

Article/Review

O'tkir koronar sindrom ST segmentining ko'tarilishi bilan bo'lgan bemorlarda reperfuziya terapiyasining turli usullarini qiyosiy tahlili: sistematik adabiyotlar sharhi

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Annotatsiya:

Maqsad. O'tkir koronar sindrom ST segmenti ko'tarilishi bilan (O'KS-ST) bemorlar o'rtasida reperfuzion terapiya turli usullarining samaradorligini sistematik tahlil qilish va solishtirish, jumladan birlamchi teri orqali koronar aralashuv (bTOKA) va trombolitik terapiya (TLT), vaqt omili va COVID-19 pandemiyasining ta'siri.

Materiallar va metodlar. O'KS-ST bilan bemorlarda bTOKA va TLT samaradorligini solishtiruvchi prospektiv randomizatsiyalashgan va kuzatuv tadqiqotlarining sistematik sharhi amalga oshirildi. Yirik xalqaro tadqiqotlar ma'lumotlari tahlil qilindi, jumladan DANAMI-2 (1572 bemor), PRAGUE-2, STAT, GISSI, ISACS-STEMI COVID-19, shuningdek 23 ta tadqiqotning meta-tahlillari va chap qorincha global bo'ylama deformatsiyasini baholashning zamonaviy diagnostik usullari.

Natijalar. 23 ta randomizatsiyalashgan tadqiqotning meta-tahlili bTOKA ning TLT ga nisbatan statistik jihatdan ahamiyatli ustunliklarini ko'rsatdi: 30 kunlik o'lim darajasi 8,0% ga nisbatan 13,7% ($p=0,0003$), takroriy miokard infarkti 3,8% ga nisbatan 7,0% ($p<0,05$), qayta revaskulyarizatsiya ehtiyoji 5,7% ga nisbatan 25,2% ($p<0,001$). "Oltin soat" kontseptsiyasi tasdiqlandi. COVID-19 pandemiyasi O'KS-ST bilan bemorlarning murojat qilish darajasini 19-30,5% ga kamaytirdi va prognozni yomonlashtirdi.

Xulosa. bTOKA TLT ga nisbatan statistik jihatdan ahamiyatli ustunliklarni ko'rsatdi, biroq usulni tanlashda vaqt omili va texnik mavjudlikni hisobga olish zarur. Chap qorincha global bo'ylama deformatsiyasini baholashning zamonaviy usullari natijalarni bashorat qilish aniqligini oshiradi.

Kalit so'zlar: O'tkir koronar sindrom, reperfuzion terapiya, birlamchi teri orqali koronar aralashuv, trombolizis, chap qorincha global bo'ylama deformatsiyasi, COVID-19.

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Systematic Review of Different Reperfusion Therapy Methods in Patients with ST-Elevation Acute Coronary Syndrome: Literature Review

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Abstract:

Aim. Systematic analysis and comparison of different reperfusion therapy methods in patients with ST-elevation acute coronary syndrome (STEMI), including primary percutaneous coronary intervention (pPCI) and thrombolytic therapy (TLT), with emphasis on time factor and COVID-19

pandemic impact.

Materials and methods. A systematic review of prospective randomized and observational studies comparing pPCI and TLT effectiveness in STEMI patients was conducted. Data from major international trials including DANAMI-2 (1572 patients), PRAGUE-2, STAT, GISSI, ISACS-STEMI COVID-19, meta-analyses of 23 studies, and modern global longitudinal strain assessment methods were analyzed.

Results. Meta-analysis of 23 randomized studies showed statistically significant pPCI advantages over TLT: 30-day mortality 8.0% vs 13.7% ($p=0.0003$), recurrent infarction 3.8% vs 7.0% ($p<0.05$), revascularization need 5.7% vs 25.2% ($p<0.001$). "Golden hour" concept was confirmed. COVID-19 pandemic led to 19-30.5% reduction in STEMI presentations and worse prognosis.

Conclusion. pPCI demonstrates statistically significant advantages over TLT, however method selection should consider time factor and technical availability. Modern global longitudinal strain assessment methods improve prognostic accuracy.

