

Periferna arterijska bolest donjih ekstremiteta — osvrt na smjernice Europskog kardiološkog društva

Peripheral artery disease of lower extremities — review of the European Society of Cardiology guidelines

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SAŽETAK: Periferna arterijska bolest (PAB) donjih ekstremiteta prepoznata je kao ozbiljan kardiovaskularni poremećaj. Simptomatska i asimptomatska PAB prediktor je infarkta miokarda, moždanog udara i kardiovaskularnog mortaliteta. Godine 2011. objavljene su prve smjernice Europskog kardiološkog društva o dijagnostici i liječenju PAB. Smjernice obuhvaćaju aterosklerotsku bolest svih nekoronarnih vaskularnih područja, a značajan dio smjernica posvećen je upravo okluzivnoj bolesti arterija donjih ekstremiteta.

Osnovni dijagnostički test jest mjerenje omjera sistoličkog tlaka na gležnju i ruci (engl. *ankle-brachial index*, ABI), koji osim potvrde dijagnoze ukazuje i na težinu bolesti. Vrijednosti ABI <0,9 su patološke, dok ABI <0,5 nosi visok rizik od amputacije. Kombinacija ABI i dupleks ultrazvuka dovoljna je za donošenje optimalne odluke o načinu liječenja većine bolesnika. Digitalna subtrakcijska angiografija danas se primjenjuje uglavnom samo kada je planirana endovaskularna intervencija.

Opće preporuke u liječenju PAB podrazumjevaju prestanak pušenja, poticanje svakodnevne tjelesne aktivnosti, redukciju prekomjerne tjelesne težine te favoriziranje mediteranske prehrane. Antihipertenzivi, statini i antitrombocitni lijekovi okosnica su farmakoterapije. Bolesnici s intermitentnim klaudikacijama moraju biti upoznati s važnošću redovitih vježbi hodanja koje značajno produžavaju hodnu prugu. Revaskularizacija u asimptomatskih bolesnika se ne preporuča. U mnogim centrima danas se kao prva revaskularizacijska metoda preferira perkutana angioplastika (PTA), a kirurška revaskularizacija u slučaju neuspjeha PTA. Pokušaj revaskularizacije obavezan je kod kritične ishemije. Revaskularizacija je opravdana kod aortoilijačne bolesti te u svih bolesnika koji unatoč tromjesečnoj konzervativnoj terapiji i dalje imaju klaudikacije koje im značajno narušavaju kvalitetu života.

Liječenje bolesnika s PAB često zahtijeva multidisciplinarni pristup. Primjena smjernica u svakodnevnoj praksi pruža dodatnu sigurnost u odluci o optimalnom načinu liječenja svakog pojedinog bolesnika.

KLJUČNE RIJEČI: periferna arterijska bolest, smjernice.

SUMMARY: Peripheral artery disease (PAD) of the lower extremities has been recognized as a serious cardiovascular disorder. Symptomatic and asymptomatic PAD is a predictor of myocardial infarction, stroke and cardiovascular mortality. In 2011, the first European Society of Cardiology guidelines on PAD diagnostics and treatment were published. The guidelines include atherosclerotic disease of all non-coronary vascular areas, and a great part of the guidelines covers occlusive artery disease of lower extremities.

The main diagnostic test is the ankle-brachial index measurement (ABI), which in addition to confirmation of the diagnosis indicates the severity of the disease. ABI values <0.9 are pathological, while ABI <0.5 carries a high risk of amputation. The combination of ABI and duplex ultrasound is sufficient for making an optimal treatment decision for most of the patients. Digital subtraction angiography is today used mainly when the endovascular intervention is planned.

General recommendations for treatment of PAD include giving up smoking, encouraging daily physical activity, overweight reduction and opting for Mediterranean diet. Antihypertensive drugs, statins and antiplatelet drugs are the basic drugs in pharmacotherapy. Patients with intermittent claudications must be familiar with the importance of regular walking exercises that significantly prolong the walking distance. Revascularization in asymptomatic patients is not recommended. In many centers today, percutaneous transluminal angioplasty (PTA) is preferred as the first revascularization method, while the surgical revascularization is preferred in case of failure of PTA. The attempt of revascularization is mandatory in the event of critical ischemia. Revascularization is justified in case of aortoiliac disease and in all patients that despite a three-month conservative therapy still have claudications which severely impair their quality of life.

