

# Psihosocijalne karakteristike kao čimbenici rizika i prediktori razvoja koronarne bolesti srca

## Psychosocial characteristics as risk factors and predictors of coronary artery disease

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Koronarna bolest srca (KBS) je najčešći uzrok morbiditeta i mortaliteta u razvijenim zemljama svijeta<sup>1,2</sup>. U Hrvatskoj su prema zadnjim istraživanjima ishemijske bolesti srca i cerebrovaskularne bolesti vodeći uzrok mortaliteta i na njih otpada 50,26% svih uzroka smrti<sup>3</sup>. Na prijelazu stoljeća je pokazano da bi očekivani mortalitet od KBS u ekonomski razvijenim zemljama trebao rasti u muškaraca 29%, a u žena oko 48% u razdoblju od 1990. do 2020. godine.

Incidencija razvoja KBS niža je u žena nego u muškaraca prije pedesete godine života, nakon toga se povećava i izjednačuje s incidencijom u muškaraca u osamdesetim godinama života<sup>4</sup>. Jedan od razloga je protektivni učinak ženskih spolnih hormona, ali i različite prehrambene navike te razlika incidencije pušenja među spolovima<sup>5</sup>. Bolesnici zbog KBS u Hrvatskoj se prosječno hospitaliziraju u 63 godini života, muškarci u 61. godini života, a žene sedam godina kasnije — u 68. godini života, neovisno o tome imaju li akutnu ili kroničnu KBS i kojoj regiji pripadaju<sup>6</sup>.

Tradicionalno se kao četiri glavna čimbenika rizika KBS navode arterijska hipertenzija, pušenje, hiperlipoproteinemija i dijabetes<sup>7</sup>. U novije vrijeme, razvojem tzv. modernog načina života, sve se više spominju psihološke, socioekonomske i prehrambene karakteristike kao mogući čimbenici rizika KBS.

Studije provedene prije više od desetljeća su pokazale značajno nižu incidenciju razvoja KBS u zemljama Mediterana u odnosu na kontinentalne zemlje Europe<sup>8,9</sup>. Novija ispitivanja pokazuju smanjenje različitosti u incidenciji KBS u prehrambenim i psihosocijalnim navikama u mediteranskim i kontinentalnim zemljama<sup>10,11</sup>. Konzumiranje povrća, citratnog voća te vitaminom C bogatog voća i povrća smanjuje rizik razvoja cerebrovaskularnog inzulta i KBS, međutim sam sintetski vitamin C i beta karoten izgleda da nemaju takav učinak<sup>12,13</sup>. Osobe koje uzimaju veću količinu vlaknima bogate hrane imaju 40-50% sniženje rizika razvoja KBS. Među regijama u Hrvatskoj nema statistički značajne razlike u kvaliteti prehrane, indeks zdrave prehrane je na žalost nizak u svim regijama<sup>6</sup>.

Povezanost socioekonomskih čimbenika i KBS je kompleksna, prema podacima studija razvoj KBS posljedica je indirektnih čimbenika koji proizlaze iz socioekonomskog statusa. Niži socioekonomski status obično je povezan s lošijom

Coronary heart disease (CHD) is the most common cause of morbidity and mortality in developed countries<sup>1,2</sup>. In Croatia, according to the latest investigations, ischemic heart disease and cerebrovascular disease are the leading cause of mortality and account for 50.26% of all causes of death<sup>3</sup>. At the turn of centuries, it was shown that the expected mortality from CHD in economically developed countries is expected to rise in men by 29% and in women by 48% during the period from 1990 to 2020.

The incidence of developing CHD is lower in women than in men before the age of fifty, only to be risen and equalized with the incidence in men in the eighties<sup>4</sup>. One of the reasons is the protective effect of female sex hormones, but also different eating habits and the difference in the incidence of smoking among men and women<sup>5</sup>. The Croatian patients are on the average hospitalized at the age of 63, men at the of 61 and women seven years later — at the age of 68 for CHD, regardless of whether they have acute or chronic CHD and which region they belong to<sup>6</sup>.

