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XULOSA

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Ushbu maqolada surunkali buyrak kasalligi bo‘lgan bemorlarda uremik miopatiya muammolari muhokama qilinadi.

Kalit so‘zlar: surunkali buyrak kasalligi, gemodializ.

SUMMARY

UREMIC MYOPATHY IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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This article discusses the issues of uremic myopathy in patients with chronic kidney disease.

Key words: chronic kidney disease, hemodialysis.

РЕЗЮМЕ

УРЕМИЧЕСКАЯ МИОПАТИЯ У БОЛЬНЫХ ХРОНИЧЕСКОЙ БОЛЕЗНЬЮ ПОЧЕК

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В данной статье рассмотрены вопросы уремической миопатии у больных с хронической болезню почек.

Ключевые слова: хроническая болезнь почек, гемодиализ.

Surunkali buyrak kasalligi (SBK) bilan og’rigan bemorlarda, ayniqsa gemodializda bo‘lganlarda, ko‘pincha mushaklarning sezilarli zaifligi va chidamliligi yo‘q. Bu ko‘pincha harakatsiz turmush tarziga olib keladi, bu kasallikning kuchayishiga olib keladi va gemodializ bilan og’rigan bemorlarda kasallanish va o‘limni oshiradi.

Jismoniy mashqlar kasallikning kuchayishiga ta‘sirini, kamaytirish ta‘sirini berishi mumkin, yoki yumshatishi va omon qolishni yaxshilashi mumkin.

Ushbu mavzuda uremik miyopatiyaning patofiziologiyasi va uning SBK va gemodializ bilan og’rigan bemorlarning harakatsiz turmush tarziga ta‘siri ko‘rib chiqiladi. Jismoniy mashqlarning foydali ta‘siri muhokama qilinadi va gemodializ bo‘lmagan SBK va gemodializ bemorlari uchun tavsiyalar beriladi.

Uremik miyopatiya SBK bilan og’rigan bemorlarda, ayniqsa gemodiyalizda bo‘lganlarda, jismoniy funksiyaning aniq pasayishini hisobga olgan holda keng tarqalgan hisoblanadi [1, 2]. Biroq, uremiya bilan bevosita bog’liq bo‘lgan o‘ziga xos patofiziologik jarayonning tarqalishi yaxshi aniqlanmagan, chunki simptomlar kichik va sekin rivojlanib boradi va aniq diagnostika mezonlari yo‘q [3]. 330 gemodializ bemorini o‘z ichiga olgan bir tadqiqotda sarkopeniya (funksiya/harakatchanlikning pasayishi bilan mushak massasining kamayishi) 20 foizda, faqat mushak massasining kamayishi 24 foizda va mushak kuchining pasayishi 15 foizda kuzatilgan [4].

Patofiziologiya. SBK bilan kasallangan bemorlarda sarkopeniya yoki atrofiya va zaiflikni keltirib chiqaradigan omillarga uremiya sabab bo‘lgan yallig’lanish va aktiv shakldagi kislorodning to‘planishi kiradi, bu esa mitoxondriyal ajralish va mushaklarni tiklash mexanizmlarining yetishmasligiga olib keladi [5–7]. Harakatsiz turmush tarziga SBK uchun xos bo‘lma-

gan, shuningdek, qandli diabet, noto‘g’ri ovqatlanish va periferik qon tomir kasalliklari kabi komorbid kasalliklar kabi mushaklarning buzilishida kuchayishida muhim rol o‘ynaydi. Eritropoetin, D vitamini va androgen yetishmovchiligi mushaklar kuchsizligiga sabab boladi.

Tadqiqotlar shuni ko‘rsatdiki, SBKda mitoxondriyal samaradorlik pasayadi, bu kislorod iste’moli birligiga adenozin trifosfat (ATP) ishlab chiqarishning pasayishi bilan tavsiflanadi (ya‘ni, mitoxondriyal ajralish) [8, 9]. Mitoxondriyal ajralish jismoniy mashqlar bardoshliligi va chidamliligining funksional pasayishidan oldin sodir bo‘lishi mumkin [10]. Mitoxondriyal ajralishning dastlabki sababi noma‘lum, ammo ko‘ptokchalar filtratsiya tezligi (KFT) pasayishi tufayli oksidlovchi stressning kuchayishi bilan bog’liq bo‘lishi mumkin [11].

