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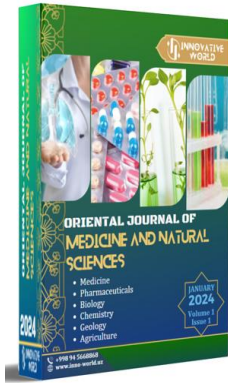


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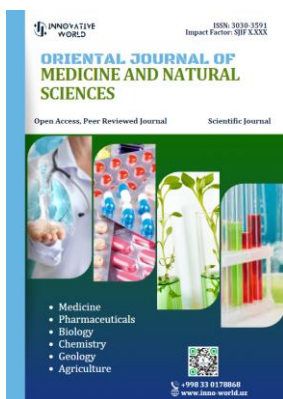
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К вопросу исхода беременности при преэклампсии

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Резюме: В наших исследованиях изучено факторы предрасполагающие к развитию преэклампсии, течение беременности и родов у женщин с гипертензивными расстройствами. Проведён ретроспективный анализ истории беременности и родов женщин, у которых беременность осложнилась гипертензивными состояниями, предоставленных Областным Перинатальным центре (ОПЦ) города Бухары за 2021-2022г.

Ключевые слова: преэклампсия, гипертензия, роды

Resume: In this research, we studied factors predisposing to the development of preeclampsia, the course of pregnancy and childbirth in women with hypertensive disorders. Retrospective analysis of the history of childbirth of women in which pregnancy was complicated by hypertensive condition provided by the regional perinatal center of the city of Bukhara for 2021-2022y.

Key words : preeclampsia, hypertension, childbirth

Актуальность проблемы преэклампсии (ПЭ) обусловлена ее относительно высокой частотой, не имеющей тенденции к снижению. В настоящее время, по данным Всемирной организации здравоохранения (ВОЗ), ПЭ в среднем осложняет течение 2,2% беременностей, есть тенденция роста частоты ее встречаемости независимо от экономического развития страны. Материнская смертность от ПЭ и эклампсии достигает 1,8% в развитых странах и 14,0% в развивающихся. Резервами снижения материнской и перинатальной заболеваемости и смертности являются прогнозирование, доклиническая диагностика, профилактика преэклампсии и её осложнений. В настоящее время не вызывает сомнения, что выбор наиболее оптимального метода ведения беременности и родов невозможен без учета степени акушерского и перинатального риска[1,2].

Клинические проявления преэклампсии развиваются после 20 недель беременности и присущи только женщине во время беременности и родов. Преэклампсия представляет собой прогрессирующее осложнение беременности, формы проявления

которой могут быть самыми различными, равно как и темпы нарастания клинических симптомов, поэтому прогнозировать дальнейший ход ее развития не всегда возможно. Единственным радикальным методом терапии данного осложнения беременности является родоразрешение[4,8].

Соматические заболевания, отягощенный акушерско-гинекологический анамнез могут оказать влияние на инициальное звено патогенеза преэклампсии, которое возникает и разворачивается в маточно-плацентарной области. Недостаточная инвазия цитотрофобласта и неполная гестационная перестройка спиральных и радиальных артерий являются причиной снижения маточно-плацентарного кровотока, что приводит к последующему развитию плацентарной ишемии. Неадекватная плацентация, нарастающая ишемия плацентарной ткани могут спровоцировать выброс цитотоксических факторов, которые вызывают эндотелиоз микроциркуляторного русла органов-мишеней. Создается дисбаланс вазоактивных веществ, в результате чего развивается симптомокомплекс преэклампсии. Проникновение в организм матери одного или нескольких факторов, разрушающих сосудистые эндотелиальные клетки, обуславливает дисфункцию многих систем организма, развитие органной недостаточности и неблагоприятный исход как для матери, так и для плода[3,5,9].

На фоне артериальной гипертензии часто развиваются плацентарная недостаточность и синдром задержки роста плода, значительно увеличивается риск отслойки плаценты, отслойки сетчатки, эклампсии, внутримозговых кровоизлияний, массивных коагулопатических кровотечений. В последующие годы жизни женщины, у которых беременность протекала с гипертензионным синдромом, чаще страдают сердечно-сосудистыми и эндокринными заболеваниями, у их детей повышен риск различных метаболических и гормональных нарушений, а также сердечнососудистой патологии [6,7,10].

Учитывая высокие показатели материнской и перинатальной смертности, развитие грозных и тяжёлых осложнений при преэклампсии, было решено провести настоящее исследование.

Цель исследования: изучение факторов, предрасполагающих к развитию преэклампсии, течение беременности и родов у женщин с гипертензивными расстройствами.

Материалы и методы исследования: Проведён ретроспективный анализ истории родов женщин, у которых беременность осложнилась гипертензивными состояниями, в период с 2021 г. по 2022 г, предоставленных Областном Перинатальным центре города Бухары.

Диагностическими критериями легкой и тяжёлой преэклампсии являлись повышение артериального давления ($\geq 140/90$ мм рт. ст. и

≥160/110 мм рт. ст., соответственно), суточная протеинурия или сочетание одного, или нескольких угрожающих симптомов, таких как сильные постоянные головные боли, боли в эпигастрии, олигурия, нарушение зрения, одышка, а при эклампсии – судороги.

Материалы для исследования включали медицинскую документацию пациенток, результаты лабораторных анализов (общий анализ крови и биохимический анализ крови), ультразвуковые заключения и данные различных анализов мочи на наличие белка.

Статистическая обработка проводилась с помощью пакета программ STATISTICA 6.0 (StatSoft, США) и MS Excell 2007. Количественные данные представлены в виде средних значений (M) плюс-минус стандартное отклонение ($\pm SD$) в случае близкого к нормальному распределения признака.

Результаты исследования: За 2021-2022год в ОПЦ было 6273 родов. Из них роды осложнённые с преэклампсией тяжелой степени у 358(5.7%) рожениц, с преэклампсией легкой степени у 72 (1.1%) Общие количество преэклампсии у 430 беременных, которые составили 6.8% от общих родов. Гестационная гипертензия установлено у 276 (4.4 %) женщин, только у одной женщины отмечалось эклампсия. 73 (11,6%) у беременных в стационаре гестационная гипертензия перешла в преэклампсию тяжелой степени. 81 беременные с легкой преэклампсией перешли в преэклампсию тяжелой степени на фоне консервативной терапии. У 1 (0,16%) беременных преэклампсия тяжелой степени осложнилась эклампсией.

Анализ возникновения гипертензивных нарушений преэклампсии тяжелой и легкой степени в зависимости от возраста пациенток, которые разделены на возрастные группы, представлен в таблице 1. Полученные данные показали, что гипертензивные нарушения в виде преэклампсии имеют тенденцию развития у молодых беременных женщин (в возрастной группе от 23 до 29 лет), следовательно, молодые женщины больше подвержены гипертензивным состоянием.

Таблица № 1. Возникновение преэклампсии в зависимости от возраста

Возраст беременной	Кол-во случаев	%
17-22	22	4
23-29	267	57.6
30-34	98	26.4
35 и более	43	8.2
Итого	430	100

Как видно из данной таблицы 57,6 % женщин возраст в среднем составил 25,5 + 1,9, и 26,4% женщины возрасте от 30 до 34 лет.

У женщин с преэклампсией из соматических заболеваний часто развивалась анемия различной степени у 339 (79 %), заболевания сердца у 8 (1,2%), почек (ИМТ) у 103 (24%) и заболевание печени у 13 (3%), гипертензия и диабеты в 9 (2%) случаев. Как видно, эти факторы могут быть признаны как относительно предрасполагающие факторы возникновения гипертензивных нарушений.

При изучении введение родов, было отмечено всего вагинальных родов с преэклампсией тяжелой степени 136 (38.0%) случаев. Обезболивание в родах центральными анальгетиками у 115 женщин, и обезболивание методом эпидуральной анестезии у 21 рожениц.

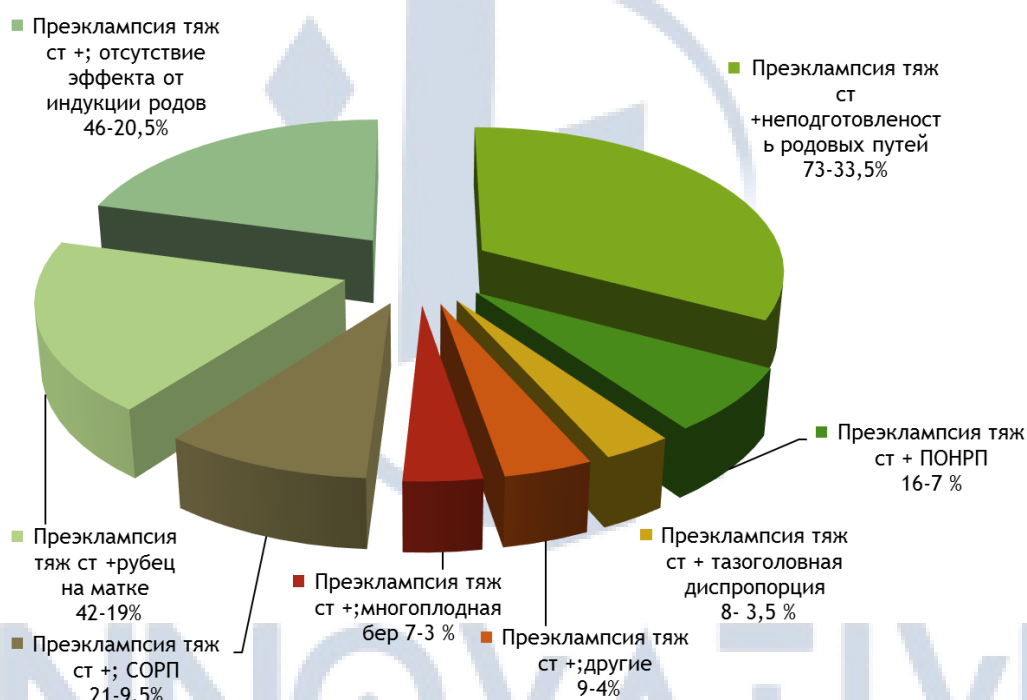


Рисунок №1 Показание к оперативному родоразрешению у женщин с тяжелой преэклампсией

Оперативные родоразрешение при преэклампсии тяжелой степени было у 222 (62%) рожениц. Показаниями к оперативным родоразрешением было следующие: Отсутствие эффекта от индукции родов у 46 (20,5%), неподготовленность родовых путей у 73 (33,5%) женщин, рубец на матке и преэклампсия тяжелой степени 42(19%), у 21(9.5%) беременных выявлено синдром отставание роста плода(СОРП) это тоже было показанием для оперативных родоразрешение со стороны плода, у 16 рожениц преэклампсия тяжелой степени осложнилась преждевременной отслойкой нормально расположенной плаценты (ПОНРП) что требовало urgentную лапаротомию.

Осложнения у матерей при тяжелой преэклампсии наблюдалось у 37(8.6%) женщин, из них преждевременная отслойка нормально расположенной плаценты 16(3.7%), Послеродовые кровотечения 14(3.6%) ДВС 3 (0.7%) Эклампсия 1 (0.2%) HELLP-синдром 2(0.46%).

