last three years.

The proportion of patients with the history of MI in the observed period is around 10%, with the highest incidence rate of 15% in 2007 and a lowest incidence rate of 7% in 2010.

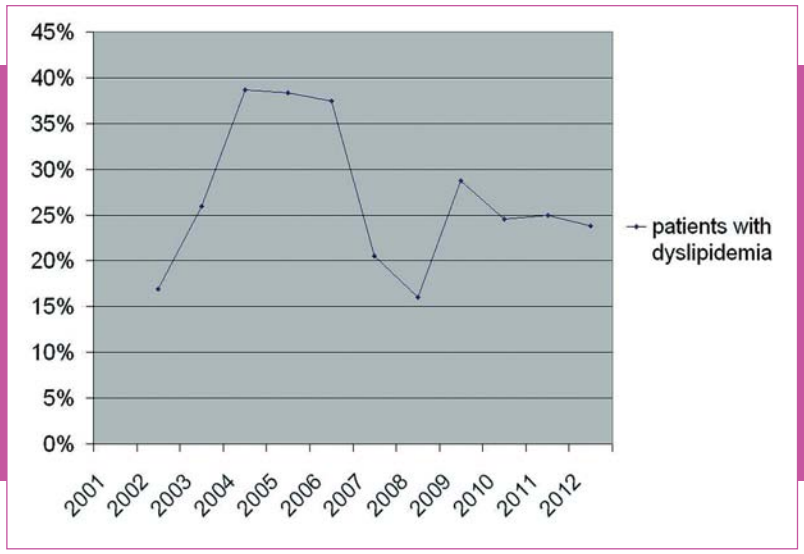


Figure 2.
The frequency of patients with dyslipidemia from 2001 to 2012.

Udio pacijenata s preboljelim moždanim udarom iznosio je 9%, a registrira se smanjenje udjela sa 14,89% na 7,44%, naročito tijekom zadnje 3 godine.

Vrijednost ITM <25 kg/m^2 ima svega 10% bolesnika, od 25-30 kg/m^2 njih 32%, a pretilih bolesnika s ITM >30 kg/m^2 je 50%, dok u 8% ispitanika ITM nije ubilježen. **Slika 3** pokazuje kretanje ITM. Registrira se porast udjela pacijenata s vrijednostima ITM >30 kg/m^2 te se približava brojci od 60%. Udio pacijenata sa ITM <25 kg/m^2 je stabilno oko 10%, a udio pacijenata s ITM od 25-30 kg/m^2 pokazivao je trend smanjenja od 2005. do 2011., uz porast u 2012. godini.

The proportion of patients with the history of stroke was 9%, whereas a decline of the proportion of patients has been recorded from 14.89% to 7.44%, especially during the last 3 years.

The BMI value <25 is recorded in only 10% of patients, 32% of them in range 25-30 kg/m^2 of patients, and 50% were obese patients with BMI >30 kg/m^2, while BMI was not recorded in 8% of patients. **Figure 3** shows the trends of BMI. An increase in the proportion of patients with values of BMI >30 kg/m^2 has been recorded and it is approaching the figure of 60%. The proportion of patients with BMI <25 kg/m^2 is stable at around 10%, and the proportion of patients with BMI in range 25-30 kg/m^2 showed a downward trend from the year 2005 to 2011, with an increase in 2012.

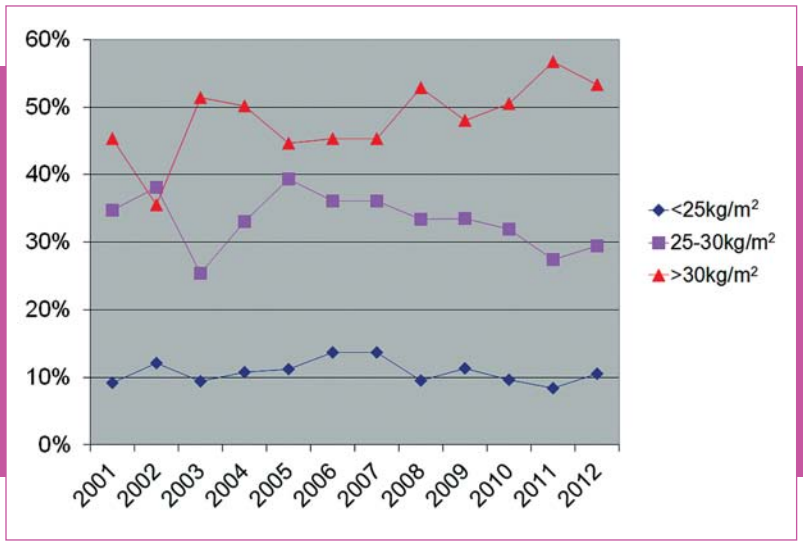


Figure 3.
The frequency of patients with different body mass indexes from 2001 to 2012.