Harakatsiz turmush tarzi. Harakatsiz turmush tarzi SBKda miyopatiyaga kuchayishiga asosiy hissa qo‘shadi. Harakatsiz turmush tarzi – bu harakatsizlik natijasida yuzaga keladigan mushak massasi (sarkopeniya), kuch va quvvatni yo‘qotishdir [12]. Manfredini F va hammualiflar uremik miyopatiyada harakatsiz turmush tarzining roli miyopatiya belgisi sifatida dam olish paytida mushaklarning kislorod iste’moli ($rmVO_2$) ishlatilgan tadqiqotda ko‘rsatildi [13]. «$rmVO_2$» ko‘rsatkichi SBK oxirgi bosqichda bilan og’rigan bemorlarda sog’lom odamlar bilan solishtirganda ikki baravar yuqori edi.

SBK bilan og’rigan bemorlar harakatsiz turmush tarziga – juda zaifdir. SBK bilan og’rigan bemorlar, sog’lom odamlarga qaraganda kamroq faol bo‘lishadi [14–16]. Faoliyat darajasining pasayishi sabablari to‘liq tushunilmagan, ammo mushaklarning erta charchoqlari (ehtimol, mitoxondriyal ajralish tufayli yuzaga kelgan), kamqonlik, ko‘plab kasalliklar va kasalxonaga yotqizish rol o‘ynashi mumkin.

Harakatsiz turmush tarzi qayta tiklanadi. Yuqorida keltirilgan tadqiqotda olti oylik jismoniy mashqlar SBK bilan og’rigan bemorlarning $rmVO_2$ ning pasayishiga olib keldi; 39 foizi esa normal $rmVO_2$ ga erishishdi [13].

Ko‘pgina tadqiqotlar shuni ko‘rsatdiki, jismoniy mashqlar SBK bilan og’rigan bemorlarning mushaklari faoliyatini va jismoniy faoliyatini yaxshilaydi [17–19].

Eritropoetin yetishmovchiligi. Eritropoetin yetishmovchiligi miopatiyaga o‘z hissini qo‘shishi mumkin, ammo bu aniq emas, chunki bu kamqonlik mushaklarga kislorod yetkazib berishning pasayishiga olib keladi va/yoki harakatsizlik va harakatsiz turmush tarziga hissisini qo‘shadi yoki eritropoetin mushaklarga bevosita ta‘sir qiladi.

Kamqonlikni eritropoetin bilan davolash SBK bilan og’rigan bemorlarda chidamlilik va kuchini yaxshilaydi [20]. Dastlabki tadqiqotda, eritropoetin bilan kamqonlikni 11 g/dL maqsadli gemoglobin darajasigacha davolash, 11 bemorda uch oy ichida qo‘l va oyoq mushaklarining kuchini 10–30 foizga oshirishga olib keldi, ammo bu yaxshilanish hali ham davom etmoqda. Bemorlarni sog’lom nazorat guruhiga qaraganda ancha kuchliroq qoldirdi [21].

Eritropoetin bilan davolash bilan mushaklarning tuzilishi yaxshilanadi. Bir tadqiqotda kamqonlikni davolashdan oldin va keyin o‘tkazilgan mushak biopsiyalari mushak tolalari diametrining yaxshilanishini va kamqonlik qisman davolanganidan so‘ng, mushak tolalarini anormalliklarning kamayishini ko‘rsatdi [22]. Ushbu o‘zgarishlar mushaklarning kuchi va ishlashining oshishiga olib keladi va, ehtimolki, mushaklarga kislorod yetkazib berishning ko‘payishi natijasidir.

Eritropoetin mushaklarga to‘g’ridan to‘g’ri ta‘sir qilishi mumkinligi (ya‘ni kamqonlik bilan bog’liq bo‘lmagan), uremiya bo‘lmagan bemorlarda (endogen eritropoetin darajasining pasayishi kutilmaydigan) qon quyish bilan kamqonlikni davolash mumkin emasligi bilan izohlanadi [23].