Беременные с преэклампсией тяжелой степени все госпитализированы в реанимационное отделение. На фоне магнезиальной терапии развился приступ эклампсии у одной женщины. Также ПЭ тяжелой степени осложнилась HELLP синдромом у 2 женщин. После стабилизации состояния беременная родоразрешена путём операции кесарева сечения с перевязкой 2х пар сосудов. Во время операции развился ДВС синдром. Произведена гемо и плазматрансфузия. В послеродовом периоде продолжалась магнезиальная терапия (48 часов) и антигипертензивная терапия. Родильница через месяц выписана домой с ребёнком.

Вывод: учитывая данные ретроспективного анализа было выявлено что предрасполагающими факторами развития преэклампсии явилось различные соматические заболевания как анемия, заболевание почек, которые часто наблюдались в раннем репродуктивном возрасте. Наиболее частые осложнениями преэклампсии явилось ПОНРП, послеродовые кровотечения, ДВС и HELLP синдром. Из методов родоразрешения оперативные роды составили 62%, самостоятельные роды через естественные родовые пути 38.0%, наиболее частыми показаниями к оперативным родам были тяжелая преэклампсия при неподготовленности родовых путей, рубец на матке, СОРП и ПОНРП. Таким образом своевременное прогнозирование ранних осложнений во время беременности и в предгравидарном периоде приводит к уменьшению развития преэклампсии и его акушерских и перинатальных осложнений.

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DIABETIK TOVON SINDROMINI KOMPLEKS XIRURGIK DAVOLASH USULLARINI TAKOMILLASHTIRISH

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Annotatsiya: L-argininning uzoq muddatli arteriyalar ichiga kompleks davolashda qo'llash, pastki muchalarning ishemiyasi bilan patologik jarayonning rivojlanishi va oyoqdagi ishemiya holatlarining keskin pasayishiga olib keldi, bu bemorlarning atigi 10,2 foizida kuzatilgan. Bemorlar bir vaqtning o'zida yuqori tarkibni egallagan bo'lib, ushbu kompleks davolash usulidan foydalanmagan bemorlarda 30,7% ni tashkil etgan. Davolangan bemorlarda o'lim darajasi mos ravishda 4,54% va 13,18% ni tashkil etdi.

Kalit so'zlar: yiringli-nekrotik jarayon, diabetik tovon sindromi, pastki muchalar ishemiyasi.

Muvofiqlik. Pastki muchalarning ishemiyasi (PMI) bo'lgan bemorlarni davolashdagi yutuqlarga qaramay, bu muammo dolzarbligicha qolmoqda (3,16). Qandli diabet (QD) bilan og'rigan bemorlarda PMI taxminan besh marta tez-tez uchraydi va diabetik tovon sindromi bemorlarning 10% dan ko'prog'ida rivojlanadi. Ayniqsa og'ir diabetik tovon sindromining (DTS) PMI bilan birga keladigan yiringli-nekrotik asoratlari (4,15). Tadqiqotchilarning fikriga ko'ra, qandli diabet bilan og'rigan bemorlarda (PMI) diabetsez odamlarga qaraganda 40 marta tez-tez rivojlanadi (10,11,26,28,30,32,34,35).

Qandli diabet fonida pastki muchalarning ishemiyasi (PMI) bilan kechadigan yiringli-nekrotik jarayon jarohat holatini ham, kasallikning o'zi ham noqulay oqibatlariga olib keladi (9,12,13,14,17).

Pastki muchalarning ishemiyasi (PMI) patogenezi asosiy bo'g'in hisoblanadi. Endotelial disfunktsiya muammosi hozirgi vaqtda ko'plab tadqiqotchilarni o'ziga jalb qilmoqda, chunki u ateroskleroz, arterial gipertenziya, qandli diabet va pastki muchalar ishemiyasi (PMI) davrida qon tomir devoridagi morfologik o'zgarishlarga olib keluvchi omillardan biridir. Bu holda endotelial disfunktsiya, qoida tariqasida, tizimli xarakterga ega va nafaqat katta tomirlarda, balki kichik tomirlarda ham topiladi (8,27,29,31).

Ushbu toifadagi bemorlarni kompleks davolashga, jarrohlik davolash usullarini takomillashtirishga ko'plab urinishlarga qaramay, kasallikning natijasi ko'p hollarda yomon oqibatlariga olib keladi, ya'ni bemorlar pastki muchalarini yo'qotadilar (16,23,33,35). Operatsiyadan keyingi yiringli - nekrotik asoratlari va o'lim darajasi yuqori bo'lib, omon qolgan bemorlar jarrohlar uchun muvaffaqiyat deb hisoblanadi (5,8,15,20,21,22,24,25).

Patogenezi - ishemiya fonida mahalliy to'qimalar gipoksiyasi bo'lgan yiringli yallig'lanish kasalliklarini (YYK) davolashda fan va texnologiyaning rivojlanishi bilan antigipoksik preparatlarni (L-arginin) qo'llash bilan birlashtirilgan davolash usullari qo'llanila boshlandi. Ma'lumki, L-arginin antigipoksik, sitoprotektiv, antioksidant, intoksikatsiyaga qarshi va membranani rag'batlantiruvchi xususiyatlarga ega.

L-arginin ammiakni zararsizlantirish va uning tanadan chiqarilish jarayonlarini muhim rol o'ynashini isbotlandi. Azot oksidi donori sifatida L-arginin organizmni energiya bilan ta'minlash jarayonlarida ishtirok etadi, leykotsitlar va trombositlarning qon tomir endoteliasiga faollashishi va yopishishini pasaytiradi, aterosklerotik plakchalarining shakllanishiga, rivojlanishiga to'sqinlik qiladi va fibrinogenoliz jarayonlari tarkibiga kiradi. Preparat mo'tadil anabolik ta'sirga ega, ayrisimon bezining faoliyatini kuchaytiradi, insulin sintezini kuchaytirishga yordam beradi va jismoniy zo'riqishlar paytida qondagi glyukoza darajasini tartibga soladi va kislota-ishqor muvozanatini to'g'rilashga yordam beradi. Pastki muchalarning ishemiyasi, periferik tomirlarning aterosklerozi, diabetik angiopatiyani kompleks davolashda qo'llaniladi (1,5,35).

Diabetik tovon sindromining yiringli-nekrotik asoratlari bilan pastki muchalar tomirlarining endotelial disfunktsiyasining aniq belgilari bilan pastki muchalar ishemiyasida L-argininni qo'llashning ijobiy natijalari to'g'risidagi adabiyotlarda ma'lumotlar yara jarayonining kechishini o'rganish bilan bog'liq barcha fikrlarni to'liq aks ettirmaydi. Biroq, endotelial disfunktsiya bilan kechadigan ushbu patologiya bilan og'rigan bemorlarni kompleks davolashning eng maqbul usuli bo'yicha aniq tavsiyalar yo'q. Yuqoridagi muammolarni hal qilish bemorlarning ushbu guruhini davolashda faol ta'sir ko'rsatadi.

Tadqiqot maqsadi : Pastki muchalarning ishemiyasi bilan kechadigan qon tomir endotelial disfunktsiyasi bilan diabetik tovon sindromining yiringli-nekrotik asoratlarini davolashda L-argininni qo'llashning optimal usulini ishlab chiqish.

Materiallar va usullar: Ish 2017-2022 yillar davomida Buxoro ko'p tarmoqli tibbiyot markazining yiringli jarrohlik bo'limida davolangan pastki muchalarning ishemiyasi bilan kechadigan, qon tomir endotelial disfunktsiyaning aniq belgilari bilan birga bo'lgan, qandli diabet fonida pastki muchalarning yiringli-nekrotik shikastlanishi bo'lgan 272 bemorni jarrohlik davolash natijalarini ma'lumotlarini o'rganishga asoslanadi. Biz bemorlarni tabaqalashtirilgan randomizatsiya usulidan foydalandik. Tadqiqot maqsadlariga muvofiq barcha bemorlar shartli ravishda 3 guruhga bo'lingan: (I - nazorat va II a, II. b - asosiy). Bemorlar orasida erkaklar (69,5%) ustunlik qildi. Bemorlarning aksariyati 38 yoshdan 83 yoshgacha bo'lganlar. Birinchi nazorat guruhi 91 kishidan iborat (33,4%). Pastki muchalarning yiringli-nekrotik zararlanishi bo'lgan bemorlar, ular jarrohlik amaliyotini, antibiotik terapiyasi, infuzion, dezintoksikatsion terapiyasi, mikrosirkulyatsiyani

yaxshilaydigan dorilar - angioprotektorlar, glikemik tuzatishlarni o'z ichiga olgan terapevtik tadbirlar majmuasini o'tkazdilar. Shuningdek, qo'shma kasalliklarni simptomatik davolash amalga oshirildi. Mahalliy davolash an'anaviy usulda amalga oshirildi (suvda eruvchan polietilen glikol asosidagi malhamlar - oflomelid). II (a) guruhga 93 (34,2%) bemorlar kiritilgan bo'lib, ular an'anaviy davolash (antibakterial terapiya, antikoagulyantlar, mahalliy davolash (suvda eriydigan polietilen glikol asosidagi malhamlar - oflomelid)) bilan bir qatorda, mikrosirkulyatsiyani yaxshilash, pastki muchalarning qon tomirlarini endotelial disfunktsiyasini kamaytirish maqsadida kuniga bir marta vena ichiga L-arginin infuziyalari o'tkazildi. Chunki bu preparat antigipoksik va antioksidant xususiyatlarga ega.

II (b) guruhga 88 (32,4%) bemorlar kiritilgan bo'lib, ularda an'anaviy davolash (antibakterial terapiya, antikoagulyantlar, mahalliy davolash (suvda eriydigan polietilen glikol asosidagi malhamlar - oflomelid)) bilan bir qatorda, femoral arteriya kateterizatsiyasi orqali 24-48 soat davomida L-argininning uzoq muddatli arteriya ichi infuziyalari uzoq vaqt davomida amalga oshirildi. Dozator "aitecs® 2016" yordamida.

Tekshirilgan 272 bemorda oyoqdagi aniqlangan o'zgarishlar quyidagi shakllar bilan ifodalangan: o'choqli to'qimalar nekrozi - 35; oyoq barmoqlarining yiringli-nekrotik yaralari - 39; oyoqning yiringli-nekrotik flegmonasi - 51; oyoq barmoqlarining gangrenasi (quruq va nam) - 46; Oyoqning distal qismlarining ganrenlari (quruq va ho'l) - 73;. Oyoqning oraliq bo'shliq va boldir proliferatsiya qiluvchi chirigan flegmonalari, -28.