Vrijednost Hba1c

Dobru regulaciju, odnosno Hba1c <6,5% imalo je 18% ispitanika, a graničnu vrijednost Hba1c (između 6,6-7,5%) imalo je 18%. Vrijednost Hba1c višu od 7,5% imalo je 34% bolesnika. Kod 30% ispitanika vrijednost Hba1c nije bila poznata. Promatrajući kretanje Hba1c kroz godine (**slika 4**) vidljivo je da udio pacijenata sa nepoznatim Hba1c kroz godine kontinuirano pada do ispod 20%. Vrijednost Hba1c višu od 7,5% godinama je imalo oko 40% ispitanika. Tek u zadnje

Hba1c values

Good regulation or Hba1c <6.5% was recorded in 18% of subjects, and the limit value of Hba1c (between 6.6 to 7.5%) was recorded in 18%. 34% of patients had the Hba1c value over 7.5%. Hba1c value was not known for 30% of subjects. The trend of Hba1c over the years, showing that the proportion of patients with unknown Hba1c has been continuously falling over the years to below 20% (**Figure 4**). 40% of patients had the Hba1c value greater than 7.5%. The decline

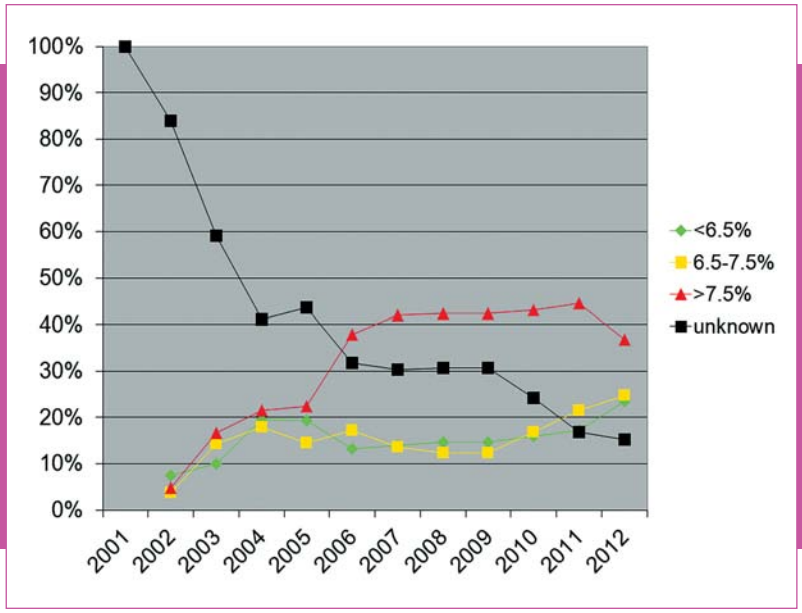


Figure 4.
The frequency of patients with different values of HbA1c from 2001 to 2012.

dvije godine zamjetno je smanjenje udjela pacijenata s Hba1c >7,5%. Dobro regulirani pacijenti sa Hba1c <6,5%, kao i granično regulirani pacijenti s vrijednosti 6,5-7,5% godinama su imali udjel oko 20%. Tek zadnje dvije godine prati se porast njihovog udjela na iznad 20%.