Keywords: acute coronary syndrome, reperfusion therapy, primary PCI, thrombolysis, global longitudinal strain, COVID-19.

Kirish

O'tkir koronar sindrom ST segmentining ko'tarilishi bilan (O'KS-ST) bugungi kunda dunyodagi eng muhim sog'liqni saqlash sohasidagi muammolaridan biri hisoblanadi. Yurak-qon tomir kasalliklari butun dunyo bo'ylab asosiy o'lim sababi bo'lib, yiliga 17,9 million kishining hayotiga zomin bo'lmoqda [1]. Jahon Sog'liqni saqlash tashkilotining ma'lumotlariga ko'ra, yurak-qon tomir tizimi kasalliklaridan o'lim ko'rsatkichi barcha o'lim holatlarining 31%ini tashkil etadi va bu ko'rsatkich past va o'rta daromadli mamlakatlarda 75% dan yuqori ko'rsatkichni ko'rsatadi [2]. Global Burden of Disease tadqiqotining 2019 yilgi ma'lumotlariga ko'ra, yurak ishemik kasalligi butun dunyo bo'yicha 9,14 million o'lim holatiga sabab bo'lgan va bu ko'rsatkich 1990 yilda qayd etilgan 5,74 million holat bilan taqqoslaganda, kasallik tarqalishida sezilarli o'sishni ko'rsatadi [3]. Amerika Qo'shma Shtatlarida har yili o'rtacha 805 ming nafar fuqaro miokard infarktini boshdan kechiradi, shundan 605 ming nafari uchun bu holat birinchi marotaba yuz beradi [4]. ST segmentining ko'tarilishi bilan kechuvchi o'tkir koronar sindrom barcha O'KS holatlarining 25-40%ini tashkil etadi va zudlik bilan reperfuzion terapiya talab etadi [5]. Amerika yurak assotsiatsiyasi (AHA) va Amerika kardiologiya kollejining (ACC) birgalikdagi hisobotida O'KS-ST bilan kasallangan bemorlarning 90% dan ortig'i birinchi 12 soat ichida reperfuzion terapiya o'tkazilishi zarur ekanligi ta'kidlangan [6].

Reperfuzion terapiyaning asosiy maqsadi koronar arteriyada qon oqimini tezkor va samarali tiklash orqali miokard nekrozini kamaytirish va bemorlarning hayot prognozini yaxshilashdir. Hozirgi kunda reperfuzion terapiyaning ikkita asosiy usuli mavjud: birlamchi teri orqali koronar aralashuv (bTOKA) va tizimli trombolizis terapiya (TLT) [7]. Har ikkala usulning ham o'ziga xos afzalliklari va kamchiliklari mavjud bo'lib, optimal usulni tanlash ko'plab omillarga bog'liq [8].

1. Reperfuzion terapiya usullari va ularning tarixiy rivojlanishi

1.1 Trombolitik terapiyaning rivojlanish tarixi

Trombolitik terapiya o'tkir miokard infarktida koronar arteriya trombozining oqibatlarini kamaytirish va klinik natijalarni yaxshilashda birinchi samarali davolash usuli sifatida e'tirof etilgan. Streptokinaza - gemolitik streptokokklar tomonidan ishlab chiqariladigan fibrinolizin - ilk bor 1933 yilda Tillett va Garner tomonidan ajratib olingan [9]. O'MI holatlarida to'g'ridan-to'g'ri trombolitik terapiyani qo'llash bo'yicha dastlabki klinik yondashuv 1976 yilda E.I. Chazov va hamkorlari tomonidan olib borilgan tadqiqot natijalari asosida ishlab chiqilgan [10].