Treatment of patients with PAD often requires a multidisciplinary approach. Application of guidelines in daily practice provides additional safety in making the decision on optimal method of treatment for each patient.

KEYWORDS: peripheral artery disease, guidelines.

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Uvod

Na kongresu Europskog kardiološkog društva (ESC) 2011. godine predstavljene su prve smjernice ESC o dijagnostici i liječenju periferne arterijske bolesti (PAB)¹. Kako se u svakodnevnoj praksi susrećemo s brojnim bolesnicima koji imaju različite oblike PAB, smjernice su dočekane s velikim zanimanjem. Razlog za njihov nastanak sve je veći broj kardioloških bolesnika s vaskularnim problemima drugih organa i organskih sustava koji često utječu na prognozu i strategiju liječenja. Fokus smjernica je na aterosklerotskim lezijama, dok su ostali uzroci PAB poput vaskulitisa spomenuti, ali nisu detaljnije analizirani. U smjernice su uključena sva vaskularna područja osim koronarnih arterija i aorte. Uz opće preporuke o dijagnostici i liječenju aterosklerotske PAB, smjernice obrađuju sljedeća vaskularna područja: ekstrakranijsku bolest karotidnih i vertebralnih arterija, bolest arterija gornjih ekstremiteta, mezenterijalnih arterija, renalnih arterija, arterija donjih ekstremiteta te polivaskularnu arterijsku bolest. Obzirom na opsežnost, ovaj pregledni članak smo ograničili na aterosklerotsku problematiku donjih ekstremiteta.

Epidemiologija i važnost periferne arterijske bolesti donjih ekstremiteta

Bolest najčešće počinje u dobi od 40 godina uz progresiju s porastom životne dobi. U populaciji starijih od 65 godina prevalencija PAB je oko 20%. Poznati čimbenici rizika za nastanak PAB su životna dob iznad 50 godina, dislipidemija, arterijska hipertenzija te nadasve šećerna bolest i nikotinizam. Trećina bolesnika ima tipične simptome, najčešće intermitentne klaudikacije. Prevalencija kritične ishemije u starijih od 60 godina značajno je manja (0,4%)²⁻⁴. Potrebno je naglasiti da anatomski identična bolest često ima varijabilnu kliničku sliku. Brojni bolesnici nemaju simptoma, kod njih se PAB dijagnosticira temeljem odsutnih ili oslabljenih pulsacija odnosno mjerenjem omjera sistoličkog tlaka na gležnju i ruci (ABI, engl. *ankle-brachial index*). Sa stajališta oboljelog, tj. ishemičnog ekstremiteta, kod većine bolesnika prognoza je dobra, 70-80% bolesnika imaju stabilne klaudikacije kroz razdoblje od 10 godina⁵. Nasuprot tome, zabrinjavajući su podaci o značajno povećanoj učestalosti infarkta miokarda, moždanog udara i kardiovaskularnog mortaliteta u asimptomatskih i simptomatskih bolesnika s PAB. Smatra se da oko 60% bolesnika s intermitentnim klaudikacijama ima značajnu koronarnu i/ili karotidnu bolest^{6,7}. U razdoblju od 10 godina bolesnici s PAB donjih ekstremiteta imaju 6 puta veći mortalitet nego osobe bez PAB⁸. Osim vrijednosti ABI, novija istraživanja pokazuju da su i ostali lokalni pokazatelji ateroskleroze perifernih arterija, poput ehogenosti plaka ili debljine intima medija femoralne arterije, korisni parametri u procjeni kardiovaskularnog rizika^{9,10}. Značenje PAB nadilazi oboljeli ekstremitet, potrebno je sagledati kardiovaskularni sustav kao cjelinu u kojem PAB ima i prognostičku važnost. Usprkos tome, opći je konsenzus o postojanju zanemarenosti bolesnika s perifernom vaskularnom bolešću kako u prepoznavanju bolesti, tako i u liječenju onih kod kojih je bolest već dijagnosticirana.¹¹⁻¹³