Jarrohlik bosqichi, iloji bo'lsa, bemorni to'liq tekshirish fonida, adekvat konservativ davo va zararlangan a'zoni tozalash bilan birgalikda amalga oshirildi. Bizning jarrohlik davolashimiz oyoqning to'qimalari va funktsiyalarini maksimal darajada saqlab qolish tamoyiliga asoslangan edi. Yiringli-nekrotik o'choqni jarrohlik davolash (YNO) paytida yiringli-nekrotik o'choqqa kengroq kirish ta'minlandi, uni yetarli darajada drenajlash amalga oshirildi, infektsiyani rivojlanishiga sabab bo'luvchi nekrotik to'qimalar olib tashlandi, komponentli suvda eriydigan polietilen glikol (PEG) asosidagi suvda eriydigan malham bintlarini qo'llash orqali bog'lamlar amalga oshirildi.

Tovon ust sohasi chuqur flegmonalari uchun biz barcha biriktiruvchi to'qima tuzilmalarini, fastsiyani, qalinlashgan, infektsiyalangan paylarini, Axilles payiga qadar kesib tashladik. Sog'lom to'qimalarda oyoq va oyoqning atipik, gilyotin amputatsiyasi ham amalga oshirildi.

Bemorlarni tekshirish umumiy klinik usullar, laboratoriya usullari, pastki muchalarning arterial o'zanini o'rganishning instrumental usullari (dopplerografiya, angiografiya), shuningdek immunologik parametrlarni o'rganish orqali endotelial disfunktsiyani baholash - endotelin 1 (ET-1), NO - azot oksidi, VEGF-A (Vascular endothelial growth factor) - qon tomir endotelial o'sish omili, TGF- β (transforming growth factor beta) - beta o'zgaruvchan o'sish omili. Barcha tekshirilgan bemorlar jarohat ekssudati bakteriologik tekshiruvdan o'tkazildi.

Jarohat holatining umumiy va mahalliy namoyon bo'lish dinamikasini baholash sub'ektiv mezonlarga (yara sekretsiasining tabiati, infiltratning rezorbsiyasi, granulyatsiya to'qimalari va epitelizatsiasining rivojlanish xususiyatlari) va ob'ektiv ko'rsatkichlarga (tana harorati, umumiy klinik qon tekshiruvi, leykotsitlar intoksikatsiya indeksi, prokalsitonin darajasi) muvofiq amalga oshirildi.

Natijalar va uning muhokamasi: I nazorat guruhiga kiritilgan 91 bemor bakterial floraning sezgiriligini inobatga olgan holda jarrohlik davolash va antibiotik terapiyasining asosiy tamoyillariga rioya qilgan holda, polietilen glikol (PEG) (oflomelid) asosidagi suvda eruvchan malham bilan mahalliy bog'lamlar oldi).

Qabul paytida bemorlarning umumiy ahvoli ko'p hollarda o'rtacha yoki og'ir edi. Ularning barchasi umumiy holsizlik, bezovtalik, pastki muchalarning patologik jarayoni sohasidagi og'riqlar, tana haroratining $37,8^{\circ} - 40,2^{\circ} \text{S}$ gacha ko'tarilishi, og'iz qurishi, uyqu buzilishi va ishtahasizlikdan shikoyat qildilar. Mahalliy simptomlar orasida oyoqdagi patologik jarayon atrofida terining o'rtacha yoki og'ir giperemiyasi va to'qimalarning shishishi mavjud edi. Palpatsiya yo'li bilan oyoqning jarohatlangan joylari barcha holatlarda, og'riqli va infiltratsiya holatlari aniqlandi va pastki muchalar istisnosiz, gipotermik edi, oyoq arteriyalarida pulsatsiya keskin zaiflashgan yoki umuman aniqlanmadi. Bemorlarning ko'pchiligi bizga kasallikning boshlanishidan va jarohat kursining birinchi bosqichidan keyin 3 dan 21 kungacha bo'lgan vaqt ichida qabul qilindi.

Tadqiqot guruhidagi bemorlarda jarohat tarkibidagi mikrofloraning tarkibini o'rganish tahlili shuni ko'rsatdiki, ko'p hollarda yara eksudati tarkibidagi aerob mikrofloraning vakillari stafilokokklar, ichak tayoqchalari va proteuslar, shuningdek, ekilgan anaeroblar orasida, *Pr.melaninogenica* va *Bacteroidesspp* ko'proq tarqalgan. Shu bilan birga, I guruhdagi bemorlarda yaralarning mikrob bilan ifloslanishining dastlabki darajasi o'rtacha 10^{10-11} mt / g ni tashkil qilganligini ko'rsatdi. Yarani malham surtib jarrohlik yo'li bilan davolashdan so'ng mikrobial ifloslanish 10^{-6} mt/g ni tashkil etgan bo'lsa, ertasi kuni 10^{7-8} mt / g gacha ko'tarilgan, kompleks davolash kursi bu bemorlarda 6-7 kun davomida bajarildi. Mikroblar bilan ifloslanish sezilarli darajada pasaya boshladi va o'rtacha 10^{5-6} mt / g ni tashkil etdi va faqat 10-12 kunlik davolashda u kritik darajadan past bo'lib, to'qimalar 1 g uchun 10^3 mikrob tanasini tashkil etdi.

Organizm intoksikatsiyasi ko'rsatkichlarini o'rganish shuni ko'rsatdiki, davolanishning birinchi kunida bemorlarda tana harorati o'rtacha $38,6 \pm 1,1^{\circ} \text{S}$. Qonda leykotsitlar miqdori o'rtacha $13,6 \pm 2,5 \times 10^9 / \text{l}$ bo'ldi.

Leykotsitlar intoksikatsiya indeksi (LII) va eritrotsitlar cho'kish tezligi (ECHT) mos ravishda $4,7 \pm 1,30$ va $40,2 \pm 1,6$ gacha ko'tarildi, PCT va CRB ko'rsatkichlari mos ravishda $1,2 \pm 0,2$ ng / ml va $16,5 \pm 2,1$ mg / l ni tashkil etdi. Davolanishning uchinchi kuni tana haroratining biroz pasayishi ($38,6 \pm 1,1^{\circ} \text{S}$ dan $37,9 \pm 0,5^{\circ} \text{C}$ gacha), qondagi leykotsitlar miqdori o'rtacha $11,0$

$20,5 \cdot 10^9 / l$ ga kamaydi. Davolashning uchinchi kunida LII ko'rsatkichlarining o'zgarishi $4,7 \pm 1,30$ dan $3,4 \pm 0,18$ birlikgacha pasayish belgilarini ko'rsatdi, ECHT esa o'rtacha $34,7 \pm 2,2$ mm / soatgacha kamaydi. Hozirgi kunda PCT va CRO ko'rsatkichlari mos ravishda 0,8 dan 0,1 ng/ml gacha va 12,1 dan 1,4 mg/l gacha bo'lgan. Davolashning 7-9 kunida nazorat guruhidagi tekshirilgan bemorlar biroz subfebril bo'lib qoldi ($37,0 \pm 0,4$ °S). Shu bilan birga, organizm intoksikatsiyasi ko'rsatkichlarining yanada pasayishi kuzatildi: qonda L, LII, ECHT, PCT va CRO, ya'ni normallashtirdi. Shunday qilib, davolanishning 12-14 kunida ECHTdani tashqari barcha tahlil qilingan intoksikatsiya ko'rsatkichlari normallashtirildi.

Dinamik tadqiqotlar natijalari endotelin a 1, NO va qon zardobidagi VEGF-A va TGF- β o'sish omillari nazorat guruhidagi bemorlarda qabul kunida endotelin 1 va NO ning boshlang'ich darajasi $9,22 \pm 0,64$ pg / ml va $16,32 \pm 1,12$ mkmol / l ni tashkil qilganligini ko'rsatdi. VEGF-A $1042,25 \pm 5$ pg / ml, TGF- β $187,74 \pm 2,5$ pg / ml. Doimiy davolanish fonida 3-kunga kelib endotelin 1 $7,82 \pm 0,57$ pg / ml ga, NO $18,64 \pm 1,44$ mkmol / l ga, VEGF-A ko'rsatkichlari esa $1154,27 \pm 5$ pg / ml ga, TGF- β $192,78 \pm 2,5$ pg / ml ga teng edi. 7-9 kunlarda ular (endotelin 1, NO, VEGF-A va TGF- β) $6,94 \pm 0,44$ pg / ml, $20,62 \pm 1,24$ mkmol / l, $1019,5 \pm 5$ pg / ml va $192,78 \pm 2,5$ pg / ml ni mos ravishda tashkil etdi. Davolanishning 12-14 kunida ham endotelin 1, NO, VEGF-A va TGF- β qiymatlari normal qiymatlardan yuqori bo'lib, $5,62 \pm 0,25$ pg/ml va $21,48 \pm 1,31$ mkmol / l, $609,5 \pm 5$ pg / ml va $172,54 \pm 2,5$ pg / ml ni tashkil etdi. (1-jadval).

1-jadval.

Nazorat guruhidagi (I) tekshirilgan bemorlarda qon zardobidagi endotelin 1, NO, VEGF-A va TGF- β indekslarining dinamikasi.

Ko'rsatkichlar	Davolash boshlanganidan beri			
	1 kun (qabul kuni)	3 kun	7-9 kunlar	12-14 kunlar
ET-1, pg / ml	$8,22 \pm 0,64$	$7,82 \pm 0,57$	$6,94 \pm 0,44$	$5,62 \pm 0,25$
YO'Q, mkmol / l	$16,32 \pm 1,12$	$18,64 \pm 1,44$	$20,62 \pm 1,24$	$21,48 \pm 1,31$
VEGF-A, pg / ml	$1042,25 \pm 5$	$1154,27 \pm 5$	$1019,5 \pm 5$	$609,5 \pm 5$
TGF- β , pg / ml	$192,78 \pm 2,5$	$192,78 \pm 2,5$	$192,78 \pm 2,5$	$172,54 \pm 2,5$

Shu bilan birga, nazorat guruhidagi bemorlarda jarohatdan infeksiyani tozalash o'rtacha $12,0 \pm 1,5$ kungacha sodir bo'ldi. 7-9 kun ichida jarohat atrofidagi infiltratning rezorbsiyasi qayd etildi. Granulyatsiyalar paydo bo'lishining boshlanishi davolashning 12-14 kunida va epitelizatsiya boshlanishi faqat 17-19 kun ichida qayd etildi. Shu bilan birga, statsionar davolanish muddati $21,5 \pm 2,5$ yotoq kunini tashkil etdi.