ANDROGEN YETISHMOVCHILIGI

Erkak va ayol SBK bilan og’rigan bemorlarda androgen ishlab chiqarish kamayadi.

Androgen yetishmovchiligi – mushaklarning buzilishiga yordam beradi. Rekombinant eritropoetin mavjud bo‘lgunga qadar, ba‘zi gemodializ bemorlarida kamqonlikni davolash uchun androgen terapiyasi qo‘llanilgan [24, 25] va bir tadqiqotda androgen, nandrolon dekanoat mushak massasini oshirishi qayd etilgan [25, 26]. Keyinchalik bu agent tana tarkibi va mushaklar kuchini yaxshilashi ko‘rsatildi [27, 28]. Bir tadqiqotda 79 bemor tasodifiy ravishda 2x2 faktorial tarzda anabolik steroidlarni qabul qilish va qarshilik mashqlarini o‘qitish uchun tayinlangan [28]. Nandrolon dekanoat tana massasini va mushaklar hajmini oshirardi.

D vitamini tanqisligi. d vitamini yetishmovchiligi turli sabablarga ko‘ra miyopatiyalar bilan bog’liq, shu jumladan statinlar va D vitaminiga bog’liq raxit [29–31]. Bir nechta hisobotlarda D vitaminining tegishli dozalari bilan qo‘shilishi mushaklarning faoliyatini yaxshilagan [29–31].

Ikkilamchi giperparatireoidizm. Birlamchi [32–35] va ikkilamchi giperparatireoz [36, 37] bo‘lgan bemorlarda miyopatiya haqida xabar berilgan. Birlamchi giperparatireoz bilan bog’liq bo‘lgan miopatiya paratireoid gormonining kamayishi bilan orqaga qaytishi ko‘rsatilgan [33, 35]. Biroq, ikkilamchi giperparatireoz haqida chop etilgan hisobotlarda paratireoid gormonining ta‘sirini D vitamini yetishmovchiligi va uremiya ta‘siridan ajratish qiyin [36, 37].

Karnitin tanqisligi. Ba‘zi tadqiqotlar shuni ko‘rsatdiki, L-karnitin qo‘shimchasi mushaklar kuchini yaxshilaydi, ammo chidamlilikni oshirmaydi [38, 39]. Biroq, mushaklarning metabolizmi va funksiyasi magnit-rezonans yoki yaqin infraqizil spektroskopiya bilan baholanganda, gemodializni olgan bemorlarda 16 hafta davomida L-karnitin qo‘shilishi hech qanday ta‘sir ko‘rsatmadi [40].

Gemodializga kirish. Gemodializga kirish mushaklar faoliyatiga mahalliy ta‘sir ko‘rsatishi mumkin. Bilakda arterio – venoz fistulaga kirish ta‘sirlangan qo‘lning katta va nozik motorli ko‘nikmalariga ta‘sir qilishi mumkin [41]. Gemodializga kirish yoki peritoneal dializ kateteri kirish yoki kateterga zarar yetkazishdan qo‘rqib, bemorning faolligini kamaytirishi mumkin. Garchi ko‘pincha kirish imkoniyati bo‘lgan bemorlarga cheklovlar

qo‘yilgan bo‘lsa-da (masalan, suzish va qorin bo‘shlig’i kateterlari bilan og’irliklarni ko‘tarish; terlash yoki gemodializ kateteri bilan suzish va boshqalar), bu tavsiyalar amaliyotda asoslanmagan.

Boshqa omillar. Ba‘zi bemorlarda o‘z hissini qo‘shishi mumkin bo‘lgan boshqa omillarga steroid miyopatiyasi, kaliy almashinuvining o‘zgarishi va to‘yib ovqatlanmaslik kiradi. Bu omillar odatda mushaklar funksiyasining pasayishi bilan bog’liq deb tan olinadi.

Klinik taqdim va tashxis. Uremik miyopatiya bir qator belgilar va simptomlar bilan tavsiflanadi, shu jumladan mushaklar kuchsizligi va proksimal va distal mushaklarni o‘z ichiga olgan zaiflik, chidamlilik va jismoniy mashqlar qobiliyatining pasayishi va oson charchash [3, 42]. Koptokchalar filtratsiya tezligi pasayishi bilan jiddiylik kuchayadi; eng og’ir holatlar gemodializ bemorlari orasida tasvirlangan [3, 43].