Dijagnostički pristup

Anamneza i fizikalni status temelj su vaskularne evaluacije. Dijagnostičke metode kod PAB donjih ekstremiteta su mjerenje ABI, mjerenje segmentalnih tlakova, pletizmografija,

Introduction

At the 2011 Congress of the European Society of Cardiology (ESC), the first ESC Guidelines on diagnostics and treatment of peripheral artery disease (PAD)¹ were presented. Since we face numerous patients suffering from various types of PAD in our daily practice, a great interest has been shown for the guidelines. The reason for their occurrence is an increasing number of cardiac patients with vascular problems affecting other organs and organ systems that often influence prognosis and treatment strategy. The guidelines are focused on atherosclerotic lesions, while other PAD causes, such as vasculitis have been mentioned, but not analyzed in details. The guidelines include all vascular areas except for coronary arteries and aorta. In addition to general recommendations on diagnostics and treatment of atherosclerotic PAD, the guidelines cover the following areas: extracranial carotid and vertebral artery disease, upper extremity artery disease, mesenteric artery disease, renal artery disease, lower extremity artery and polyvascular artery disease. Considering the complexity, we have limited this review article to the atherosclerotic problem of lower extremities.

Epidemiology and importance of peripheral artery disease of lower extremities

The disease usually occurs at the age of 40 which progresses with increasing age. In the population over 65, the prevalence of PAD is approximately 20%. The well-known risk factors for occurrence of PAD are age over 50, dyslipidemia, hypertension, and diabetes and tobacco smoking above all. One third of patients have typical symptoms, mostly intermittent claudications. The prevalence of critical ischemia in patients over 60 is significantly lower (0.4%)²⁻⁴. It should be emphasized that anatomically identical disease often has a variable clinical picture. Many patients have no symptoms when they are PAD diagnosed on the basis of missing or weak pulsations or by measurement of ankle-brachial index (ABI). From the standpoint of a diseased person, that is, ischemic limb, in most patients the prognosis is good, 70-80% of patients have stable claudications throughout a period of 10 years⁵. On the other hand, the data on significantly increased incidence of myocardial infarction, stroke and cardiovascular mortality in asymptomatic and symptomatic patients with PAD are disturbing. About 60% of patients with intermittent claudications are believed to have significant coronary and/or carotid disease^{6,7}. During the 10 years' period, patients with PAD of lower extremities show six times higher mortality than those not suffering from PAD⁸. Besides the ABI values, some recent trials show that other local indicators of atherosclerosis of peripheral arteries, such as plaque echogenicity or intima-media thickness of the femoral artery are also some useful parameters in assessing cardiovascular risk^{9,10}. The PAD meaning surpasses a suffering limb, so it is necessary to examine the cardiovascular system as a whole, in which PAD has a prognostic significance. Nevertheless, we have general consensus on the existence of neglected patients with peripheral vascular disease not only with regard to recognition of the disease, but also the treatment of those in whom the disease has already been diagnosed.¹¹⁻¹³

Diagnostic approach

The history and physical examination are the basis of vascular evaluation. Diagnostic methods in PAD of lower extremities

dupleks ultrazvuk (DUS), CT angiografija, MR angiografija i digitalna subtrakcijska angiografija (DSA).

ABI je neizostavna metoda u dijagnostici i procjeni težine PAB donjih ekstremiteta. U zdravih osoba ABI je $>1,0$. Osjetljivost patološkog ABI ($<0,90$) u detekciji angiografski vidljive PAB je 95%, a specifičnost 99%¹⁴.

U bolesnika s graničnim ABI u mirovanju i simptomima koji ukazuju na moguću PAB, korisno je napraviti test opterećenja na pokretnoj traci. Pad vrijednosti ABI za 20% nakon opterećenja potvrđuje je PAB.