Kompleks chora-tadbirlar fonida nazorat guruhidagi 28 (30,7%) bemorda patologik jarayonning rivojlanishi va pastki muchalarning ishemiya

belgilari kuzatildi, bunda jarohat sababli 19 (20,8%) bemorda pastki oyoq amputatsiyasi amalga oshirildi. Pastki muchalarning yuqori uchdan bir qismi darajasida pastki oyoq amputatsiyasi va patologik jarayonga jalb qilinganligi sababli 10 (11%) holatda sonning o'rta va yuqori uchdan bir qismida yuqori amputatsiyalarga murojaat qilishga majbur bo'ldilar va sonning o'rta va yuqori uchdan bir qismi darajasida yuqori amputatsiyalar o'tkazildi. Pastki muchalarning kichik jarrohlik aralashuvini o'tkazgan 7 (7,69%) bemorlarda tuzatib bo'lmaydigan qo'shimcha kasalliklarning rivojlanishi kuzatildi va shuning uchun yuzaga kelgan: 3 nafar bemorda yurak-qon tomir faoliyatining o'tkir buzilishi, tizimli yallig'lanishli javob sindromi. 2 nafar bemorda septik shok va diabetik nefropatiya tufayli buyrak etishmovchiligi 2 nafar bemorda o'limga olib keldi. Femur va tibia darajasida yuqori amputatsiya qilingan nazorat guruhidagi bemorlarda operatsiyadan keyingi o'lim 5 (5,5%) bemorda kuzatildi. Operatsiyadan keyingi o'limning tuzilishini tahlil qilish shuni ko'rsatdiki, behushlik fonida 2 bemorda tananing hayotiy funktsiyalarining chuqur buzilishi bilan nazorat qilib bo'lmaydigan gipotenziya, 2 nafar bemorda o'pka emboliyasi va 1 nafar bemorda ko'p a'zolar etishmovchiligi belgilari kuchaygan. halokatli natijalar bilan kuzatildi. Ushbu guruhdagi umumiy o'lim soni 12 (13,18%) ni tashkil etdi.

Yuqorida ta'kidlab o'tilganidek, II asosiy guruh 2 kichik guruhga bo'lingan (IIa va IIb). II a guruhi 93 nafar bemordan iborat bo'lib, ular doimiy davolanishdan qo'shimcha ravishda kuniga bir marta L-arginin vena ichiga infuziyalari o'tkazilgan va II b guruhi 88 nafar bemordan iborat bo'lib, ular L-argininning femoral arteriya kateterizatsiyasi orqali uzoq muddatli arterial infuziyalaridan foydalanishdi. Asosiy guruhdagi bemorlarda, nazorat guruhidagi bemorlarda bo'lgani kabi, hajmi va tabiati bo'yicha taqqoslanadigan jarrohlik aralashuvlar o'tkazildi. Davolash paytida majburiy protsedura, standart tekshiruvdan tashqari, endotelial disfunktsiyani aniqlash uchun qon zardobida ET-1, NO, VEGF-A va TGF- β ni o'rganish edi.

Asosiy guruh bemorlarida to'qimalarining yara ekssudatidagi mikroblifloslanishini o'rganish shuni ko'rsatdiki, nazorat guruhidagi bemorlarda bo'lgani kabi yaralarning mikroblifloslanishining boshlang'ich darajasi 10^{9-10} mt / g ni tashkil etdi. Jarohatni jarrohlik yo'li bilan davolash va L argininni tomir ichiga yuborish boshlanganidan so'ng, nazorat guruhiga qaraganda jarohatlarning mikroblifloslanishining nisbiy pasayishi kuzatildi. III guruhida L argininning arterial ichi perfuziyalari amalga oshirildi, yaralarning mikroblifloslanishining sezilarli darajada pasayishi kuzatildi va davolanishning 3-kuniga kelib u o'rtacha 10^{5-6} mt / g ni tashkil etdi va davolanishning 7-9-kuniga kelib jarohatdagi mikroblifloslanish o'rtacha 1 g ga 10^3 to'qimalardagi infeksiya kamaydi.

IIa va IIb guruhidagi bemorlarda endotoksikoz darajasini tahlil qilish shuni ko'rsatdiki, davolanishning uchinchi kunida tana harorati pasaygan (IIa da $38,8 \pm 1,1$ °S dan $38,1 \pm 0,7$ °C gacha, IIb $39,2 \pm 1,1$ °S dan $37,4 \pm 0,3$ °S gacha).), qondagi leykotsitlar miqdori IIa guruhda o'rtacha $12,5 \pm 1,0 \cdot 10^9$ /l

ga, IIb $8,7 \pm 1,0 \cdot 10^{-9}$ /l gacha kamaygan. Uchinchi kuni LII ko'rsatkichlarining o'zgarishi IIa da $4,8 \pm 1,30$ dan $4,4 \pm 0,22$ birlikgacha, IIb da $4,9 \pm 1,35$ dan $3,2 \pm 0,24$ birlikgacha, ECHT har ikkala guruhda o'rtacha $31,5 \pm 1,8$ mm / soat va 252 ± 1 mm / s gacha mos ravishda kamaydi. Va PCT va CRP ko'rsatkichlari II guruhda $1,25 \pm 0,24$ ng / ml dan $1,02 \pm 0,2$ ng / ml gacha va $15,9 \pm 2,1$ mg / l dan $13,2 \pm 1,1$ mg / l gacha, II b guruhida $1,26 \pm 0,23$ ng / ml dan $0,52 \pm 0,1$ ng / ml gacha va $15,4 \pm 2,2$ mg/l dan $9,4 \pm 1,1$ mg/l gacha kamaydi. Davolanishning 7-9 kunida II a guruhidagi tekshirilgan bemorlarda organizm intoksikatsiyasining ko'rsatkichlari me'yoridan yuqori bo'lgan: LII, ECHT, PCT va qon CRP; I va II a guruhlaridagi bemorlariga qaraganda II b guruhidagi bemorlardagi normallashtirish kuzatildi.

NO va o'sish omillari VEGF-A va TGF- β dinamikasini o'rganish natijalari shuni ko'rsatdiki, IIa guruhidagi bemorlarda qabul qilingan kunida ET-1 ning boshlang'ich darajasi $8,94 \pm 0,44$ pg / ml, ni tashkil etdi. NO $16,32 \pm 1,12$ mkmol / l, VEGF-A $1054,27 \pm 5$ pg / ml, TGF- β $190,56 \pm 2,5$ pg / ml edi. L -argininni tomir ichiga yuborish boshlangandan so'ng, nazorat guruhiga nisbatan ET-1, NO, VEGF-A va TGF- β da biroz yaxshilanish kuzatildi. Vena ichiga L -arginin bilan kompleks davolash fonida 3-kunga kelib ET-1 $7,82 \pm 0,38$ pg/ml, NO $18,64 \pm 1,44$ mkmol / l, VEGF - A $922,20 \pm 5$ pg / l ml, TG- β $16-5,4 \pm 2,5$ pg / ml ni tashkil etdi. 7-9 kunlarda ular mos ravishda $5,80 \pm 0,42$ pg / ml, $21,66 \pm 1,22$ mkmol / l, $504,5 \pm 5$ pg / ml va $130,57 \pm 2,5$ pg / ml ni tashkil etdi. Va davolanishning 12-14 kunida bu belgilarning ko'rsatkichlari deyarli normal chegaralarga yetdi (2-jadval).

2-jadval.

IIa guruhi tekshirilgan bemorlarda qon zardobidagi endotelin 1, NO, VEGF-A va TGF- β indekslarining dinamikasi.

Ko'rsatkichlar	kun			
	Qabul kuni leniya	3	7-9	12-14
ET-1, pg / ml	$8,94 \pm 0,44$	$7,82 \pm 0,38$	$5,80 \pm 0,42$	$4,24 \pm 0,25$
YO'Q, mkmol / l	$16,32 \pm 1,12$	$18,64 \pm 1,44$	$21,66 \pm 1,22$	$25,84 \pm 1,33$
VEGF-A, pg / ml	$1054,27 \pm 5$	$922,20 \pm 5$	$504,5 \pm 5$	$340,45 \pm 5$
TGF- β , pg / ml	$190,56 \pm 2,5$	$165,44 \pm 2,5$	$130,57 \pm 2,5$	$118,78 \pm 2,5$

L -argininning uzoq muddatli perfuziyasi uchun arterial kateter o'rnatilgan bemorlarning II b guruhini o'rganish natijalari ET-1, NO, VEGF-A va TGF- β ning tez yaxshilanishini ko'rsatdi. L -argininning arterial ichi perfuziyasi yordamida kompleks davolash fonida, 3-kuni ET-1, NO $7,04 \pm 0,36$ pg / ml, $19,62 \pm 1,44$ mkmol / l, VEGF-A esa $842,24 \pm 5$ pg/ml, ga teng edi. TGF- β $160,44 \pm 2,5$ pg/ml, 7-9 kunlarda ular $4,87 \pm 0,48$ pg/ml, $24,88 \pm 1,28$ mkmol / l, $524,5 \pm 5$ pg/ml va $124,72 \pm 2,5$ pg/ml, ni mos ravishda tashkil etdi. Davolanishning 12-14 kunida ET-1, NO, VEGF-A va TGF- β ko'rsatkichlari normaga yetdi. (3-jadval).

3-jadval.

II b guruhi tekshirilgan bemorlarda qon zardobidagi endotelin 1, NO ,
VEGF-A va TGF- β ning dinamikasi .

Ko'rsatkichlar	kun			
	Qabul kuni leniya	3	7-9	12-14
ET-1, pg /ml	9,24 $\pm$ 0,35	7,04 $\pm$ 0,36 _	4,87 $\pm$ 0,48	3,22 $\pm$ 0,22
YO'Q , mkmol / l	16,33 $\pm$ 1,10	19,62 $\pm$ 1,44 _	24,88 $\pm$ 1,28	27,94 $\pm$ 1,66
VEGF-A, pg /ml	1066,27 $\pm$ 5	842,24 $\pm$ 5	524,5 $\pm$ 5	240,45 $\pm$ 5
TGF- β , pg /ml	194,23 $\pm$ 2,5	160,44 $\pm$ 2,5	124,72 $\pm$ 2,5	98,78 $\pm$ 2,5

Tahlil qilingan guruhdagi bemorlarda (II a va II b) infektsiyadan yaralarni tozalash o'rtacha 9,0 $\pm$ 1,0 va 5,0 $\pm$ 1,0 kunlarda sodir bo'ldi va bunga parallel ravishda yara atrofidagi infiltratning rezorbsiyasi qayd etildi. Granulyatsiyalar paydo bo'lishining boshlanishi II a guruhida 10-11 kunlarda, II b guruhida esa 7-8 kunlarda qayd etilgan. Epitelizatsiya boshlanishi II a guruhida davolashning 14-15 kunida, II b guruhida 10-11 kunni tashkil etdi . Shu bilan birga, statsionar davolanish muddati mos ravishda 16,5 $\pm$ 1,5 va 11,5 $\pm$ 1,5 yotoq kunini tashkil etdi.

Majmua chora-tadbirlari fonida, pastki muchalarning yiringli-nekrotik shikastlanishlari chuqurligi tufayli, II guruhdagi 16 (17,2%) bemorlarda patologik jarayonning rivojlanishi va pastki muchalarning ishemik belgilari rivojlanishi qayd etildi, bemorlarning sog'ligini yaxshilash maqsadida jarohatlanish sabablarga ko'ra, 9 nafar (9,67%) bemor oyoqning boldir pastki va yuqorigi uchdan bir qismi darajasida amputatsiya operatsiya qilingan, 7 (7,53%) holatda esa ular sonning o'rta va yuqori uchdan bir qismida yuqori amputatsiyalarga murojaat qilishga majbur bo'ldi. Oyoqning boldir qismida kichik jarrohlik aralashuvini o'tkazgan 5 nafar (5,37%) bemorlarda ko'p a'zolar etishmovchiligining rivojlanishi kuzatildi , bu esa o'limga olib keldi. Oyoqning son va boldir qismida yuqori amputatsiya qilingan II guruh bemorlarida operatsiyadan keyingi o'lim ko'rsatkichi 4 (4,3%) bo'lib, ikkita holatda o'pka emboliyasi, va o'tkir yurak-qon tomir etishmovchiligi sabab bo'lgan . Ushbu guruhdagi umumiy 9 (9,67%) ta o'lim sonini tashkil etdi.