Zaiflikdan tashqari, jismoniy tekshiruv o‘zgarishsizdir. Elektromiyografik tadqiqotlar va mushak fermentlari ham o‘zgarishsizdir [3].

Mushak biopsiyalari xarakterli strukturaviy, elektrolitlar va fermentativ anomaliyalarni ko‘rsatadi [3, 44–46]. Sakkizta SBK bilan kasallangan bemorlarning mushak biopsiyalari sog’lom odamlar bilan solishtirilgan kichik tadqiqotda yorug’lik mikroskopida atrofiya, ayniqsa 2-toifa mushak tolalari (ya‘ni «tez qizzaruvchan» yoki anaerobik) va generatsiyasi va degeneratsiyasi ko‘rsatilgan [44]. Elektron mikroskopda mitoxondrial o‘zgarishlar, miofilamentlarning yo‘qolishi va hujayra ichidagi glikogenning to‘planishi ko‘rsatilgan. Biroq, mushaklarning strukturaviy anormalliklari funksional buzilishlar bilan qanchalik yaqin bog’liqligi aniq emas [1, 2, 47].

Skrining (profilaktik tibbiy ko‘rikni o‘z ichiga olgan chora-tadbirlar majmuasi). Biz gemodializ bilan og’rigan bemorlarning ko‘pchiligini va simptomlari ularning birgalikdagi kasalliklariga mutanosib ravishda namoyon bo‘ladigan gemodializ bo‘lmagan SBK bemorlarini funksional cheklovlar uchun tekshiramiz. Jismoniy ko‘rsatkichlar ma‘lum qilingan funksional cheklash uchun skrining tekshiruvi (yurish va zinapoyaga ko‘tarilish kabi asosiy faoliyatdagi cheklovlar bilan belgilanadi) keyingi funksional pasayish, nogironlik va o‘limni oshirish xavfi ostida bo‘lgan bemorlarni aniqlashi mumkin [4, 5].

Funksional va harakatchanlik cheklovlarini baholash uchun quyidagi skrining savollari taklif qilingan:

1. Siz 400 metrga yurish yoki 10 zinapoyaga chiqishda qiynalayapsizmi?
2. Siz 400 metrga yurgan yo‘lingizni o‘zgartirdingizmi yoki jismoniy holat tufayli buni qanchalik tez-tez qilasiz?

Bundan tashqari, jismoniy ko‘rsatkichlar obyektiv ravishda aniqlanishi mumkin. Jismoniy funksiyaning bir nechta testlari mavjud bo‘lib, ularni qo‘llash oson va odatda SBK bo‘lmagan bemorlarda qo‘llaniladi, jumladan, olti daqiqalik yurish testi, yurishni tezlikka va vaqtga baholash [48]. Yurish tezligini o‘lchash uchun bemor odatdagi tezligida 3 metrdan ortiq yuradi va kerak bo‘lganda to‘xtab, dam olishga ruxsat beriladi. Yurish tezligi 0,8 m/s dan past bo‘lsa, SBK bilan og’rigan bemorlarda o‘limning oshishi bilan bog’liq [49]. Turib vaqtga yurish testida bemor to‘liq o‘tirgan joyidan turishi va 4 metr yurishi kerak; vaqt ≥4 soniya oshishi SBKda o‘limning oshishi bilan bog’liq.

Ko‘pgina transplantatsiya markazlari hozirda buyrak transplantatsiyasiga yaroqlilik uchun skrining mezonlari sifatida jismoniy funksiyaning obyektiv o‘lchovlaridan foydalanmoqda.