Određeni broj bolesnika ima vrlo visoke vrijednosti ABI ($>1,4$). Radi se najčešće o bolesnicima visoke životne dobi, s dijabetesom ili kroničnim bubrežnim zatajenjem koji imaju kalcificirane, nekompresibilne arterije. Tada nam je u dijagnosticiranju PAB korisna pletizmografija, analiza morfologije doplerskog spektra i mjerenje indeksa tlaka nožnog palca (TBI, engl. *toe-brachial index*). Vrijednost TBI $<0,7$ je patološka.

U komparaciji s DSA, osjetljivost DUS u detekciji signifikantnih stenoza je 85-90%, dok je specifičnost $>95\%$ ¹⁵. Lezije se verificiraju pomoću dvodimenzionalnog prikaza i obojanog doplera, dok se stupanj stenozе procjenjuje temeljem analize doplerskog spektra i maksimalnih brzina protoka. Kao glavni nedostatak DUS u komparaciji s ostalim slikovnim metodama (DSA, CTA, MRA) navodi se nemogućnost integriranog prikaza cijelog arterijskog stabla. Pomoću ABI i DUS potvrđuje se dijagnoza, prikazuje se lokalizacija i morfologija lezije te procjenjuje težina ishemije. Važno je znati da je za donošenje optimalne odluke o strategiji liječenja, u većine bolesnika dovoljno napraviti ABI i DUS.

Ukoliko se planira revaskularizacija, CT i MR angiografijom mogu se dobiti dodatne anatomske informacije. Nekadašnji zlatni standard — DSA danas se uglavnom koristi samo kod planiranih endovaskularnih intervencija.

Terapija periferne arterijske bolesti

Opće preporuke

Svi bolesnici s PAB imaju povećan rizik za nastanak kardiovaskularnih komplikacija. Kako bi se poboljšala prognoza oboljelih nužne su mjere sekundarne prevencije. Opće terapijske preporuke u bolesnika s PAB podrazumjevaju prestanak pušenja, regulaciju arterijskog tlaka, adekvatnu kontrolu glikemije i hiperlipidemije s ciljnim vrijednostima LDL kolesterola $<2,5$ mmol/L, optimalno $<1,8$ mmol/L.

Konzervativna terapija

Osim sekundarne prevencije cilj liječenja u bolesnika s intermitentnim klaukacijama je i olakšavanje simptoma, odnosno produženje hodne pruge. Vježbe hodanja uz farmakoterapiju neizostavan su dio konzervativnog liječenja (Slika 3, na str. 2883.; Tendera M et al, Eur Heart J. 2011;32:2851-906.). Dokazano je da kontrolirani program treninga može produžiti hodnu prugu za prosječno 150 metara¹⁶. Kako bi bili motivirani i uporni u redovitim šetnjama bolesnicima je potrebno objasniti da su vježbe hodanja oblik liječenja, podjednako važan kao i lijekovi.

Dokazi o djelotvornosti farmakoterapije u PAB donjih ekstremiteta generalno su nedostadni, mehanizmi djelovanja često nejasni, a učinkovitost na hodnu prugu mala do umjerna. Najviše dokaza o učinkovitosti ima cilostazol, inhibitor fosfodiesteraze 3, koji produžava hodnu prugu za oko 70 metara¹⁷. Prema meta-analizi koje je uključivala 788 bolesni-

ties are ABI measurement, segmental pressure measurement, plethysmography, duplex ultrasound (DUS), CT angiography, MR angiography and digital subtraction angiography (DSA).

ABI is an unavoidable method in diagnostics and assessment of severity of PAD of lower extremities. In healthy persons, ABI is >1.0 . Sensitivity of pathological ABI (<0.90) in detection of angiographically visible PAD is 95% and specificity is 99%¹⁴.

In patients with borderline ABI at rest and symptoms indicating potential PAD, it is useful to make a treadmill stress test. A decline in the ABI value by 20% after stress confirms PAD.

A certain number of patients have very high ABI values (>1.4). These are usually very elderly patients suffering from diabetes or chronic kidney disease who have calcified, incompressible arteries. In that case, when making a diagnosis of PAD, plethysmography, analysis of Doppler spectrum morphology and toe-brachial index measurement (TBI) are useful. TBI value <0.7 is pathological.