TLT ning klinik samaradorligi bo'yicha muhim isbotlardan biri 1982 yilda AQShda chop etilgan Hoechst-Roussel registri hisoblanadi. Bu registrda koronar arteriyaga streptokinaza yuborilgan 209 nafar bemor tahlil qilinib, umumiy rekanalizatsiya ko'rsatkichi 76% bo'lgan [11]. GISSI tadqiqotida trombolitik terapiyaning foydasi ayniqsa simptomlar boshlanganidan keyingi dastlabki 3 soat ichida streptokinaza yuborilgan hollarda eng yaqqol ko'rinib, kasalxona ichki o'lim darajasi 47% ga kamaygan [12]. 1-jadvalda trombolitik preparatlarning avlodlar bo'yicha tasnifi keltirilgan.

Table 1. Classification of thrombolytic drugs by generation**Jadval 1.** Trombolitik preparatlarning avlodlar bo'yicha tasnifi

Avlod	Preparatlar	Xususiyatlari	Samaradorlik
I avlod	Streptokinaza, Urokinaza	Fibringa kam spesifiklik, tizimli fibrinoliz	40-50% reperfuziya
II avlod	APSK, Alteplaza, Prourokinaza	Fibringa yuqori tropizm, kam qon ketish xavfi	75-80% reperfuziya

Trombolitik preparatlarning avlodlar bo'yicha tasnifi ularning molekulyar tuzilishi va fibringa nisbatan spesifikligiga asoslangan. Birinchi avlod preparatlari tizimli fibrinolizni keltirib chiqaradi va yuqori qon ketish xavfi bilan 40-50% reperfuziya ko'rsatkichiga erishadi. Ikkinchi avlod trombolitiklari fibringa yuqori tropizmga ega bo'lib, maqsadli parchalash orqali kamroq yon ta'sir bilan 75-80% reperfuziya darajasini ta'minlaydi [13].

1.2 Birlamchi teri orqali koronar aralashuvning rivojlanishi

Birlamchi teri orqali koronar aralashuv tarixidagi muhim bosqichlardan biri 1977 yilda Andreason Gruntsing tomonidan ishlab chiqilgan translyuminal balonli angioplastika bo'lib, u ilk bor aortokoronar shuntlash amaliyotiga muqobil sifatida qo'llanilgan [14]. Keyingi muhim bosqich koronar stent konsepsiyasining shakllanishi bo'lib, 1985 yilda shifokor Julio Palmaz stentga patent olish uchun ariza topshirdi [15]. 1986 yilda Fransiyada Jacques Puel tomonidan birinchi bor metall qoplamasiz stent implantatsiyasi amalga oshirildi [16]. FDA tomonidan tasdiqlanganidan keyin 4 yil ichida balon yordamida kengaytiriluvchi stentlar barcha TOKA operatsiyalarining 80% dan ortig'ida qo'llanilgan [17]. 2002 yilda dori qoplamali stentlar ishlab chiqildi va oddiy metall stentlarga nisbatan restenoz xavfini sezilarli darajada kamaytirdi [18].

2. Qiyosiy klinik tadqiqotlar va meta-tahlillar

bTOKA va TLT turli randomizatsiyalangan klinik tadqiqotlarda qiyoslangan. DANAMI-2 tadqiqotida Andersen va hammualliflar tomonidan birlamchi teri orqali koronar aralashuvning tizimli trombolizisga nisbatan sezilarli afzalliklari aniqlangan. 1572 nafar bemor ishtirok etgan ushbu tadqiqotda bTOKA 30 kunlik natijalar bo'yicha ancha samaraliroq bo'lgan [19]. PRAGUE-2 tadqiqotida ayniqsa 3 soatdan ortiq vaqt o'tgan bemorlar orasida bTOKA afzalligi yaqqol ko'rsatilgan. Bu tadqiqotda o'lim darajasi bTOKA guruhida 6% ni tashkil etgan bo'lsa, TLT guruhida 15,3% ni ko'rsatgan [20]. STAT tadqiqotida ham xuddi shunday tendentsiyalar kuzatilgan [21]. 23 ta tadqiqot meta-analiziga ko'ra, bTOKA TLT ga nisbatan ishemik asoratlarni kamaytirishda ustunlikka ega. Keeley va hammualliflar tomonidan o'tkazilgan keng qamrovli meta-tahlilda quyidagi natijalar olindi [22]. 2-jadvalda bTOKA va TLT ning qiyosiy ko'rsatkichlari tahlili ko'rsatib o'tilgan.