Traditionally, hypertension, smoking, hyperlipoproteinemia and diabetes are indicated as the four major CHD risk factors<sup>7</sup>. In recent years, with the development of the so-called modern way of life, psychological, socioeconomic and dietary characteristics are more and more mentioned as the potential CHD risk factors.

Studies conducted over a decade ago showed a significantly lower incidence of developing CHD in the Mediterranean countries than in the countries of continental European countries<sup>8,9</sup>. Recent studies show smaller differences in the incidence of CHD in the dietary and psychosocial habits in the Mediterranean and continental countries<sup>10,11</sup>. Eating vegetables, citrus fruit and fruit and vegetables rich in vitamin C reduces the risk of development of cerebrovascular insult and CHD, but the synthetic vitamin C and beta carotene do not seem to have such an effect<sup>12,13</sup>. People who take a greater amount of food rich in fiber have a 40-50% lower risk of developing CHD. Among the regions in Croatia, there is no statistically significant difference in the quality of nutrition and the healthy eating index is unfortunately low in all regions<sup>6</sup>.

The connection of socioeconomic factors and CHD is complex, according to study data, the development of CHD is a

preventivnom medicinom, lošijom prehranom te svakodnevnim stresogenim egzistencijalnim problemima, što može dovesti do psiholoških problema od depresije do anksioznosti. Psihosocijalni i socioekonomski čimbenici se isprepliću, međusobno utječu jedan na drugoga i uglavnom se međusobno potenciraju. Neke studije su pokazale jasnu povezanost socioekonomskog statusa s povećanim mortalitetom i morbiditetom. Studije su utvrdile da su osobe nižeg socioekonomskog statusa češće pušači, pretili, fizički neaktivni, vrlo često alkoholičari te imaju visoku razinu kolesterola i triglicerida u krvi<sup>14,15</sup>.

Tijekom vremena, razina edukacije je postala sve češći marker socioekonomskog statusa. Većina ispitivanih studija pokazuje obrnutu povezanost stupnja edukacije, rizičnih čimbenika za razvoj KBS te razvoj KBS<sup>16</sup>. Lošije educirane žene su češće pušači u Finskoj, Nizozemskoj, Norveškoj, Njemačkoj, Engleskoj, Švedskoj i Švicarskoj, a manje u Španjolskoj, Portugalu te nakon 45 god. života u Francuskoj i Italiji<sup>17</sup>. U Hrvatskoj educiraniji i muškarci i žene više pažnje poklanjaju fizičkoj aktivnosti, ali i konzumiraju veće količine alkohola i češće su pušači<sup>6</sup>.

Akutni emocionalni, kao i fizički stres mogu dovesti do povećanja simpatičke aktivnosti što može uzrokovati rupturu vulnerabilnog plaka i okluziju koronarne arterije. Viši tonus simpatikusa dovodi do vazokonstrukcije osobito već aterosklerotski promijenjene koronarne arterije što pogoduje razvoju ishemije miokarda<sup>18,19</sup>. Akutni stres zbog gubitka bliske osobe ili fizičkog napada je dokumentiran čimbenik rizika KBS u nekoliko studija, velikim dijelom i kao posljedica razvoja endotelne disfunkcije, dok je kronični stresogeni učinak još uvijek nedovoljno jasno istražen, ali vjerojatno povezan s visokom razinom kortizola u krvi, abdominalnom debljinom te hiperlipoproteinemijom i endotelnom disfunkcijom<sup>20,21</sup>. Akutni emocionalni stres češće je povezan s razvojem akutnog infarkta miokarda u žena nego u muškaraca<sup>22</sup>. Spolne razlike u autonomnoj inervaciji i regulaciji miokarda te odgovor lijeve klijetke na ishemiju još nisu dovoljno istražene<sup>23</sup>.

Stresom inducirane aterosklerotske promjene koronarnih arterija su dokazane u životinjskim modelima<sup>24</sup>. Prospektivne studije su pokazale da je stres na poslu povezan s povećanim rizikom morbiditeta i mortaliteta od KBS, čak i neovisno o pušenju i drugim čimbenicima rizika<sup>25</sup>. Poslovni stres kao mogući čimbenik rizika KBS ima 12,2 % bolesnika; 15% muškaraca u kontinentalnoj Hrvatskoj ima poslovni stres u vidu neuspjeha ili gubitka posla, dok u mediteranskoj 8,7% bolesnika<sup>6</sup>. Anksiolitici u kombinaciji s beta-blokatorima mogu smanjiti vulnerabilnost miokarda<sup>22</sup>.