II b guruhidagi pastki muchalarning yiringli-nekrotik shikastlanishi chuqurligi tufayli bemorlarning 9 nafari (10,2%) patologik jarayoni va pastki muchalarning ishemiyasi belgilarining rivojlanishi qayd etildi, bunda bemorlarning 5 tasi (5,68%) da hayot ko'rsatkichlari bo'yicha operatsiya o'tkazildi. Pastki muchalarning yuqori uchdan bir qismi darajasida amputatsiya qilingan 4 nafar (4,54%) bemorlarning sonning o'rta va yuqori uchdan bir qismida yuqori amputatsiyani amalga oshirishga majbur bo'lgan. Pastki muchalarning kichik jarrohlik aralashuvlar o'tkazilgan bemorlarning 2 nafarida (2,27%) ko'p a'zolar yetishmovchiligining rivojlanishi kuzatildi, bu esa o'limga olib keldi. Operatsiyadan keyingi o'lim darajasi II b guruhidagi

bemorlarda son va pastki oyoq muchalari yuqori amputatsiya qilingan 2 nafar bemorlarni (2,27%) tashkil etdi. Buning sababi ikkala holatda ham o'pka emboliyasi edi. Ushbu guruhdagi umumiy o'lim 4 nafar (4,54%) bemorni tashkil etdi.

II a va II b guruhlardagi bemorlarni kompleks davolashning qiyosiy tahlili shuni ko'rsatdiki, agar nazorat va II guruh bemorlarida yaralarning mikroblifiloslanishi ancha uzoq vaqt va faqat 9 va 10-kunlarda davom etsa, davolanish kunlarida bu ko'rsatkich mos ravishda kritik darajadan pastga tushdi, davolash kompleksining bir qismi sifatida L -argininning intraarterial infuziyalarini olgan bemorlarda davolashning 7-9-kunlarida yaradagi mikrobial ifiloslanish pasaydi. Nazorat guruhidagi bemorlarda , hatto davolanishning 12-14 kunida ham, ET-1, NO (azot oksidi), VEGF-A va TGF- β ning sezilarli darajada normallasishi kuzatilmadi ($5,62 \pm 0,25$ pg / ml va $21,48 \pm 1,31$) mkmol/l, $609,5 \pm 5$ pg /ml va $172,54 \pm 2,5$ pg /ml), mos ravishda. Asosiy II b guruhidagi bemorlarda ko'rsatkichlarning normallasuvi belgilangan omillardan yuqori ekanligi kuzatildi.

Qandli diabet va pastki muchalarning ishemiyasi fonida pastki muchalarning yiringli-nekrotik zararlanishi bo'lgan bemorlarni kompleks davolashda L-argininning arteriya ichida infuziyalaridan foydalanish 4-5 kunlarda yarani infektsiyadan to'liq tozalashga yordam berdi. Bu vaqtga kelib yara atrofidagi infiltratning faol rezorbsiyasi kuzatildi. Davolashning 7-8 kunida granulyatsiya, 10-11 kunida epitelizatsiya boshlanadi. Tadqiqotlar shuni ko'rsatdiki, II b guruhida I va IIa guruhlariga nisbatan 4-5 kun ichida ushbu ko'rsatkichlarning sezilarli o'sishi, shu bilan birga davolanishning o'rtacha davomiyligi $21,5 \pm 2,5$ dan $11,5 \pm 1,5$ yotoq kunigacha kamaydi. II b asosiy guruhdagi bemorlarda L -argininning arteriyalar ichiga infuziyalarini kompleks davolashda qo'llash patologik jarayonning rivojlanishi va ishemiya holatlarining keskin kamayishiga olib keldi, bu faqat 9 nafar bemorda (10,2%) kuzatilgan. Bemorlar nazorat guruhida I va II guruhida kattaroq va mos ravishda bo'lgan 28 (30,7%) tashkil qilsa , 16 nafar (17,2%), bemorda pastki oyoq va sonning yuqori uchdan bir qismi darajasida amputatsiya qilingan. Kompleks davolash chora-tadbirlari amalga oshirilganiga qaramay, nazorat guruhidagi bemorlarda o'lim darajasi 13,18%, ni tashkil etdi, II a guruhlarda 9 (9,67%), asosiy guruhdagi bemorlarda esa o'lim soni keskin kamaygan bu davolangan bemorlarning umumiy sonining 4 nafari (4,54%) ni tashkil etdi.

Diabetik oyoq sindromi bilan kasallangan bemorlarda ishemiyani davolashda L -argininni qo'llashning optimal usulini taklif qilish imkonini beradi. L -argininning uzoq muddatli arteriyalar ichi infuziyalari yordamida kompleks davolashning tavsiya etilgan usuli pastki muchalarning ishemiya belgilarini tezda yo'q qilishga imkon berdi, oyoqdagi patologik jarayonning rivojlanishini kamaytirishga majburiy amputatsiyalar va o'limni kamaytirishga yordam berdi. Yuqorida aytilganlarning barchasi hayot sifatining oshishi bilan davolash natijalarining yaxshilanishini, shuningdek, ushbu bemorlarning normal mehnat faoliyatiga qaytishini ko'rsatdi.

Xulosa.

1. Diabetik tovon sindromini pastki muchalarning ishemiyasi bilan davolashning an'anaviy usullari bilan yarani infektsiyadan tozalash, davolash jarayonlari va normal et-1, NO (azot oksidi), VEGF-A va TGF- β ko'rsatkichlarini tiklash yetarli darajada tez sodir bo'lmaydi. Statsionar davolanishning davomiyligi $21,5 \pm 2,5$ yotoq kunini tashkil qiladi.

2. Kompleks davolash pastki muchalar tomirlarining og'ir endotelial disfunktsiyasini tuzatuvchi maqsadli chora-tadbirlarni o'z ichiga olishi kerak, bu ta'sirlangan pastki muchalarning gipoksiya va ishemiyasi bilan birga keladi.

L -arginin perfuziyasi bilan uzoq muddatli intraarterial terapiyadan foydalanish 24-48 soat ichida diabetik tovon sindromini pastki muchalarning ishemiyasi bilan kompleks davolashda ta'sirlangan pastki muchalarning to'qimalarida yaxshilangan reparativ jarayonlar bilan qon tomir endotelial disfunktsiyani bartaraf etishga yordam beradi.

L -argininning perfuziyasi yaralarni infektsiyadan tozalash uchun zarur bo'lgan vaqtni 4-5 kunga tezlashtirishga yordam berdi, pastki muchalarning yiringli-nekrotik jarayonlarining rivojlanishini kamaytiradi, bu esa o'z navbatida majburiy yuqori amputatsiyalar sonining 11% dan 4,54% gacha pasayishiga va o'limning 13,18% dan 4,54% gacha pasayishiga olib keldi.

L -argininni qo'llash uchun ko'rsatmalar pastki muchalar ishemiyasini aniq belgilarining mavjudligi, qon tomir endotelial disfunktsiyaning og'irligini baholashning ishonchli mezonlari ET-1, NO (azot oksidi), VEGF-A va TGF- β hisoblanadi.

6. L -arginindan foydalanishning tavsiya etilgan usuli diabetik tovon sindromini davolashda yuqori ijtimoiy ahamiyatga ega, bu davolash natijalarini yaxshilash, hayot sifatini yaxshilash va ushbu toifadagi bemorlarning mehnat qobiliyatini erta tiklashdan iborat.

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AMIR TEMUR TUZUKLARIDA BIOXILMAXILLIK MAVZUSI

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Annotatsiya. Ushbu maqolada "Temur tuzuklari" tarixiy asarida tilga olingan hududlarning biologik xilma-xilligi haqidagi ma'lumotlar yoritilgan. Amir Temurning "Temur tuzuklari" asarida bevosita bioxilmaxillik haqida ma'lumot berilmagan bo'lsa-da, uning davlat siyosati va qoidalari tabiat muhofazasiga, turli o'simlik va hayvon turlarining yashash muhitini asrashga xizmat qilgan.

Kalit so'zlar. Temur tuzuklari, bioxilmaxillik, tabiat, yer, tuproq

Kirish. Amir Temur o'zining mashhur "Temur tuzuklari" asarida davlat boshqaruvi, qonunlar, harbiy yurishlar va odil hukm haqida muhim ko'rsatmalar bergan. Garchi u bioxilmaxillik yoki ekologiya kabi zamonaviy tushunchalarni to'g'ridan-to'g'ri tilga olmagan bo'lsa-da, uning siyosati va amaliyotlari tabiiy muhitni asrab-avaylash, turli ekotizimlarni muhofaza qilish va qishloq xo'jaligini rivojlantirishga bevosita ta'sir qilgan.

Asosiy qism

1. Tabiatga va Yerga Nisbatan Mas'uliyat

Amir Temur o'z davlatini barqaror va mustahkam qilish uchun yerga, suvga va tabiiy boyliklarga e'tibor qaratgan. "Tuzuklar"da davlat rahbarining vazifalaridan biri yerlarni obodonlashtirish va sug'orish tizimlarini yaxshilash ekanligi ta'kidlanadi. Bu tamoyillar bioxilmaxillikni asrash uchun ham muhim hisoblanadi, chunki sog'lom ekotizimlar va unumdor yerlar turli o'simlik hamda hayvon turlarining yashashi uchun qulay muhit yaratadi.

2. Qishloq Xo'jaligini Rivojlantirish va Uning Ekologik Ahamiyati

Temur o'z imperiyasida qishloq xo'jaligini rivojlantirishga katta e'tibor bergan. U dehqonlar uchun qulay sharoit yaratish, yerlarni sug'orish tizimlarini yaxshilash va ekinlarning hosildorligini oshirish bo'yicha farmonlar bergan. Bu nafaqat iqtisodiy rivojlanishga, balki bioxilmaxillikning saqlanishiga ham ijobiy ta'sir ko'rsatgan.

Qishloq xo'jaligining barqaror rivojlanishi:

Turli xil ekinlarni yetishtirish orqali tuproq unumdorligini saqlash;
Sug'orish tizimlarini rivojlantirish orqali o'simliklar va suv ekotizimlarini qo'llab-quvvatlash;

Chorvachilikni tartib bilan rivojlantirish orqali tabiiy yaylovlarning me'yorda ishlatilishini ta'minlash.

Bu siyosat tufayli Amir Temur davrida turli ekotizimlar saqlanib qolgan va insonlar bilan tabiat o'rtasida muvozanat yaratilgan.