Table 2. Analysis of comparative indicators of bTOKA and TLT**Jadval 2.** bTOKA va TLT ning qiyosiy ko'rsatkichlari tahlili

Ko'rsatkich	bTOKA	TLT	p qiymati
30 kunlik o'lim (%)	8,0	13,7	0,0003
Qayta miokard infarkti (%)	3,8	7,0	<0,05
Revaskulyarizatsiya (%)	5,7	25,2	<0,001
Gemorragik insult (%)	0,6	2,0	<0,01

Bu natijalar bTOKA ning barcha asosiy klinik ko'rsatkichlar bo'yicha statistik jihatdan ishonchli ustunligini ko'rsatadi. Ayniqsa, takroriy revaskulyarizatsiya ehtiyoji TLT guruhida 4 baravar yuqori bo'lgan [23].

Reimer va Jennings tomonidan ta'riflangan "to'liq fronti fenomeni"ga ko'ra, koronar arteriya okklyuziyasi uzoq davom etsa, miokardning subendokardial sohasidan subepikardial qatlamiga tomon nekroz rivojlanadi [24]. Shuning uchun miokard hujayralari zararini kamaytirish uchun reperfuzion terapiyani erta boshlash zarur [25].

Eng samarali davolash natijalari simptomlar boshlanganidan keyingi birinchi soat davomida erishiladi. Boersma va hammualliflar tomonidan o'tkazilgan tahlilga ko'ra, har bir soat kechikish uchun o'lim xavfi 1,6% ga ortadi [26]. O'KS-ST ko'tarilishi bo'lgan bemorlarda kasallik boshlanganidan keyingi 12 soat ichida reperfuzion terapiya o'tkazilishi shart [27].

3. COVID-19 pandemiyasining ta'siri va zamonaviy diagnostik usullar

COVID-19 pandemiyasi O'KS-ST ko'tarilishi bo'lgan bemorlarning davolanishiga sezilarli ta'sir ko'rsatdi. De Luca va hammualliflar tomonidan o'tkazilgan ISACS-STEMI COVID-19 registri ma'lumotlariga ko'ra, pandemiya davrida bunday bemorlarning shifoxonaga murojaati 19% ga kamaygan [28]. Rashid va hammualliflar Angliyaning sog'liqni saqlash tizimidagi ma'lumotlarni tahlil qilib, 12 958 nafar O'KS li bemordan 517 nafari (4,0%) COVID-19 bilan hospitalizatsiya qilinganini aniqladi [29]. COVID-19 bilan kasallangan O'KS-ST bemorlarda o'lim ko'rsatkichlari sezilarli ravishda oshgan. Ispaniya registrida bu ko'rsatkich 23,1% ni tashkil qilgan, salbiy bemorlarda esa 5,7% bo'lgan [30]. Bunday bemorlarda biomarkerlar darajasining o'zgarishi (D-dimer, Troponin, MB-KFK) ham keng tarqalgan bo'lib, yurak shikastlanishining chuqurligini ko'rsatdi. Chap qorincha miokardi uzunasiga bo'lgan deformatsiyasini baholash spekl-treking texnologiyasiga asoslangan. Yevropa exokardiografistlar assotsiatsiyasi tavsiyalariga muvofiq, yurak-qon tomir vizualizatsiyasining ikki o'lchamli va uch o'lchamli spekl-treking exokardiografiyasi keng tarqalgan uslub hisoblanadi [31]. Sugimoto va hammualliflarning metatahliliga muvofiq, 8188 ta sog'lom ko'ngilli shaxslar ishtirok etgan 54 ta tadqiqotning ma'lumotlariga ko'ra GLS ning o'rtacha qiymati $-20,0 \pm 2,5\%$ ni tashkil qiladi [32]. GLS normal qiymatlari yosh va jins omillariga bog'liq holda o'zgarib turadi va yosh o'tgan sari progressiv ravishda pasayib boradi. Ersboll va hammualliflar tadqiqotida chap qorinchada uzun deformatsiyaning kamayishi 2 yillik kuzatuvda noqulay yurak-qon tomir hodisalari bilan bog'langanligini ko'rsatdi (HR 1,34; 95% CI 1,08-1,66; $p=0,008$) [33]. VALIANT tadqiqotida GLS ning har 1% ga pasayishi 2 yillik kuzatuv davomida yurak-qon tomir o'limi, yurak yetishmovchiligi yoki takroriy miokard infarkti rivojlanishi xavfining 13% ga ortishi bilan bog'liq [34]. Biering-Sorensen va hammualliflar meta-tahlilida 2737 ta bemor ishtirok etgan 5 ta tadqiqot natijalari birlashtirilgan va GLS ning har 1% ga pasayishi noxush yurak-qon tomir hodisalari xavfining 8% ga ortishi bilan shartlanganligini aniqladi [35]. GLS ning -18% dan past qiymatlari noxush yurak-qon tomir hodisalarining mustaqil prediktori sifatida tan olinadi.