Oldini olish. Miopatiyani to‘liq oldini olish mumkin emas, ayniqsa uremiya bilan bevosita bog’liq bo‘lgan jihatlar (ya‘ni, oksidlanish shikastlanishi va mitoxondrial ajralish). Biroq, harakatsiz turmush tarzini oldini olish yoki davolash mushaklarning klinik jihatdan ahamiyatli buzilishining rivojlanishini kechiktirishi yoki yumshatishi mumkin [50]. Barcha bemorlarga yondashuvimiz mashqlar rejimini hamda D vitamini yetishmovchiligi, kamqonlik va ovqatlanishni optimal davolashni o‘z ichiga oladi va quyida tavsiflanadi. Tanlangan bemorlarda ushbu choralarga qaramay, doimiy va zaiflashtiruvchi miopatiya va atrofiya bo‘ladi. Bunday bemorlar fizioterapevt yoki jismoniy mashqlar fiziologiga murojaat qilish, shuningdek, farmakologik davolash usullaridan foydalanishlari mumkin.

Faol turmush tarzi va jismoniy mashqlar – barcha SBK bilan og’rigan bemorlarga, shu jumladan gemodializda bo‘lganlarga faol hayot tarzini saqlab qolish uchun maslahat beramiz. Jismoniy faollik ko‘p foyda keltiradi, shu jumladan mushaklar buzilishining rivojlanishini oldini oladi [50].

Gemodializsiz SBK bilan og’rigan bemorlar – SBK bilan og’rigan bemorlar umumiy aholi uchun mavjud bo‘lgan aerob mashqlari, mushaklarni kuchaytirish, moslashuvchanlik va muvozanat bo‘yicha tavsiyalarga amal qilishlari kerak.

Gemodializ bemorlari uchun jismoniy mashqlar miqdori bemorning imkoniyatlariga bog’liq. Mashq qilishning oqilona dozasi kuniga kamida 4000 qadam yurish bo‘ladi [51] va bu yondashuv, hatto keksa bemorlarda ham [19, 52] tasodifiy sinovda ijobiy ta‘sir ko‘rsatdi.

Biroq, funksional jihatdan cheklangan yoki zaif odamlar hech qachon tavsiya etilgan minimal faollik darajasiga erisha olmasligi mumkin bo‘lsa-da, hatto oddiy faollik va mushaklarning kuchayishi ham funksional cheklovlarning rivojlanishiga ta‘sir qilishi mumkin [53, 54]. Jismoniy faollik bo‘yicha tavsiyalarning barcha elementlari faoliyat rejasiga kiritilishi kerak bo‘lsa-da, «pastdan boshlang va sekin yuring» degan maqolni yodda tutish kerak. Boshlang’ich nuqta sifatida kuniga ikki marta besh daqiqa yurish bo‘yicha asosiy jismoniy faoliyat tavsiyalarini boshlash ma’quldir. Asosiysi, bemor o‘zini bajarishga qodir bo‘lgan harakatlar to‘plamini aniqlash, shuning uchun o‘z-o‘zini samaradorlik konsepsiyasini jismoniy faoliyat tavsiyalariga kiritish [55]. Ba‘zi gemodializ markazlari, gemodializ paytida davolash kafedrasida gemodializ markazida statsionar velosipedni taklif qildi. Yaxshilanish ushbu oddiy dasturdan keyin 12 hafta ichida sodir bo‘ladi, ammo

bemorlarning atigi 20 foizi muntazam ravishda qatnashadilar [56].

Peritoneal gemodializ bilan og'rigan bemorlar gemodializ bilan og'rigan bemorlar kabi past jismoniy ko'rsatkichlarga ega [57]. Peritoneal gemodializ bilan oladigan bemorlar uchun keng jamoatchilikka tavsiya etilgan ko'rsatmalarga rioya qilgan holda uyda cho'zish va yurish dasturi tavsiya etiladi [58].

Jismoniy terapiya buyrak kasalligining oxirgi bosqichi bilan og'rigan bemorlarni parvarish qilishda muntazam ravishda qo'llanilmagan. Mumkin bo'lgan foyda bor deb hisoblansa-da, SBK oxirgi bosqichi tashxisi qo'yilgandan keyin fizioterapevt yoki jismoniy mashqlar fiziologiga muntazam ravishda murojaat qilishning foydasi, hech qanday katta sinovda o'rganilmagan.