In comparison to DSA, the sensitivity of DUS in detection of significant stenosis is 85-90%, while the specificity is $>95\%$ ¹⁵. Lesions are verified by using 2-D view and color Doppler, while the degree of stenosis is assessed by analyzing Doppler spectrum and the maximum flow rates. A major disadvantage of DUS in comparison with other imaging methods (DSA, CTA, MRA) is a lack of possibility of an integrated view of the entire arterial tree. By using ABI and DUS we confirm the diagnosis, the localization and lesion morphology is shown and the ischemia severity is assessed. It is important to know that it is sufficient to make ABI and DUS for making optimal decision on treatment strategy in most of the patients.

If revascularization is planned, additional anatomical information can be obtained by applying CT and MR angiography. The former gold standard — DSA is today mainly used only for planned endovascular interventions.

Peripheral artery disease treatment

General recommendations

All patients with PAD have increased risk of occurrence of cardiovascular complications. In order to improve the prognosis of diseased patients, secondary prevention measures are required. General therapeutic recommendations in patients with PAD include giving up smoking, blood pressure regulation, adequate glycaemic control and hyperlipidemia control with target LDL cholesterol <2.5 mmol/L values, the optimal <1.8 mmol/L.

Conservative therapy

In addition to the secondary prevention, the aim of the treatment in patients with intermittent claudications is also relieving the symptoms, or prolongation of the walking distance. Walking exercises along with pharmacotherapy are an indispensable part of conservative treatment (Figure 3, page 2883.; Tendera M et al, Eur Heart J. 2011;32:2851-906.). It has been proven that the controlled training program can prolong the walking distance by average 150 meters¹⁶. In order to be motivated and persistent in regular walks, the patients need to be explained that walking exercises are a form of the treatment that are as important as medicines.

Evidence on the efficacy of pharmacotherapy in PAD of lower extremities is generally insufficient, the mechanisms of

ka zabilježeno je da primjena pentoksifilina signifikantno produžava hodnu prugu (+59 metara)¹⁸.

Povoljan učinak ACE inhibitora na dužinu hodne pruge nije dokazan, također nema dokaza o negativnom utjecaju beta-blokatora na PAB^{19,20}. Zanimljivo je da nekoliko studija ističe pozitivne efekte statina na produženje hodne pruge¹⁸.

Endovaskularno liječenje

Mnogim bolesnicima danas možemo ponuditi endovaskularni zahvat kao manje invazivnu metodu revaskularizacije donjih ekstremiteta. Činjenica je da sve više ustanova preferira endovaskularno liječenje kao prvu opciju, iako nema dovoljno studija koje kompariraju uspješnost endovaskularne i kirurške revaskularizacije; pogotovo dugotrajnu prohodnosti revaskulariziranih segmenata. Također, nema dokaza o dugotrajnoj prednosti endovaskularnog liječenja naspram konzervativnog liječenja u bolesnika s blagim do umjerenim klaudikacijama. Anatomske karakteristike PAB, komorbiditet, vještina i iskustvo operatera važne su u odabiru najprikladnije revaskularizacijske strategije. Dok je pokušaj revaskularizacije obavezan u bolesnika s kritičnom ishemijom, važno je naglasiti da "profilaktička" revaskularizacija u asimptomatskih bolesnika nije indicirana. Osim kod kritične ishemije, revaskularizacija je opravdana u bolesnika s intermitentnim klaudikacijama koje narušavaju kvalitetu života uz neuspjeh konzervativnog liječenja te kod aortoilijskih lezija neovisno o odgovoru na konzervativno liječenje. Preporuke o endovaskularnoj ili kirurškoj revaskularizaciji ovise o lokalizaciji i morfologiji lezija koje su prema TASC II klasifikaciji podjeljene u četiri kategorije²¹.