3. Harbiy Yurishlar Va Ekotizimga Ta'sir

Temurning harbiy yurishlari ko'pincha yirik hududlarni egallash bilan bog'liq bo'lgan. Biroq, u bosib olingan joylarda tartib o'rnatish, shaharlarni tiklash va qishloq xo'jaligini rivojlantirishga katta e'tibor bergan. Uning qo'shinlari yurishlar davomida:

Suv manbalarini iflos qilmaslik;

O'rmon va bog'larni behuda yo'q qilmaslik;

Qishloq xo'jaligi yerlari va bog'larni asrab-avaylash haqida buyruqlar olgan.

Bu tamoyillar Temurning tabiatni hurmat qilish siyosatini aks ettiradi va bioxilmaxillikni saqlashga xizmat qilgan.

4. Bog'lar va Yashil Hududlarni Barpo Etish

Amir Temur Samarqand, Shahrisabz va boshqa shaharlarda ko'plab bog'lar, xiyobonlar va yashil hududlar barpo etgan. Bu bog'lar quyidagi jihatlari bilan ekologik muhitga ijobiy ta'sir ko'rsatgan:

Havo sifatini yaxshilash;

Quyi ekologik zanjirda turuvchi hasharotlar, qushlar va boshqa jonzoatlarning yashash joylarini yaratish;

O'simliklarning xilma-xilligini saqlash va ko'paytirish.

Masalan, Samarqanddagi mashhur bog'lar nafaqat shaharning go'zalligi uchun, balki turli xil o'simlik va hayvon turlarining yashash joyi sifatida ham muhim rol o'ynagan.

5. Suv Resurslaridan Foydalanish Siyosati

Temur o'z davlati hududida suv resurslarini samarali boshqarishga katta e'tibor bergan. U yangi ariqlar qazdirib, daryolar bo'yida sug'orish tizimlarini yaxshilagan. Bu esa:

Ekotizimlar barqarorligini saqlash;

Dehqonchilik va bog'dorchilikni rivojlantirish;

Suv hayvonlari va qushlar yashash muhitini saqlashga yordam bergan.

Xulosa. Amir Temurning "Temur tuzuklari" asarida bevosita bioxilmaxillik haqida ma'lumot berilmagan bo'lsa-da, uning davlat siyosati va qoidalari tabiat muhofazasiga, turli o'simlik va hayvon turlarining yashash muhitini asrashga xizmat qilgan.

Uning tabiatga bo'lgan e'tibori quyidagi asosiy jihatlar bilan bog'liq:

-Qishloq xo'jaligini rivojlantirish orqali bioxilmaxillikni qo'llab-quvvatlash;

-Shahar va qishloqlarda yashil hududlarni kengaytirish;

-Harbiy yurishlar paytida tabiiy resurslarni saqlashga harakat qilish;

-Suv resurslarini samarali boshqarish va ekotizimni qo'llab-quvvatlash.

Bugungi kunda ekologik muammolarni hal qilishda Amir Temur siyosati va uning tabiatga bo'lgan munosabati muhim tajriba sifatida baholanishi mumkin.

Foydalanilgan adabiyotlar

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CHARACTERISTIC EEG PATTERNS IN SSPE AND THEIR CORRELATION WITH CLINICAL STAGES

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Abstract: Subacute Sclerosing Panencephalitis (SSPE) is a progressive neurological disorder caused by persistent measles virus infection. Electroencephalography (EEG) is a crucial diagnostic tool that reflects the disease's progression through distinct patterns at each clinical stage. In early SSPE (Stage I), EEG may show normal activity or mild background slowing. As the disease advances (Stage II), periodic high-amplitude delta wave complexes synchronized with myoclonic jerks emerge. Stage III is characterized by more frequent and disorganized periodic complexes, including sharp and slow wave discharges. In the final stage (Stage IV), EEG findings deteriorate to burst-suppression patterns or a flatline, indicating severe neuronal damage. Recognizing these EEG features is essential for timely diagnosis and disease monitoring.

Keywords: subacute sclerosing panencephalitis, EEG, periodic complexes, myoclonus, burst-suppression pattern

INTRODUCTION

Subacute sclerosing panencephalitis (SSPE) is a rare, progressive, and fatal neurodegenerative disorder caused by a persistent measles virus infection. The disease is characterized by distinct clinical stages, and electroencephalographic (EEG) findings play a crucial role in diagnosing and monitoring its progression. This section explores the characteristic EEG patterns observed in SSPE patients and their correlation with the clinical stages of the disease.

Characteristic EEG Patterns in SSPE

The EEG findings in SSPE are highly distinctive and often serve as a key diagnostic tool. The most common EEG feature is the presence of periodic high-amplitude delta wave complexes, which are typically bilateral, symmetrical, and bisynchronous. These complexes recur at regular intervals, often every 5-7 seconds, and are sometimes referred to as "Radermecker complexes" (Omkar N. Markand & Jose G. Panszi, 1975; Saad Ali et al., 2021). In addition to these periodic complexes, other EEG abnormalities include diffuse slowing of background activity, sharp and slow wave discharges, and focal epileptiform discharges. These findings are not exclusive to SSPE but are

highly suggestive when combined with clinical features such as myoclonus and elevated measles antibody titers in the cerebrospinal fluid (CSF) (Candan Gürses et al., 2000; G A Khwaja et al., 1991; Omkar N. Markand & Jose G. Panszi, 1975).

Atypical EEG patterns have also been reported in some cases. For instance, periodic lateralized epileptiform discharges (PLEDs) and burst-suppression activity may occur, particularly in the terminal stages of the disease (Délrio F. Silva et al., 1995; Umberto Aguglia et al., 1987). Furthermore, some patients may exhibit frontal rhythmic delta activity or paroxysms of bisynchronous spike-wave activity, which can complicate the interpretation of EEG findings (Iliyana Aleksandrova et al., 2021; Omkar N. Markand & Jose G. Panszi, 1975).

Correlation of EEG Findings with Clinical Stages of SSPE

SSPE progresses through several clinical stages, and the EEG findings often reflect the disease's evolution. The clinical stages of SSPE can be broadly categorized as follows:

Stage I: This is the early stage, characterized by non-specific symptoms such as cognitive decline, behavioral changes, and mild neurological deficits. EEG findings at this stage may still be normal or show subtle abnormalities, such as mild slowing of background activity.

Stage II: This stage is marked by the onset of myoclonus, seizures, and more pronounced neurological deficits. The EEG during this stage typically shows the emergence of periodic high-amplitude delta wave complexes, which are a hallmark of SSPE. These complexes are often synchronized with myoclonic jerks, creating a one-to-one relationship between the clinical and EEG phenomena (Michael A. Sisk & John F. Griffith, 1974; Saad Ali et al., 2021).

Stage III: In this advanced stage, patients experience significant neurological deterioration, including visual disturbances, pyramidal and extrapyramidal signs, and cognitive decline. The EEG during this stage may show more frequent and disorganized periodic complexes, along with other abnormalities such as sharp and slow wave discharges and focal epileptiform discharges (Candan Gürses et al., 2000; G A Khwaja et al., 1991).

Stage IV: This is the terminal stage, characterized by a vegetative state, cortical blindness, and complete loss of voluntary movements. The EEG in this stage often shows burst-suppression activity or a flatline pattern, indicating severe cortical damage and loss of brain function (Tatsuo Ohya et al., 1974; Umberto Aguglia et al., 1987).

Table 1. EEG Changes Across Clinical Stages of SSPE

Clinical Stage	EEG Findings	Citation
Stage I	Normal or subtle slowing of background activity	(Sisk & Griffith, 1974) (Ali et al., 2021)

Stage II	Emergence of periodic high-amplitude delta wave complexes synchronized with myoclonus	(Markand & Panszi, 1975) (Ser et al., 2021)
Stage III	More frequent and disorganized periodic complexes, sharp and slow wave discharges	(Gürses et al., 2000) (Khwaja et al., 1991)
Stage IV	Burst-suppression activity or flatline pattern	(Ohya et al., 1974) (Aguglia et al., 1987)

Variability in EEG Patterns

While the periodic high-amplitude delta wave complexes are the most characteristic EEG feature of SSPE, there is considerable variability in the presentation of EEG patterns. Some patients may exhibit atypical EEG patterns, such as periodic polyspiking discharges or triphasic slow waves, particularly in the early or terminal stages of the disease (Délrio F. Silva et al., 1995; Iliyana Aleksandrova et al., 2021). Additionally, the morphology and frequency of the periodic complexes may vary between patients and even within the same patient over time (Jiang-tao Wang et al., 2022; Saad Ali et al., 2021).

Clinical Implications of EEG Findings

The EEG findings in SSPE are not only diagnostic but also provide valuable insights into the disease's progression and prognosis. The presence of periodic high-amplitude delta wave complexes is strongly associated with the clinical stages of SSPE, particularly stages II and III. These complexes often correlate with the severity of myoclonus and other neurological symptoms (Merve Hazal Ser et al., 2021; Omkar N. Markand & Jose G. Panszi, 1975). Furthermore, the evolution of EEG patterns over time can help clinicians monitor the disease's progression and assess the effectiveness of any therapeutic interventions (Christian Hertel Wulff, 1982; Tatsuo Ohya et al., 1974).

CONCLUSION

In conclusion, the EEG findings in SSPE are highly characteristic and play a critical role in the diagnosis and monitoring of the disease. The periodic high-amplitude delta wave complexes are the hallmark EEG feature of SSPE and are strongly correlated with the clinical stages of the disease. While there is some variability in the presentation of EEG patterns, the presence of these complexes, combined with clinical features such as myoclonus and elevated measles antibody titers in the CSF, is highly suggestive of SSPE. Further research is needed to explore the relationship between EEG findings and the underlying neuropathological changes in SSPE.

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COMPREHENSIVE REVIEW ARTICLE: POSTOPERATIVE DELIRIUM AFTER CABG

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Abstract. Postoperative delirium (POD) following coronary artery bypass graft (CABG) surgery represents a significant clinical challenge, characterized by acute, fluctuating disturbances in attention, awareness, and cognition. This review synthesizes current evidence on its definition, incidence, risk factors, pathophysiology, prevention, management, and outcomes, with a focus on integrating findings from recent scientific literature and adhering to APA citation style.

Keywords: delirium, surgery, risk factors, pathophysiology, diagnosis, management.

Introduction

POD is defined as an acute, fluctuating disturbance in attention and awareness, accompanied by changes in cognition, such as memory deficits or disorientation, that develops shortly after surgery and is not better explained by pre-existing dementia. The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), provides the gold standard for diagnosis, requiring evidence of disturbance in consciousness with reduced ability to focus, maintain, or shift attention, alongside cognitive changes that develop over hours to days and fluctuate during the day [6]. This aligns with clinical assessments commonly used in postoperative settings, such as the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU).

Incidence

The incidence of POD after CABG varies significantly across studies, reflecting differences in patient populations, surgical techniques, and diagnostic methods. A large cohort study of 5,034 CABG patients reported an incidence of 6%, while other research suggests a range from 4.1% to 54.9% in cardiac surgery patients, including CABG, indicating the broad variability [7][8]. This wide range underscores the need for standardized assessment protocols to enhance comparability across studies.

Risk Factors

Risk factors for POD after CABG are categorized into preoperative, intraoperative, and postoperative factors, each contributing to the likelihood of developing delirium.