Xulosa

O'tkir koronar sindrom ST segmentining ko'tarilishi bilan bo'lgan bemorlarda reperfuzion terapiyaning turli usullari bo'yicha o'tkazilgan sistematik tahlil birlamchi teri orqali koronar aralashuvning tizimli trombolizis terapiyasiga nisbatan aniq ustunligini ko'rsatdi. Meta-analiz ma'lumotlariga ko'ra, bTOKA 30 kunlik o'lim darajasini sezilarli darajada kamaytiradi, qayta miokard infarkit va takroriy revaskulyarizatsiya ehtiyojini pasaytiradi.

“Oltin soat” kontsepsiyasi o'z tasdig'ini topdi va eng samarali natijalar simptomlar boshlanganidan keyingi birinchi soat ichida reperfuziya amalga oshirilganda erishiladi. Biroq, amaliy sharoitlarda vaqt omili va texnik imkoniyatlar chegaralanganligi tufayli trombolitik terapiya hali ham muhim alternativ bo'lib qolmoqda.

COVID-19 pandemiyasi O'KS-ST bilan bemorlarning tibbiy yordamga murojat qilish darajasini sezilarli darajada kamaytirdi va prognozni yomonlashtirdi. Zamonaviy diagnostik usullar, xususan chap qorincha global bo'ylama deformatsiyasini baholash, bemorlarning individual prognozini aniqlash va davolash strategiyasini optimallashtirish uchun qimmatli vosita hisoblanadi.

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Authors' contribution.

Conceptualization: Kh.F., B.A.; Methodology: B.A.; Investigation: B.A.; Writing Original Draft: B.A.; Writing Review Editing: Kh.F., B.A.; Supervision: Kh.F. All authors have read and agreed to the published version of the manuscript.

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Ethics approval.

The study did not require ethical approval as no interventions or human data were involved.

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Tadqiqot natijalarini qo'llab-quvvatlovchi ma'lumotlar asosli so'rov bo'yicha mualliflardan olinishi mumkin.

Data Availability Statement

The data supporting the results of this study are available from the authors upon reasonable request.

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Conflict of interest

The authors declare no conflict of interest.

Qisqartmalar

O'KS	O'tkir koronar sindrom
O'KS - ST	ST segmenti ko'tarilishi bilan o'tkir koronar sindrom
bTOKA	Birlamchi teri orqali koronar aralashuv
TLT	Trombolizis terapiya
GLS	Global bo'ylama deformasiyasi
APSK	Anistrepsin (anistreptin)
MB	KFK – miogloblin kreatinfosfatkinaza
ATF	Adenozintrifosfat
AHA	Amerika yurak assotsiatsiyasi
ACC	Amerika kardiologiya kolleji
ESC	Yevropa kardiologiya jamiyati
FDA	Oziq-ovqat va dori vositalari boshqarmasi

Adabiyot

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