Kao prva revaskularizacijska opcija u obstruktivne aterosklerotičke bolesti distalne aorte i ilijačnih arterija (TASC II A-C) preporuča se endovaskularna metoda. U centrima koji imaju veliko iskustvo u endovaskularnim procedurama i najkompleksnije aortoilijske lezije (TASC D) mogu se tretirati perkutano. Femoropoplitealni segment karakterizira visoka prevalencija difuzne bolesti, kao i deformacije površinske femoralne arterije u različitim smjerovima uslijed mišićnih kontrakcija. Razvojem tehnologije te usavršavanjem operatera i u ovom segmentu za većinu lezija PTA je prvi izbor revaskularizacije (TASC II A-C). Infrapoplitealni segment najdelikatnija je regija za revaskularizaciju. Poznata je loša dugoročna prohodnost te se pokušaj endovaskularne intervencije savjetuje kod kritične ishemije. Infrapoplitealna angioplastika u bolesnika s intermitentnim klaudikacijama uglavnom nije indicirana.

U svih bolesnika nakon angioplastike preporuča se antiagregacijska terapija acetilsalicilnom kiselinom (ASK) radi smanjenja rizika sistemskih vaskularnih događaja. Nakon infraingvinalne ugradnje BMS preporučeno trajanje dvojnog antiagregacijske terapije je barem mjesec dana.

Kirurško liječenje

Jedina prospektivna, randomizirana studija koja uspoređuje uspjeh angioplastike i kirurških premosnica kod infraingvinalne bolesti je studija BASIL. Učestalost neamputiranih bolesnika u obje skupine nakon godinu dana (71% / 68%) i nakon tri godine (52% / 57%) bile su gotovo jednake²². Prema aktualnim smjernicama, nakon infraingvinalnih premosnica preporuča se primjena ASK ili kombinacije ASK i dipiridamola, dok se antagonisti vitamina K mogu primijeniti nakon premoštenja autolognom venom. Nakon distalnih

its action are often unclear, and the efficacy on the walking distance is low to moderate. Cilostazol, phosphodiesterase inhibitor 3, which prolongs the walking distance by about 70 meters, has provided the most evidence on the efficacy¹⁷. According to a meta-analysis that included 788 patients, it was recorded that the use of pentoxifylline significantly prolongs the walking distance (+59 m)¹⁸.

The favorable effect of ACE inhibitors on the length of the walking distance has not been proven, there is also no evidence of the negative impact of beta-blockers on PAD^{19,20}. Interestingly, several studies highlight positive effects of statins on the prolongation of the walking distance¹⁸.

Endovascular treatment

Today we can offer many patients endovascular surgery as a minimally invasive method of revascularization of the lower extremities. The fact is that more and more institutions prefer endovascular treatment as the first option, although there are not enough studies comparing success of endovascular and surgical revascularization, especially long-term patency of revascularized segments. There is also no evidence of long-term benefits of endovascular treatment compared to conservative treatment in patients with mild to moderate claudications. Anatomical characteristics of PAD, comorbidity, skills, and surgeon's experience are important in selecting the most appropriate revascularization strategy. While the attempt of revascularization is mandatory in patients with critical ischemia, it is important to emphasize that "prophylactic" revascularization in asymptomatic patients is not indicated. Except for critical ischemia, revascularization is a reasonable method for patients with intermittent claudications that impair the quality of life followed by the failure of conservative treatment and in case of aortoiliac lesions irrespective of the response to conservative treatment.

Recommendations on endovascular or surgical revascularization depend on the localization and morphology of lesions that according to the TASC II classification are divided into four categories²¹.

Endovascular method is recommended as the first revascularization option in obstructive atherosclerotic disease of the distal aorta and iliac arteries (TASC II AC). In centers that have extensive experience in endovascular surgeries, even the most complex aortoiliac lesions (TASC D) can be treated percutaneously. Femoropopliteal segment is characterized by a high prevalence of diffuse disease and deformation of the superficial femoral arteries in different directions due to muscle contractions. Owing to the development of technology and training that surgeons receive, PTA is the first choice of revascularization (TASC II AC) even in this segment for the majority of lesions. Infrapopliteal segment is the most delicate region for revascularization. Poor long-term patency is well known, so an attempt to perform endovascular surgery in case of critical limb ischemia is advised. Infrapopliteal angioplasty in patients with intermittent claudications is mainly not indicated.

In all patients following angioplasty, we recommend antiplatelet aspirin therapy to reduce the risk of systemic vascular events. Following infrainguinal implantation of the BMS, the recommended duration of dual antiplatelet therapy is at least one month.