Mjerenje kvalitete života opisuje vlastito poimanje zdravstvenog statusa te bi se trebalo uzeti u obzir s tradicionalnim ocjenjivanjima fizičkog i psihičkog statusa kao i istraživanjima<sup>26,27</sup>. Na temelju upitnika SF-36 Hrvatskoj fizički status je bio lošiji nego psihički u bolesnika s KBS u odnosu na opću populaciju, također u svim varijablama su žene imale lošije vlastito poimanje zdravlje u odnosu na muškarce<sup>6</sup>.

Kao što postoji čitav niz mogućih čimbenika za razvoj KBS tako postoji i veliki broj izračunskih prediktora za mogući rizik razvoja KBS, kao i komplikacija u pojedinim bolestima srca. Prema literaturi spominje ih se više od 100. Jedan od prvih izračuna za procjenu rizika KBS je Framinghamski risk score, nastao na temelju studije u gradu Framinghamu u Massachusettsu. Rizik razvoja KBS kroz 10 godina se izračunava na temelju godina, muškog spola, pušenja, prisustva dijabetesa, hipertrofije lijeve klijetke, arterijskog tlaka te vrijednosti ukupnog kolesterola i HDL<sup>28</sup>. Kao odgovor na taj iz-

consequence of indirect factors arising from the socioeconomic status. Lower socioeconomic status is usually associated with poorer preventive medicine, poorer diet and daily stressogenic existential problems, which can lead to psychological problems from depression to anxiety. Psychosocial and socioeconomic factors are interwoven, mutually influence each other and are usually mutually potentiated. Some studies have showed a clear connection between the socioeconomic status and an increased mortality and morbidity. The studies have found that persons with lower socioeconomic status more often smoke, are obese, physically inactive, are more often alcoholics and have high levels of cholesterol and triglycerides in the blood<sup>14,15</sup>.

Over time, the level of education has become an increasingly common marker of socioeconomic status. Most of the trials show an inverse association of education level, risk factors for the development of CHD and the development of CHD<sup>16</sup>. Women with lower level of education are more commonly smokers in Finland, the Netherlands, Norway, Germany, England, Sweden and Switzerland, and less in Spain, Portugal, and after they turn 45 years of age in France and Italy<sup>17</sup>. In Croatia, men and woman with a higher level of education engage in physical activities more frequently, but they take larger amounts of alcohol and smoke more commonly<sup>6</sup>.

Acute emotional and physical stress can lead to an increase in sympathetic activity which may cause rupture of vulnerable plaque and coronary artery occlusion. Higher sympathetic tonus causes vasoconstriction especially of atherosclerotic coronary artery which leads to the development of myocardial ischemia<sup>18,19</sup>. Acute stress due to a loss of a close relative or a physical attack is a documented CHD risk factor in several studies, largely as a consequence of the development of endothelial dysfunction, while the chronic stressogenic effect has been still insufficiently explored, but it is probably associated with a high level of cortisol in the blood, abdominal obesity, hyperlipoproteinemia and endothelial dysfunction<sup>20,21</sup>. Acute emotional stress is more often associated with the development of acute myocardial infarction in women than in men<sup>22</sup>. Gender differences in autonomic innervation, regulation of the myocardium and left ventricular response to ischemia have not yet been sufficiently explored<sup>23</sup>.

Stress-induced atherosclerotic changes in coronary arteries have been demonstrated in animal models<sup>24</sup>. Prospective studies have shown that stress at work is associated with an increased risk of morbidity and mortality from CHD, regardless of smoking and other risk factors<sup>25</sup>. Stress at work as a potential CHD risk factor is present in 12.2% of patients; 15% of men in continental Croatia is exposed to stress at work in the form of failure or loss of a job, while in the Mediterranean Croatia such stress is present in 8.7% of patients<sup>6</sup>. Anxiolytics combined with beta-blockers can reduce myocardium vulnerability<sup>22</sup>.