Jismoniy mashqlarning foydasi. Atrofiya va miopatiyaning oldini olish bir qator tadqiqotlar shuni ko'rsatdiki, mashqlar gemodializ bo'lmagan SBK bilan og'rigan bemorlarda, shu jumladan past oqsilli parhezda bo'lganlarda mushaklarning massasi va funksiyasini saqlab qolish yoki yaxshilashga yordam beradi [17, 18, 59–68]. Eng yaxshi ma'lumotlar tasodifiy sinovlarning ikkita meta-tahlilidan olingan bo'lib, ular mashqlar bilan mushaklar kuchini yaxshilashni ko'rsatdi [17, 18]. Mashqlar soni yoki davomiyligidan qat'i nazar, SBKning barcha bosqichlarida, shu jumladan gemodializdagi bemorlarda mushaklar kuchini yaxshilaydi [17]. Gemodializ bilan og'rigan bemorlarda mushaklar hajmini oshadi.

Meta-tahlillardan so'ng e'lon qilingan sinovda gemodializdagi 296 nafar bemor tasodifiy ravishda olti oylik yurish mashqlari dasturiga yoki odatdagi jismoniy faoliyatga tayinlangan [19]. Olti oyda jismoniy mashqlar guruhidagi bemorlar boshlang'ich bilan solishtirganda o'lchangan jismoniy ko'rsatkichlarda yaxshilanishni boshdan kechirdilar (olti daqiqalik yurish masofasi va besh marta o'tirish-turish sinov vaqti bilan aniqlangan), odatdagi faoliyat guruhidagi bemorlar esa bu ko'rsatkichga ega emaslar. Bundan tashqari, yurish mashqlari guruhidagi bemorlar odatdagi jismoniy faollik guruhidagi bemorlarga nisbatan kasalxonaga yotqizish darajasi pastroq (100 kishiga 57 kasalxonaga yotqizish mos ravishda 35) va buyrak kasalliklari sifati bo'yicha kognitiv va ijtimoiy o'zaro ta'sir ko'rsatkichlari yaxshilangan.

KFT pasayishining sekinlashishi – ko'p tadqiqotlar shuni ko'rsatdiki, jismoniy mashqlar buyrak funksiyasining pasayishini sekinlashtiradi va gemodializga muhtoj bo'lish xavfini kamaytiradi

Uzoq muddatli ma'lumotlar faqat kuzatuv tadqiqotlari bilan cheklangan. Uzoq muddatli kogort tadqiqoti to'rt haftalik jismoniy faollik tarixi so'rovnomasi yordamida miqdoriy aniqlangan jismoniy faollikni o'rtacha 3,7 yil davomida KFTning o'lchovi bilan taqqosladi [70]. Haftada 150 daqiqadan ko'proq jismoniy faollik haqida xabar bergan shaxslar faol bo'lmaganlar bilan solishtirganda KFT sekinroq pasaygan (mos ravishda yiliga 6,2 foizga 9,6 foiz). O'rtacha 3,7 yillik kuzatuvda haftalik faoliyatning har 60 daqiqalik o'sishi tuzatilgan tahlilda buyrak funksiyasining 0,5 foizga sekin pasayishi bilan bog'liq edi.

Yurak qon tomir tizimiga foyda – kam harakat turmush tarzining yurak – qon tomir kasalliklari va o'limga salbiy ta'siri yaxshi ma'lum, jismoniy mashqlar foydasi kuzatuv tadqiqotlari tomonidan taklif qilingan [72]. Bir nechta tadqiqotlar gemodializ bilan og'rigan bemorlarda omon qolish va jismoniy mashqlar o'rtasidagi bog'liqlikni o'rganib chiqdi [71, 73, 74].

Xitoylik 6363 bemorning bir tadqiqotida piyoda yurish gemodializsiz SBK bilan og'rigan bemorlarda o'limning pasayishi bilan bog'liq [71].

Gemodializ natijalari va amaliyot namunalarini o'rganish (DOPPS) ma'lumotlarini tahlil qilinganda 5763 ishtirokchi jismoniy faollikning ortib borishi darajasi, aerobik faollik o'limning pasayishi bilan bog'liq edi [74].