Preoperative Risk Factors

Age: Older age is consistently identified as a significant risk factor, with higher incidence in patients over 65 years [9].

Cognitive Impairment: Pre-existing mild cognitive impairment or dementia increases vulnerability [10].

Comorbidities: Conditions such as diabetes, hypertension, and carotid artery stenosis are associated with increased risk [11].

Psychiatric History: Preoperative depression and substance abuse, including alcohol or psychoactive medication use, elevate risk [12].

Functional Status: Patients with New York Heart Association (NYHA) functional class III or IV, indicating severe heart failure, are at higher risk [13].

Intraoperative Risk Factors

Cardiopulmonary Bypass (CPB) Duration: Longer CPB times, often linked to surgical complexity, are associated with increased delirium risk, though findings are inconsistent [14].

Anesthesia Management: Depth of anesthesia, monitored via bispectral index (BIS), with prolonged EEG burst suppression or values below 20, increases odds of delirium [15].

Cerebral Oximetry: Lower preoperative cerebral oxygen saturation or intraoperative desaturation below 50% is linked to higher delirium rates [16].

Surgical Technique: While no significant difference is found between on-pump and off-pump CABG for delirium incidence, complex procedures like valve surgery show higher rates [17].

Postoperative Risk Factors

Mechanical Ventilation: Prolonged ventilation, especially beyond 24 hours, is associated with increased delirium risk [18].

Medications: Use of benzodiazepines, steroids, and calcineurin inhibitors postoperatively can precipitate delirium, particularly in elderly patients [19].

Complications: Postoperative stroke, acute kidney injury, and the need for transfusions are significant risk factors [20].

ICU Environment: Factors such as sleep deprivation, immobility, and physical restraints in the ICU contribute to delirium risk [21].

The following table summarizes key risk factors, categorized by timing:

Category	Risk Factors	Notes
Preoperative	Age, cognitive impairment, diabetes, depression, carotid stenosis, NYHA class III/IV	Older age and cognitive issues significantly increase risk.
Intraoperative	CPB duration, anesthesia depth, cerebral desaturation, surgical complexity	Longer CPB and low oxygen levels during surgery are critical.
Postoperative	Prolonged ventilation, medication use, stroke, AKI, ICU factors	Postoperative complications and ICU environment play a major role.

Pathophysiology

The pathophysiology of POD after CABG is multifactorial, involving systemic inflammation, cerebral hypoperfusion, neurotransmitter imbalances, and potential embolic events. Surgical trauma induces a systemic inflammatory response, leading to leukocyte adhesion, endothelial swelling, and perivascular edema, which impair microcirculation and reduce nutritive perfusion [22]. This hypoxia particularly affects acetylcholine synthesis, which is highly sensitive to low oxygen tension, contributing to cognitive disturbances [23]. During CABG, cardiopulmonary bypass (CPB) exacerbates inflammation and may introduce microemboli, potentially causing direct brain injury [24]. Neurotransmitter imbalances, such as acetylcholine deficiency and dopamine excess, further disrupt cognitive function, while cerebral hypoperfusion during CPB can lead to ischemic injury, compounding the risk [25].

Prevention

Preventive strategies aim to mitigate risk factors through preoperative, intraoperative, and postoperative interventions.

Preoperative Interventions

Risk Stratification: Use of delirium prediction scores, such as those derived by Rudolph et al. (2009), to identify high-risk patients [26].

Optimization: Addressing cognitive impairment, ensuring adequate hydration, and reviewing medications to minimize psychoactive drugs [27].

Multidisciplinary Approach: Proactive geriatrics consultation, as shown to reduce delirium risk in other surgical contexts, may be beneficial [28].

Intraoperative Interventions

Anesthesia Monitoring: Depth of anesthesia monitoring using BIS to avoid excessive sedation or light anesthesia, reducing delirium risk [29].

Perfusion Management: Optimizing CPB parameters, such as maintaining mean arterial pressure and hematocrit above 22–23%, to minimize cerebral hypoperfusion [30].

Neuroprotective Strategies: Monitoring cerebral oximetry to ensure adequate brain oxygenation during surgery [31].

Postoperative Interventions

Non-Pharmacological Approaches: Implementing multicomponent interventions, including reorientation, early mobilization, sleep hygiene (e.g., using earplugs to reduce noise), and providing sensory aids like glasses or hearing aids [32][33].

Pharmacological Approaches: Dexmedetomidine, a sedative with potential delirium-reducing properties, has shown efficacy in reducing incidence compared to other sedatives like propofol. Melatonin supplementation may also help regulate sleep-wake cycles, potentially lowering delirium risk.

Management

Management of POD focuses on early recognition, treating underlying causes, and providing supportive care.

Diagnosis: Use validated tools like CAM-ICU for early detection, ensuring regular screening in the postoperative period, particularly within the first 5 days.

Treatment of Underlying Causes: Address potential triggers such as infections, electrolyte imbalances, or hypoxia, which can exacerbate delirium.

Non-Pharmacological Management: First-line interventions include creating a calm environment, ensuring adequate lighting, reorientation to time and place, and engaging patients in therapeutic activities to maintain cognitive function.

Pharmacological Management: Antipsychotics, such as risperidone, may be used cautiously for severe agitation, starting at low doses and monitoring for side effects, given the lack of strong evidence for routine use and potential risks. Benzodiazepines are generally avoided due to their delirium-inducing potential, especially in elderly patients.

Outcomes and Prognosis

POD after CABG is associated with significant short-term and long-term consequences. It increases hospital length of stay by 2–3 days and is linked to a 30-day mortality rate of 7–10%. Patients with POD experience prolonged ICU stays, higher rates of postoperative complications such as pneumonia and surgical site infections, and increased in-hospital mortality. Long-term outcomes include an increased hazard ratio for death up to 10 years postoperatively, with an adjusted HR of 1.65 (95% CI 1.38–1.97), particularly in patients without prior stroke. Additionally, POD is associated with cognitive decline and functional impairment, with some patients experiencing lasting problems with memory and thinking, affecting quality of life.

Conclusion

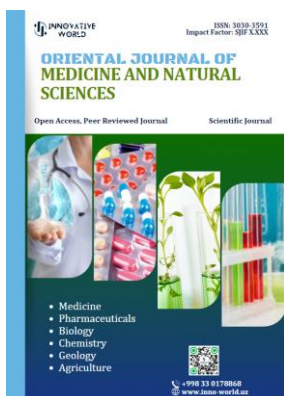
Postoperative delirium (POD) following coronary artery bypass graft (CABG) surgery is a complex and multifactorial condition with significant clinical implications. Understanding its incidence, risk factors, and pathophysiology is crucial for developing effective prevention and management strategies. While non-pharmacological interventions remain the cornerstone of POD prevention and treatment, targeted pharmacological approaches may be beneficial in selected cases. Given its association with increased morbidity, mortality, and long-term cognitive decline, early identification and comprehensive management are essential to improving patient outcomes after CABG surgery.

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DETAILED DIAGNOSIS OF HEMATOGENOUS OSTEOMYELITIS IN CHILDREN

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Abstract. Hematogenous osteomyelitis in children is a serious bone infection that spreads through the bloodstream, requiring prompt diagnosis and treatment to prevent complications such as growth disturbances and deformities. This study explores clinical presentations, laboratory markers, and imaging techniques for accurate diagnosis. Magnetic resonance imaging (MRI) remains the gold standard, while microbiological investigations enhance pathogen identification. A comprehensive, multidisciplinary approach integrating clinical, laboratory, and imaging findings is crucial for effective management and improved outcomes.

Keywords: Hematogenous osteomyelitis, pediatric infection, bone infection, diagnosis, MRI, microbiology

Relevance of the topic

Hematogenous osteomyelitis in children, an infection typically spread through the bloodstream, requires a meticulous diagnostic approach to ensure timely and effective treatment. This note provides a comprehensive overview, expanding on the key points and incorporating all relevant details from recent research and clinical guidelines, aimed at healthcare professionals and informed lay readers.

Introduction and Clinical Context

Hematogenous osteomyelitis, often acute in children, is primarily an infection of the bone originating from blood-borne pathogens. It predominantly affects the long bones, with the femur and tibia being the most common sites, accounting for 27% and 26% of cases, respectively, as noted in studies like Acute haematogenous osteomyelitis in children. The condition is critical to diagnose early, as delays can lead to growth disturbances, deformities, or even death, emphasizing the need for a high index of suspicion, especially given the insidious presentation in some children.

Clinical Presentation and Initial Assessment

The diagnostic journey begins with clinical suspicion, driven by symptoms such as fever (present in up to 75% at admission), pain, swelling, erythema, and warmth in the affected area. Children may exhibit difficulty bearing weight or a pronounced limp, particularly with lower limb

involvement, and pelvic cases might show a waddling gait. The presentation can vary, with symptoms often lasting 6–8 days before diagnosis, and up to 35% may have contiguous septic arthritis, complicating the picture. This variability underscores the importance of a thorough history and physical examination, as highlighted in Acute Hematogenous Osteomyelitis in Children: Clinical Presentation and Management.

Laboratory Evaluation: Inflammatory Markers and Microbiology

Laboratory tests are pivotal for confirming suspicion. Initial evaluation typically includes a complete blood count (CBC), C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR). Research suggests CRP is elevated in up to 98% of cases, making it highly sensitive but nonspecific, and it's preferred for monitoring due to its shorter half-life (19 hours, normalizing in 7–10 days) compared to ESR (2–3 weeks), as detailed in Acute Hematogenous Osteomyelitis in Children. The white blood cell count, however, has a sensitivity of only ~35%, and its role is more about ruling out other conditions like leukemia or malignancy.

Microbiological diagnosis is crucial, with blood cultures yielding a pathogen in 20–46% of cases, while bone exudates, abscesses, or aspirates can identify pathogens in 65–82%, often being the only diagnostic means in nearly half the cases. For children under 5 years, enhancing recovery of fastidious organisms like *Kingella kingae* by inoculating samples into blood culture bottles is recommended, with a total detection rate of ~33%. Anaerobic, fungal, and mycobacterial cultures have low yields (1–3%) but are considered in immunocompromised patients or those with atypical symptoms. Molecular methods, such as multiplex PCR-based panels, can increase *K. kingae* identification by 2–4 fold, with 89% diagnosed by molecular means in some series, though these are expensive and not always available.

Imaging Techniques: From Initial to Definitive

Imaging is a cornerstone of diagnosis, starting with plain radiographs, which are recommended to exclude alternative causes like fractures or bone tumors, though they may not show changes until 2–3 weeks into the infection. Ultrasound is sensitive for detecting joint effusions and can guide aspirations, while technetium-99m bone scintigraphy is useful for ill-defined sites or multifocal disease, though it may have false negatives in infants. The gold standard, however, is magnetic resonance imaging (MRI), with sensitivity of 97–100% and specificity of 92%, capable of detecting changes within 2–5 days and identifying complications like pyomyositis or abscesses in up to 68% of *Staphylococcus aureus* cases. Limitations include cost, availability, long scan times, and the need for sedation, as noted in Hematogenous Osteomyelitis in Infants and Children: Imaging of a Changing Disease.