The measurement of the life quality describes their own perception of the health status and it should be considered along with traditional assessment of physical and psychological status and investigations<sup>26,27</sup>. Based on the SF-36 questionnaire in Croatia, the physical status was worse than psychological status in patients with CHD compared to the general population. Women also had poorer own understanding of health compared to men in all variables<sup>6</sup>.

Since there are many potential factors for the development of CHD, there are many calculation predictors for a potential risk of developing CHD and complications of specific heart diseases. According to the literature, there are more than 100 of them. One of the first calculations for the CHD risk

račun, a u svijetlu novijih socioekonomskih čimbenika rizika, razvili su se škotski i engleski modeli izračuna rizika razvoja kardiovaskularne bolesti. ASSIGN score nastao je 2006. god. u Škotskoj te uz klasične čimbenike rizika dob, spol, obiteljska anamneza, dijabetes, arterijski tlak i kolesterol uzima u izračun i okolinu kao jedan od rizika KBS<sup>28-30</sup>. Slično tome koristi se i Qrisk score<sup>2</sup>, naknadno objavljen u Engleskoj. U njegovom izračunu se koristi Townsendov indeks deprivacije s podacima o kućanstvima bez auta, prebučnim ili neugodnim susjedstvom, podstanarstvu te nezaposlenosti. Osim navedenog u varijabli se koristi i dob, spol, pušenje, dijabetes, obiteljska anamneza KBS, fibrilacija atrijske, arterijski tlak, kolesterol te indeks tjelesne mase. Rizik razvoja KBS se može izračunati u razdoblju od preko dvije do više od 10 godina<sup>29-31</sup>.

U izračunima rizika može se koristiti i upitnik SF-36 koji na temelju 36 pitanja procjenjuje psihosocijalni status kao mogući čimbenik rizika KBS. Osim standardne skale koja procjenjuje status unutar 4 tjedna u novije vrijeme se koristi i tzv. akutna verzija koja daje preciznije podatke o promjenama psihosocijalnog stanja koji mogu utjecati na razvoj KBS<sup>26,27</sup>.

Zaključno, postoji čitav niz tzv. rizičnih čimbenika koji se dovode u vezu s razvojem KBS, a s tim u vezi i veliki broj varijabli i matematičkih izračuna kojima se nastoji predvidjeti razvoj KBS pa tako i utjecati na njezinu prevenciju. Rezultati govore da smo sve uspješniji u tome, ali na žalost još uvijek nedovoljno uspješni.

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assessment is the Framingham risk score, designed on the basis of studies in the town of Framingham in Massachusetts. The risk of developing CHD over 10 years' time is calculated on the basis of age, male gender, smoking, presence of diabetes, left ventricular hypertrophy, blood pressure and total cholesterol value as well as the HDL value<sup>28</sup>. Scottish and English models of calculating the risk of development of cardiovascular diseases have been created in response to this score and in the light of recent socio-economic risk factors. ASSIGN score was created in 2006 in Scotland and along with traditional risk factors such as age, gender, family history, diabetes, blood pressure and cholesterol, it also includes the environment in the score as one of the CHD risks<sup>28-30</sup>. The Qrisk score<sup>2</sup> is similarly used which was later published in England. Its score uses the Townsend's deprivation index with the data on households without a car, overcrowded households, households not owner-occupied and persons unemployed. Except as provided in the variable, the age, sex, smoking, diabetes, family history for CHD, atrial fibrillation, blood pressure, cholesterol and body mass index are applied. The risk of developing CHD can be calculated during a period of two to over 10 years' time<sup>29-31</sup>.

The risk score can also include the SF-36 questionnaire, which on the basis of 36 questions assesses psychosocial status as a potential CHD risk factor. In addition to a standard scale that evaluates the status within 4 weeks, the so-called acute version providing more precise information on changes in psychosocial condition that may influence the development of CHD has been recently used<sup>26,27</sup>.

To conclude, there are many so-called risk factors that are associated with the development of CHD, and in that respect there are many variables and mathematical calculations which are used to try to predict the development of CHD and thus affect its prevention. The results show that we are more successful at it, but unfortunately still not successful enough.

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