Surgical treatment

The only prospective, randomized study comparing the success of angioplasty and surgical bypass in infrainguinal diseases is the BASIL study. The frequency of non-amputat-

prostetičkih potkoljeničnih premoštenja dolazi u obzir primjena dvojne antiagregacijske terapije.

Osim premosnica ponekad je indicirana lokalna endarterektomija, dok je amputacija zadnje rješenje u slučaju ireverzibilne ishemije. Sekundarnu amputaciju treba napraviti u slučaju neuspjele revaskularizacije, kada reintervencija nije moguća ili u slučaju daljnjih komplikacija uslijed infekcije i nekroze usprkos prohodne premosnice. Primjena lumbalne simpatektomije je kontroverzna i danas gotovo napuštena u praksi.

Terapijske smjernice kod kritične ishemije

Kritična ishemija najteži je oblik kliničke manifestacije PAB donjih ekstremiteta i podrazumijeva bolove u mirovanju, ishemijski ulkus ili gangrenu. Preporučeni dijagnostički kriterij za kritičnu ishemiju je vrijednost sistoličkog tlaka na gležnju >50 mmHg. Liječenje zahtijeva multidisciplinarni pristup, kontrolu faktora rizika ateroskleroze, revaskularizaciju, liječenje infekcije i rehabilitacijski program (Slika 4, na str. 2886.; Tendera M et al, Eur Heart J. 2011;32:2851-906.).

Terapijske smjernice kod akutne ishemije ekstremiteta

U podlozi akutno nastale hipoperfuzije ekstremiteta najčešće je embolija ili tromboza u području preegzistentnih aterosklerotskih lezija. Nužna je brza procjena vijabilnosti ekstremiteta te što ranija primjena nefrakcioniranog heparina (Slika 5, na str. 2888.; Tendera M et al, Eur Heart J. 2011; 32:2851-906.). Sljedeći terapijski korak ovisi o tipu okluzije (tromboza ili embolija), lokalizaciji, trajanju ishemije, stupnju ugroženosti ekstremiteta i komorbiditetima. U bolesnika koji imaju motorički i/ili teški senzorni deficit indicirana je urgentna kirurška revaskularizacija. Ukoliko simptomi traju kraće od 14 dana, a ekstremitet je vijabilan uz eventualni minimalni gubitak osjeta razmatra se primjena selektivne intraarterijske trombolize. Sistemska tromboliza nije indicirana.

Kliničko praćenje bolesnika

Mjerenje ABI uvelike olakšava praćenje većine bolesnika. Promjene vrijednosti ABI za 0,15 smatraju se značajnim u slučaju progresije bolesti²³. Redovite kontrole revaskulariziranih ekstremiteta omogućavaju pravovremenu reintervenciju i mogu doprinijeti dugoročnoj prohodnosti premosnica. Osim preporuke za reevaluaciju bolesnika s intermitentnim klaukacijama nakon tromjesečnog inicijalnog programa konzervativnog liječenja, u smjernicama nema uputa o optimalnim vremenskim intervalima između redovitih kontrola.

Većina centara u kontroli bolesnika nakon PTA ili kirurške revaskularizacije kombinira ABI i DUS. Nakon uspješne PTA obično se bolesnik kontrolira za 1, 3, 6, 12 mjeseci, a nakon godine dana razdoblje praćenja se može produžiti na 6-12 mjeseci.

U praksi su uvriježene periodičke kontrole kirurških premosnica DUS mjesec dana poslije operacije te svaka tri mjeseca u prvoj postoperativnoj godini. Nakon ovog razdoblja kontrolni pregledi obavljaju se svakih 6-12 mjeseci²⁴. Međutim, multicentrično randomizirano istraživanje koje je uključivalo 594 bolesnika s venskim premosnicama nije dokazalo superiornost sistematskih kontrola dupleks ultrazvukom naspram kliničkog praćenja²⁵.

ed patients in both groups after one year (71% / 68%) and after three years (52% / 57%) was almost the same²². According to current guidelines, after infrainguinal bypass grafts, we recommend the application of aspirin or a combination of ASK and dipyridamole, while the vitamin K antagonists can be applied after autologous vein bypass graft. The use of dual antiplatelet therapy is considered following the distal below-knee bypass prosthesis.