Ushbu tadqiqotda aerobik faollik salomatlik bilan bog'liq hayot sifatining oshishi va depressiyaning pasayishi bilan ham bog'liq edi.

Jismoniy mashqlarning boshqa afzalliklari aerob qobiliyatini va yurak qon tomir funksiyasini yaxshilashni o'z ichiga oladi [17], bezovta oyoq sindromi zo'ravonligining pasayishi va uyqu sifatining yaxshilanishi [75], umuman hayot sifatini yaxshilash va KDQOL-SF so'rovnomasi [18, 9] tomonidan baholangan ijtimoiy o'zaro ta'sirlarni yaxshilash.

Davolash. Yuqorida tavsiflangan profilaktik davolash usullariga qaramasdan, ba'zi bemorlarda doimiy va zaiflashtiruvchi zaiflik bo'ladi (odatda yuqorida tavsiflanganidek skrining orqali aniqlanadi). Bunday bemorlarni fizioterapevt yoki jismoniy mashqlar fiziologiga yuborishdan tashqari, farmakologik davolash usullari testosteron va karnitin qo'shimchasini o'z ichiga oladi:

Doimiy va zaiflashtiruvchi kuchsizligi bo'lgan va androgen terapiyasiga qarama-qarshiliklarga ega bo'lmagan barcha erkak bemorlarda testosteron yetishmovchiligini baholash va agar mavjud bo'lsa, uch oy davomida testosteronni almashtirish terapiyasi bilan davolash va mushaklar kuchini qayta baholash kerak. Agar bemor mushak kuchining yaxshilanishini ko'rsatsa, biz testosteron terapiyasini cheksiz davom ettiramiz. Agar bemor mushak kuchida yaxshilanishni ko'rsatmasa, biz testosteron terapiyasini to'xtatamiz.

Testosteron yetishmovchiligi bo'lmagan yoki testosteronni almashtirish terapiyasiga javob bermaydigan gemodializdagi erkaklarda vena ichiga L-karnitin qo'shimchasini (haftada uch marta 1000 mgdan) uch oydan olti oygacha sinovdan o'tkazish mumkin. Gemodializ bilan og'rigan bemorlarda, vena ichiga L-karnitinni qo'llash munozarali bo'lib qolmoqda. Karnitin tanqisligining biokimyoviy diagnostikasi qiyin, chunki deyarli barcha gemodializdagi bemorlarida qon zardobidagi karnitin darajasida anormallik mavjud va hech qanday tadqiqot turli xil qon karnitin o'lchovlari va mushaklar funksiyasi o'rtasidagi bog'liqlikni ko'rsatmagan. L-karnitinga javob o'ziga xos bo'lishi mumkin, ba'zi bemorlarda mushaklar funksiyasining yaxshilanishi bilan ko'rinadi [77].

Doimiy va zaiflashtiruvchi zaifligi bo‘lgan ayol bemorlarda biz testosteron yetishmovchiligini muntazam ravishda baholamaymiz, chunki ayollarda androgen terapiyasining roli ayollarda jinsiy qiziqish / qo‘zg’alish (libido) buzilishi tashxisi bilan postmenopozal ayollarni davolash bilan chegaralanadi. Gemodializ oladigan bemorlarda L-karnitinning vena ichiga uch oydan olti oygacha bo‘lgan sinovini erkak bemorlar uchun yuqorida muhokama qilinganidek ko‘rib chiqish mumkin.

Biz o‘sish gormonini bermaymiz. Insonning rekombinant o‘sish gormoni (rhGH) ning anabolik ta‘siri ko‘plab mushaklarni yo‘qotadigan sharoitlarda, shu jumladan SBKda [78] qayd etilgan bo‘lsa-da, rhGH qo‘llanilishi bilan jismoniy funksiya va kuchning barqaror yaxshilanishini ko‘rsatadigan juda kam ma‘lumotlar mavjud. 20 nafar bemorning platsebo-nazoratli tadqiqotida gemodializdan so‘ng haftasiga uch marta 66,7 mkg/kg teri osti rhGH bilan tutqich kuchi va anabolik ta‘sir kuchayganligi qayd etildi [79]. Xalqaro ko‘p tadqiqotli sinovida III bosqichida, 2000 dan ortiq gemodializ bemorlarining, tadqiqot muddatdan oldin tugatildi, ammo kamida bitta dozani qabul qilgan 695 bemorda ushlab turish kuchi yoki yurish qobiliyati yaxshilanmadi [80].