Vrsta primjenjenog liječenja

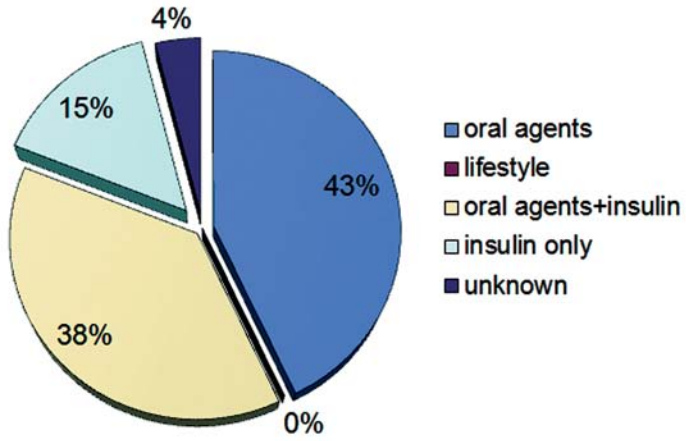
U prikaz terapije (**slika 5**) uključena su 1.102 pacijenta. Zanemarivi udio pacijenata (<1%) liječen je samo promjenama životnog stila i prehrane. Daleko najviše pacijenata liječeno je oralnim lijekovima (43%). Oralna sredstva s inzulinom uzima 38% pacijenata, a samo inzulinom liječeno je 15% pacijenata.

in the proportion of patients with Hba1c >7.5% has been significant in the last two years. Well regulated patients with Hba1c <6.5%, and the patients with HbA1c values from 6.5-7.5% showed a proportion around 20% over the years. Only in the last two years an increase in their proportion over 20% has been monitored.

Types of applied treatment

1,102 patients have been included in the therapy presentation (**Figure 5**). A negligent proportion of patients (<1%) was only treated by changes to lifestyle and diet. The greatest number of patients were treated with oral medications (43%). 38% of patients take oral agents with insulin and 15% of patients are treated only by insulin.

Figure 5.
Patient distribution according to the type of used therapy.



Kretanje udjela pojedinih vrsta terapije kroz promatrano vremensko razdoblje vidljivo je na **slici 6**. U posljednje dvije godine terapija bazirana samo na oralnim sredstvima je u padu, kao i terapija samo inzulinom. Najveći rast bilježi uporaba kombinacije oralnih sredstava i inzulina.

The movement of shares of certain types of therapies throughout the observed time period is shown in **Figure 6**. In the last two years, the therapy based only on oral agents as well as the therapy by insulin only is in decline. The greatest rise has been recorded by the combination of oral agents and insulin.

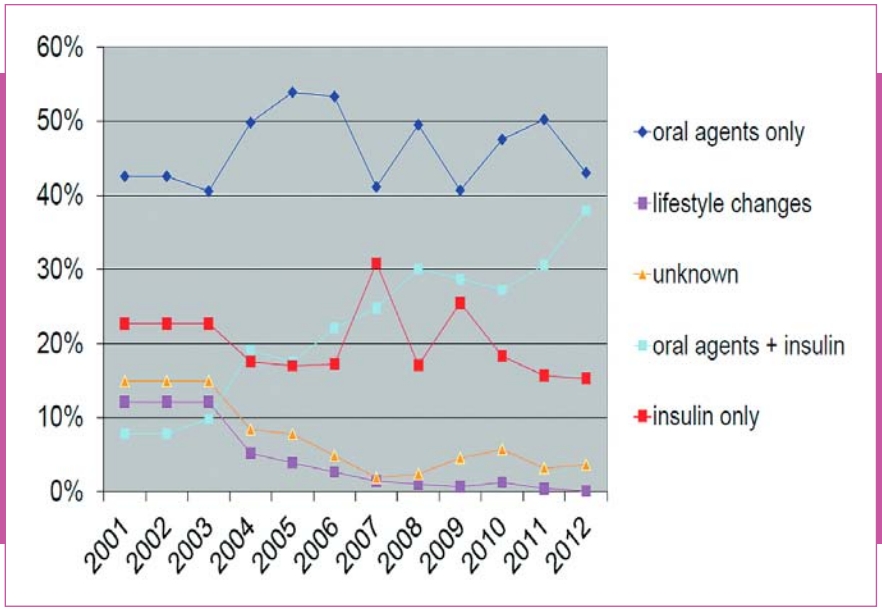


Figure 6.

The frequency of different therapy types for diabetes from 2001 to 2012.