Except for bypass, local endarterectomy is sometimes indicated, while the amputation is the last solution in case of irreversible ischemia. Secondary amputation needs to be performed in case of failed revascularization, when reintervention is not possible or in case of further complications that occur as a consequence of infections and necrosis despite bypass graft patency. The application of lumbar sympathectomy is controversial and today it is almost abandoned in practice.

Treatment guidelines for critical limb ischemia

Critical ischemia is the most serious form of clinical manifestations of PAD of the lower extremities and involves pain at rest, ischemic ulcer or gangrene. The recommended diagnostic criteria for critical ischemia is the ankle systolic pressure >50 mmHg. The treatment requires a multidisciplinary approach, atherosclerotic risk factor control, revascularization, treatment of infections and rehabilitation program (Figure 4, page 2886.; Tendera M et al, Eur Heart J. 2011; 32:2851-906.).

Treatment guidelines for acute limb ischemia

In the background of acutely developed limb hypoperfusion, the most frequent disease is embolism or thrombosis in the area of preexisting atherosclerotic lesions. A quick assessment of viability of the extremities and the early application of unfractionated heparin is required (Figure 5, page 2888.; Tendera M et al, Eur Heart J. 2011;32:2851-906.). The next therapeutic step depends on a type of occlusion (thrombosis or embolism), localization, duration of ischemia, degree of threat of extremities and comorbidities. In patients with motor and/or severe sensory deficit, an urgent surgical revascularization is indicated. If symptoms last less than 14 days, and the limb is viable with minimal potential loss of sensation, the application of selective intraarterial thrombolysis is considered. Systemic thrombolysis is not indicated.

Clinical follow-up of patients

ABI measurement greatly facilitates the follow-up of the majority of patients. Changes in ABI values by 0.15 are considered significant in case of progression of the disease²³. Regular check-ups of revascularized extremities allow timely reintervention and may contribute to long-term patency of bypass. In addition to the recommendations for the re-evaluation of patients with intermittent claudications after the initial three-month period of conservative treatment, the guidelines include no guidance about the optimal intervals between regular check-ups.

Most centers combine ABI and DUS in follow-up of patients after PTA or surgical revascularization. After successful PTA, the patient is usually followed up in 1, 3, 6 and 12 months, and after one year, the follow-up can be extended to 6-12 months.

Zaključak

Koronarna bolest srca je čest uzrok smrti, no moždani udar, bubrežno zatajenje i komplikacije uzrokovane ishemijskim oštećenjem ekstremiteta značajno doprinose nepovoljnoj prognozi kardiovaskularnog bolesnika. Premda je PAB donjih ekstremiteta prepoznata kao rizični čimbenik kardiovaskularnog morbiditeta i mortaliteta, poznato je da su oboljeli liječeni manje intenzivno nego bolesnici s koronarnom bolešću. Senzibiliziranjem šire zdravstvene zajednice, u čemu smjernice imaju veliku ulogu, nadamo se da će se prepoznavanje bolesnika i liječenje oboljelih od PAB poboljšati.

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In practice, periodic follow-ups of DUS surgical bypass are commonly performed one month after the surgery and every three months during the first postoperative year. After this period, the follow-ups are performed every 6-12 months²⁴. However, a multicenter randomized trial that included 594 patients with venous grafts has not proved the superiority of systematic duplex ultrasound follow-ups versus clinical follow-up²⁵.

Conclusion

Coronary heart disease is a common cause of death, but the stroke, kidney failure and complications caused by ischemic extremity damage significantly contribute to a negative prognosis of cardiovascular patients. Although PAD of the lower extremities has been recognized as a risk factor for cardiovascular morbidity and mortality, it is known that diseased patients are treated less intensively than patients with coronary artery disease. Sensitizing the wider health community, whereas the guidelines have an important role, we hope that the identification of patients and treatment of the patients suffering from PAD will improve.

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