Bashorat. Mushaklar kuchining pasayishi o‘limning ortishi bilan bog’liq. Bu eng yaxshi kuzatuv tadqiqotida ko‘rsatilgan, jumladan 330 dializ bemori, ularning 29 foizi besh yil davomida vafot etgan [4]. Kuchlari pasaygan bemorlarda mushaklarning massasi normal bo‘lsa ham o‘lim xavfi ortdi (xavf darajasi [HR] 1,98, 95% CI 1,01–3,87). Kuchning kamayishi bo‘lmaganda mushak massasining kamayishi ushbu tadqiqotda o‘limni oshirmadi. Bu shuni ko‘rsatadiki, funksional baholash mushaklarning massasini baholashdan tashqari prognostik ma‘lumotlarni taqdim etishi mumkin.

Kuch va chidamlilikning pasayishi keksa gemodiyaliz bemorlari orasida keng tarqalgan zaiflikning muhim tarkibiy qismidir [81, 82]. Gemodializ bemorlarda zaiflik o‘limning oshishi [82–88] va sinishlarning ko‘payishi [89, 90], shuningdek, hayot sifatining pasayishi [91] bilan bog’liq.

Xulosa. Surunkali buyrak kasalligi bilan og’rigan bemorlarda, ayniqsa gemodializda bo‘lganlarda, ko‘pincha mushaklarning sezilarli zaifligi va chidamliligi yo‘q. Bu ko‘pincha harakatsiz turmush tarziga olib keladi, bu harakatsiz turmush tarzining kuchayishiga olib keladi va dializ bilan og’rigan bemorlarda kasallik va o‘limni oshiradi. Jismoniy mashqlar harakatsiz turmush tarzini ta‘sirini bekor qilishi yoki yumshatishi va omon qolishni yaxshilashi mumkin.

Chiziqli mushaklarning mitoxondrial samarado-rligining pasayishi SBKning dastlabki bosqichida sodir bo‘lishi mumkin. Shundan so‘ng, mushaklarning progressiv buzilishi harakatsiz turmush tarzidan kelib chiqadi. Eritropoetin, D vitamini va androgen yetishmovchiligi mushaklar kuchsizligi sababidan biri bo‘ladi.

Biz barcha gemodializ va gemodializsiz SBK bemorlarini funksional cheklovlarni tekshiramiz. Jismoniy ko‘rsatkichlarning skrining tekshiruvi bemorlarda nogironlik va o‘limning oshishi xavfini aniqlashi mumkin. Skrining savollari ishlatilishi mumkin yoki funksional testlar yordamida jismoniy ko‘rsatkichlar obyektiv ravishda aniqlanishi mumkin.

Harakatsiz turmush tarzini oldini olish yoki davolash mushaklarning klinik jihatdan ahamiyatli buzilishining rivojlanishini kechiktirishi yoki yumshatishi mumkin. Bizning barcha bemorlarga yondashuvimiz mashqlar rejimi, shuningdek, D vitamini yetishmovchiligi, kamqonlik va ovqatlanishni optimal davolashni o‘z ichiga oladi va yuqorida tavsiflangan. Ayniqsa, jismoniy mashqlar ko‘plab afzalliklarga ega, shu jumladan gemodializsiz SBK bilan og’rigan bemorlarda buyrak funksiyasini saqlab qolish va yurak qon tomir va omon qolish uchun mumkin bo‘lgan foydadir.

Profilaktik muolajalarga qaramasdan, ba‘zi bemorlarda doimiy va zaiflashtiruvchi zaiflik bo‘ladi. Bunday bemorlarni fizioterapevt yoki jismoniy mashqlar fiziologiga yuborishdan tashqari, farmakologik davolash usullari testosteron va karnitin qo‘shimchasini o‘z ichiga oladi. Biroq, ulardan muntazam foydalanishni tasdiqlovchi yuqori sifatli dalillar yo‘q.

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