Diskusija

Prema podacima CroDiab NET za 2006. godinu na razini HR svega 21,6% pacijenata ima vrijednost Hba1c <6,5%, odnosno dobru regulaciju DM, dok je za 2012. godinu taj postotak iznosio 26,9%.[12] Podaci za promatrane ispitanike iz BBŽ još su lošiji. Samo 18% promatrane populacije ima dobru regulaciju glikemije, ali ohrabruje činjenica da postoji tendencija porasta udjela dobro i granično reguliranih pacijenata uz pad udjela pacijenata sa izrazito visokim Hba1c (iznad 7,5%) u zadnje dvije godine. Također ohrabruje podatak o sve manjem postotku pacijenata sa nepoznatim Hba1c koji se na početku promatranog razdoblja uopće nije određivao u Općoj bolnici Bjelovar (i dalje se ne radi u laboratorijima Domova zdravlja BBŽ), što znači da su se upornošću i pacijenti i njihovi liječnici naviknuli na potrebu praćenja ovog nalaza.

Preko 50% pacijenata ima registriranu i liječenu arterijsku hipertenziju. Za 37% pacijenata podaci nisu poznati te je moguće da je i među njima također ima hipertoničara. Ovaj podatak odgovara podacima o nedijagnosticiranoj hipertenziji u Mongoliji gdje 35% stanovnika nije dijagnosticirano.[13] S druge strane, postoje procjene da u Kanadi 13% populacije ima hipertenziju, a 4,2% šećernu bolest.[14] Kanadska studija CCHC iz 2003. također potvrđuje prevalenciju hipertenzije od 12,7%.[15] Iranska studija iz 2005. pronalazi 20,8% hipertoničara u ispitivanoj populaciji dijabetičara tipa 2.[16]

U pacijenata s DM često je prisutna i dislipidemija. Prekomjerna količina slobodnih masnih kiselina povećava hepatičku glukoneogenezu, povećava se beta stanična lipotoksičnost. Uravnoteženi metabolizam kolesterola je važan za sposobnost lučenja inzulina iz beta stanice.[17] Udio pacijenata sa dislipidemijom u od 25% odgovara udjelu iz njemačke studije iz 2006. godine od 24,4%.18 Studija iz Južne Karoline iz 2011. godine navodi da među Afroamerikancima 62% ima prekomjernu težinu, 64% ima hipertenziju, 23% DM, a 40% dislipidemiju. Tri čimbenika rizika (hipertenzija, debljina, dislipidemija) bila su prisutna u 13%, a u 10% četiri čimbenika rizika (hipertenzija, debljina, dislipidemija i DM).[19]

Pad udjela pacijenata s dislipidemijom korespondira sa snižavanjem vrijednosti Hba1c posljednjih 3 godine.

Discussion

According to the data of CroDiab NET for the year 2006 only 21.6% of patients have the value of Hba1c <6.5% at the level of the HR, or the good regulation of DM, while in the year 2012 this percentage was 26.9%.[12] The data for the observed subjects from BBŽ are worse. Only 18% of the observed population has good glycemic control, but there is an encouraging fact that there is an upward trend of well regulated and marginally regulated patients with a decline in the proportion of patients with very high Hba1c (over 7.5%) in the last two years. There is also encouraging data concerning ever smaller percentage of patients with unknown Hba1c that at the beginning of the observed period was not determined in the Bjelovar General Hospital at all (still is not determined in the laboratory of the Health Centres in BBŽ), which means that by being persistent, both patients and their physicians got accustomed to the need of monitoring this result.

Over 50% of patients have been recorded and treated for arterial hypertension. The data have not been known for 37% and it is possible that there are hypertensive patients among them. This data corresponds to the data on non-diagnosed hypertension in Mongolia where 35% of inhabitants have not been diagnosed.[13] On the other hand, there are estimates that 13% of the population have hypertension and 4.2% have diabetes in Canada.[14] The 2003 Canadian study CCHC also confirms the prevalence of hypertension by 12.7%.[15] The 2005 Iranian study finds 20.8% of hypertensive patients in the surveyed population of diabetics type 2.[16]

Dyslipidemia is commonly present in patients with DM. An excessive amount of free fatty acids increases hepatic gluconeogenesis, whereas beta cell lipotoxicity is increased. Balanced cholesterol metabolism is important for the ability of insulin secretion from the beta cell.[17] The proportion of patients with dyslipidemia of 25% corresponds to the proportion of 24.4% mentioned in the 2006 German study.[18] The 2011 South Carolina study suggests that 62% of African Americans are overweight, 64% of them have hypertension, 23% of them have DM and 40% of them have dyslipidemia. Three risk factors (hypertension, obesity, dyslipidemia) were

Pojavnost KBS je značajno povezana sa DM. Tako se navodi u studiji iz Irana iz 2006 godine da je prevalencija koronarne bolesti među dijabetičarima 28%.[20] S druge strane prevalencija KBS među dijabetičarima u Koreji je 8,7%.[21]

Rezultati retrospektivne studije bazirane na podacima o 297 pacijenata liječenih od akutnog IM u Općoj bolnici Bjelovar iz 2001. godine pokazuju da je među pacijentima 24% muškaraca i 37% žena imalo DM. U 32% muškaraca i 37% žena s fatalnim ishodom akutnog IM registriran je DM. Dijabetičari s fatalnim ishodom IM bili su mlađi u odnosu na pacijente bez DM.[22]

Udio pacijenata s preboljelim IM iznosio je 10% i cijelo promatrano razdoblje je gotovo nepromijenjen, s najnižim udjelom 2010. godine. Istodobno te godine počinje rasti postotak pacijenata koji su dobro ili granično dobro regulirali DM.

Udio pacijenata sa drugom promatranom makrovaskularnom komplikacijom dijabetesa (moždanim udarom) iznosi 9%. Trend smanjenja udjela pacijenata sa preboljelim moždanim udarom na 7% također je u obrnutoj korelaciji s dobro ili granično dobrom reguliranom šećernom bolesti, što je vidljivo zadnje 3 godine. Većina studija koja je proučavale moždane udare u bolničkim populacijama navodi da 10-25% pacijenata sa moždanim udarom ima DM.23

Zaključak

Vrlo visoke i sve više stope pojavnosti DM u svijetu i Hrvatskoj, navode na zabrinutost. U Centru za dijabetes BBŽ suočeni smo sa sve većim priljevom pacijenata. Razina reguliranosti šećerne bolesti, indeks tjelesne mase, kao i ostalih promatranih preinačivih čimbenika rizika kardiovaskularnih bolesti (arterijska hipertenzija, dislipidemija) nije zadovoljavajuća. Ohrabruje silazni trend razine vrijednosti Hba1c što je vjerojatno posljedica uvođenja novih lijekova za liječenje DM (DPP 4 inhibitora i analoga GLP 1), kao i naglašenog uvođenja inzulina u zadnje tri godine. To će vjerojatno ipak uroditi smanjenim udjelom pacijenata s infarktom miokarda i moždanim udarom.

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present in 13% of them, and four risk factors were present in 10% (hypertension, obesity, dyslipidemia and DM).[19]

Decline in the proportion of patients with dyslipidemia corresponded with reductions of Hba1c value in the last three years.

The incidence of CHD is significantly linked with DM. Thus, the 2006 Iran study suggests that the prevalence of coronary heart disease among the diabetics is 28%.[20] On the other hand, the prevalence of CHD among the diabetics in Korea is 8.7%.[21]

The results of the 2001 retrospective study based on the data on 297 patients treated for acute MI in the Bjelovar General Hospital show that among the patients 24% of men and 37% of women had DM. DM was recorded in 32% of men and 37% of women with fatal outcome of acute MI. Diabetic patients with fatal outcome of MI were younger than patients without DM.[22]

The proportion of patients with history of MI was 10% and the entire observed period remained almost unchanged, with the lowest proportion in 2010. At the same time, during that year the rate of patients who controlled DM well or marginally well started to rise.

The proportion of patients with other observed macrovascular complication of diabetes (stroke) is 9%. The tendency of decline of patients with a history of stroke to 7% is also inversely correlated with well or marginally well regulated diabetes which has been seen in the last 3 years. Most studies that examined stroke in the hospital population suggest that 10-25% of patients suffering from stroke have DM.[23]

Conclusion

Very high and ever higher rates of incidence of DM in the world and in RH raise the concern. We are facing ever greater number of patients in the Centre for Diabetes in BBŽ. The level of regulation of diabetes, body mass index, as well as other observed modifiable cardiovascular disease risk factors (arterial hypertension, dyslipidemia) is not satisfactory. The downward trend of the level of Hba1c value is encouraging, which is probably the consequence of introduction of new drugs for the treatment of DM (DPP 4 inhibitors and GLP 1 analogues), and pronounced introduction of insulin in the last three years. It would probably result in the reduced proportion of patients with myocardial infarction and stroke.

Literature

1. IDF Diabetes atlas. Fifth edition. http://www.idf.org/diabetesatlas (8.5.2013).
2. Metelko Z, Pavlic-Renar I, Poljicanin T, Szirovitza L, Turek S. Prevalence of diabetes mellitus in Croatia. Diabetes Res Clin Pract. 2008;81(2):263-7.
3. Hu G, Lindstr J, Valle TT, Eriksson JG, Jousilahti P, Silventoinen K, et al. Physical activity, body mass index, and risk of type 2 diabetes in patients with normal or impaired glucose regulation. Arch Intern Med. 2004;164(8):892-6.
4. Kaic-Rak A, Pucarin-Cvetkovic J, Kulier I. Dietary habits: Croatian Health Survey. Acta Med Croatica. 2007;61(3):259-65.
5. Bencevic-Striehl H, Malatestinic D, Vuletic S. Regional differences in alcohol consumption in Croatia, Coll Antropol. 2009;33 Suppl 1:39-41.
6. Li YW, Aronow WS. Diabetes Mellitus and Cardiovascular Disease. J Clinic Experiment Cardiol, 2011;2:114.
7. Magaš S. Diabetes and coronary artery disease: the importance of glycemic control. Cardiol Croat. 2012;7(1-2):27-32.
8. Viswanathan M, Janarthanan VV, Rajendra P. Epidemiology of cardiovascular disease in type 2 diabetes: the Indian scenario. J Diabetes Sci Technol. 2010; 4(1):158-70.
9. Shannon MD, Susan AW, Steven JJ, Veronique LR. Risk factors for heart failure: a population-based case-control study. Am J Med. 2009;122(11): 1023-8.
10. American Diabetes Association. Standards of medical care in diabetes - 2012. Diabetes Care. 2012;35(supplement 1):S11-S63.
11. Haffner SM; American Diabetes Association. Dyslipidemia management in adults with diabetes. Diabetes Care. 2004;27 Suppl 1:S68-71.
12. Analiza podataka CroDiab registra za 2012. godinu. http://www.idb.hr/CDN_20120430.pdf (8.5.2013).
13. Dugee O, Sophal O, Enkhtuya P, Manju R, Brian SB. Individual-based primary prevention of cardiovascular disease in Cambodia and Mongolia: early identification and management of hypertension and diabetes mellitus. BMC Public Health. 2012;12:254.

14. Tanuseputro P, Manuel DG, Leung M, Nguyen K, Johansen H. Risk factors for cardiovascular disease in Canada. Can J Cardiol. 2003;19(11):1249-59.

15. Mo F, Pogany LM, Li FC, Morrison H. Prevalence of diabetes and cardiovascular comorbidity in the Canadian Community Health Survey 2002-2003. ScientificWorldJournal. 2006;6:96-105.

16. Janghorbani M, Amini M. Hypertension in type 2 diabetes mellitus in Isfahan, Iran: incidence and risk factors. Diabetes Res Clin Pract. 2005;70(1):71-80.

17. Bardini G, Rotella CM, Giannini S. Dyslipidemia and diabetes: reciprocal impact of impaired lipid metabolism and beta-cell dysfunction on micro- and macrovascular complications, Rev Diabet Stud. 2012;9(2-3):82-93.

18. Schaefer JR, Gitt AK, Sonntag F, Weizel A, Jannowitz C, Karmann B, et al. Lipid management in 13,000 high risk cardiovascular patients treated under daily practice conditions: LIMA Registry. Vasc Health Risk Manag. 2013;9:71-80.

19. Baruth M, Wilcox S, Egan BM, Dowda M, Laken M, Warren TY. Cardiovascular disease risk factor clustering among African American adults. Ethn Dis. 2011;21(2):129-34.

20. Janghorbani M, Amini M, Tavassoli A. Coronary heart disease in type 2 diabetes mellitus in Isfahan, Iran: prevalence and risk factors. Acta Cardiol. 2006;61(1):13-20.

21. Kang HM, Lee YJ, Kim DJ. The association of self-reported coronary heart disease with diabetes duration in Korea. Diabetes Metab J. 2012;36(5):350-6.

22. Ivanuša M, Klobučić M, Soukup Podravec V. Influence of diabetes mellitus on mortality after acute myocardial infarction. Acta clin Croat. 2001;40 Suppl:109.

23. Hewitt J, Castilla GL, Fern·ndez-Moreno MC, Sierra C. Diabetes and stroke prevention: a review. Stroke Res Treat. 2012;2012:673187.