Computed tomography (CT) is generally not recommended due to lower sensitivity compared to MRI and higher radiation exposure, making it less suitable for pediatric patients. The choice of imaging must balance diagnostic

accuracy with practical considerations, such as access to MRI facilities and the child's ability to cooperate during the scan.

Flowchart: Diagnosis of Hematogenous Osteomyelitis in Children

1. Clinical Suspicion:

- Fever
- Localized bone pain, tenderness
- Swelling, redness, warmth
- Limited range of motion

2. Initial Evaluation:

- **Laboratory Tests:**
 - Complete Blood Count (CBC) (↑ WBC)
 - C-Reactive Protein (CRP) and Erythrocyte Sedimentation Rate (ESR) (elevated)
 - Blood Culture

3. Imaging:

- **X-ray:** Initial imaging (may be normal in early stages)
- **MRI:** Preferred for early detection and soft tissue involvement
- **Ultrasound:** Useful for detecting subperiosteal abscess
- **Bone Scan:** Consider if MRI is unavailable

4. Definitive Diagnosis:

- **Bone Aspiration/Biopsy:**
 - Gram stain & culture
 - Histopathology

5. Diagnosis Confirmed?

- **Yes:**
 - Initiate treatment: IV antibiotics
 - Surgical drainage if needed
- **No:**
 - Consider alternative diagnoses (e.g., malignancy, trauma, arthritis)

Diagnostic Challenges and Considerations

Diagnosing hematogenous osteomyelitis can be challenging due to the variability in presentation and the potential for false negatives in early stages, particularly with imaging like plain radiographs. The role of procalcitonin remains unclear, with some studies suggesting it may aid diagnosis but lacking consensus, as seen in Acute Hematogenous Osteomyelitis in Children. Additionally, the increasing prevalence of community-associated methicillin-resistant *Staphylococcus aureus* (MRSA) complicates microbiological diagnosis, necessitating culture and sensitivity testing to guide antibiotic therapy.

In infants, the disease may present differently, with a higher risk of multifocal involvement (5–10%), and imaging strategies may need adjustment, such as considering bone scans where MRI is not feasible. The multidisciplinary approach, involving pediatric infectious disease specialists,

orthopedists, and radiologists, is essential to integrate clinical, laboratory, and imaging findings for a definitive diagnosis.

Table: Diagnostic modalities for hematogenous osteomyelitis in children

Modality	Purpose	Advantages	Limitations
Clinical Assessment	Identify symptoms (fever, pain, swelling)	Non-invasive, initial step	Subjective, may be insidious
CBC, CRP, ESR	Confirm inflammation, monitor response	CRP highly sensitive, ESR supportive	WBC low sensitivity, nonspecific
Blood Cultures	Identify pathogen	Non-invasive, guides therapy	Yield 20–46%, may be negative
Bone/Joint Cultures	Definitive microbiological diagnosis	High yield (65–82%), crucial for resistant strains	Invasive, requires procedure
PCR (Molecular)	Detect fastidious organisms (e.g., <i>K. kingae</i>)	Increases detection, rapid	Expensive, limited availability
Plain Radiography	Rule out fractures, tumors	Widely available, initial screening	Poor early detection, changes after 2–3 weeks
Ultrasound	Detect joint effusions, guide aspirations	Non-invasive, no radiation	Limited for bone changes
Bone Scintigraphy	Detect multifocal disease, ill-defined sites	Sensitive, useful in infants	False negatives possible, radiation exposure
MRI	Gold standard, detect early changes, complications	High sensitivity (97–100%), specificity (92%)	Cost, availability, sedation needed

This table encapsulates the diagnostic toolkit, highlighting the complementary roles of each modality in achieving a timely and accurate diagnosis.

Conclusion

The diagnosis of hematogenous osteomyelitis in children is a multifaceted process, integrating clinical suspicion with laboratory confirmation and advanced imaging. MRI stands out as the preferred imaging modality for its early detection capabilities, while laboratory tests like CRP and cultures are vital for confirming infection and guiding therapy. The approach must be tailored to the child's age, presentation, and access to resources, ensuring a balance between diagnostic accuracy and practical feasibility.

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MOST COMMON COMPLICATIONS ASSOCIATED WITH VASCULAR GRAFTS SURGERY IN THE COMMON CAROTID ARTERY

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Abstract. Vascular graft surgery in the common carotid artery is a crucial intervention for conditions such as atherosclerosis, trauma, and vasculitis. Despite its benefits in restoring cerebral perfusion, the procedure is associated with various complications that can impact patient outcomes. This review systematically analyzes early and late complications based on existing literature. Early complications include graft occlusion, infection, bleeding, nerve injury, and stroke, whereas late complications involve restenosis and graft degeneration. Factors influencing complication rates include surgical techniques, graft materials, and patient-specific risks. Effective management strategies, including anticoagulation, infection prevention, and long-term surveillance, are essential for improving surgical success. Further research is necessary to optimize graft selection and minimize complications.

Keywords: vascular graft surgery, common carotid artery, graft complications, stroke prevention, restenosis

Introduction

Vascular graft surgery in the common carotid artery is a critical intervention performed to address various pathological conditions, including atherosclerosis, trauma, and vasculitis, that compromise the function of this vital vessel. The common carotid artery, a major blood vessel supplying oxygenated blood to the brain, face, and neck, is essential for maintaining cerebral perfusion. Any disruption in its function can lead to severe neurological deficits or mortality, making the understanding of associated complications crucial for optimizing patient outcomes and surgical planning.

This review aims to synthesize current literature to identify and discuss the most common complications associated with vascular graft surgery in the common carotid artery, encompassing both replacement and bypass procedures. The focus is on providing a detailed analysis for healthcare professionals and researchers, with an emphasis on clinical implications and management strategies.

Methods

A systematic literature search was conducted using databases such as PubMed, ScienceDirect, and Google Scholar, with search terms including

"complications of vascular graft in common carotid artery," "common carotid artery bypass graft complications," and "carotid artery graft replacement complications." The search was limited to studies published in English, with a preference for peer-reviewed articles, retrospective and prospective studies, case reports, and review articles that specifically addressed complications in vascular graft surgery involving the common carotid artery. The review included studies up to the current date, March 13, 2025, to ensure relevance.

Results

The literature review identified several common complications associated with vascular graft surgery in the common carotid artery, categorized into early and late complications, with varying reported frequencies based on surgical technique, graft material, and patient-specific factors.

Table: Summary of common complications and reported rates

Complication	Description	Reported Rates (Examples)
Graft Occlusion/Thrombosis	Blockage of the graft, often early postoperative	Up to 14% (Roddy et al., 2002)
Infection	Graft infection, potentially leading to failure	Low, variable by patient risk
Bleeding/Hematoma	Postoperative bleeding or hematoma formation	Not quantified, significant risk
Nerve Injury	Damage to cranial nerves, causing symptoms	Temporary, reported in cases
Stroke/Neurological	Embolic or hypoperfusion events leading to stroke	6% death and stroke rate (Illuminati et al., 2005)
Restenosis/Intimal Hyperplasia	Late narrowing due to tissue growth	Common long-term, rates vary
Graft Degeneration/Aneurysm	Long-term graft failure or aneurysm formation	Less common, requires surveillance

Early Complications

- **Graft Occlusion or Thrombosis**

- Graft occlusion or thrombosis is one of the most frequent early complications, often occurring due to technical errors during anastomosis, inadequate anticoagulation, or poor inflow/outflow conditions. Studies suggest that this can lead to immediate graft failure, necessitating reintervention.
- For instance, a study by Illuminati et al. (2005) on carotid graft replacement reported varying rates of occlusion, with some cases linked to the choice of graft material, such as expanded

polytetrafluoroethylene (ePTFE) Carotid graft replacement: A durable option.

- **Infection**

- Infection of the vascular graft, though relatively rare, poses a significant risk, particularly in immunocompromised patients or those with diabetes. Infections can lead to graft failure, sepsis, or the need for explantation and reconstruction with autologous tissue.
- The incidence is generally low, but studies like Chen et al. (2018) noted isolated cases in carotid-carotid bypass procedures, emphasizing the need for prophylactic antibiotics Carotid–Carotid Artery Crossover Bypass with a Synthetic Vascular Graft for Symptomatic Type 1A Common Carotid Artery Occlusion.

- **Bleeding or Hematoma**

- Postoperative bleeding or hematoma formation can result from anastomotic leaks, inadequate hemostasis, or surgical site complications. This can lead to compression of adjacent structures, such as the airway or nerves, potentially causing respiratory distress or neurological deficits.
- Literature, including Roddy et al. (2002), highlighted bleeding as a manageable but significant risk, particularly in the immediate postoperative period Choice of material for internal carotid artery bypass grafting: Vein or prosthetic? Analysis of 44 procedures.

- **Nerve Injury**

- The common carotid artery is anatomically close to several cranial nerves, including the vagus, hypoglossal, and recurrent laryngeal nerves. Surgical manipulation can result in nerve injury, leading to symptoms such as hoarseness, dysphagia, or tongue weakness.
- Studies like Sakamoto et al. (2022) reported nerve-related complications in bypass procedures, often temporary but requiring postoperative management A case of symptomatic carotid artery occlusion after aortic arch replacement treated with carotid-carotid crossover bypass.

- **Stroke or Neurological Complications**

- Stroke or other neurological complications are significant risks, often resulting from embolic events during surgery or hypoperfusion due to clamping of the artery. The risk is influenced by surgical technique, the use of shunts, and patient-specific factors such as preexisting carotid stenosis.
- Data from early outcomes in bypass grafting, as seen in Illuminati et al. (2005), showed a 6% death and stroke rate, underscoring

the severity of this complication Carotid graft replacement: A durable option.

Late Complications

- **Restenosis Due to Intimal Hyperplasia**

- Long-term follow-up studies, such as those by Roddy et al. (2002), indicate that restenosis due to intimal hyperplasia is a common late complication, particularly with synthetic grafts like ePTFE, leading to progressive narrowing and potential graft failure
- Choice of material for internal carotid artery bypass grafting: Vein or prosthetic? Analysis of 44 procedures.

- **Graft Degeneration or Aneurysm Formation**

- Aneurysmal degeneration of the graft, though less common, can occur, especially with synthetic materials, potentially leading to rupture or embolization. This is a long-term risk that requires regular imaging surveillance.

Discussion

The identified complications have significant implications for patient care and surgical planning. Graft occlusion or thrombosis, with reported rates as high as 14% in some studies (e.g., severe recurrent stenosis in 7 out of 50 patients in Roddy et al., 2002), necessitates robust anticoagulation strategies and regular postoperative imaging, such as duplex ultrasonography, to detect early signs of failure. Infection, though less frequent, requires meticulous surgical technique and prophylactic antibiotics, with infected grafts often requiring explantation and reconstruction using autologous veins, which have shown better resistance to infection in some cases.

Bleeding and hematoma formation are manageable with intraoperative and postoperative monitoring, but prompt intervention is crucial to prevent compression-related complications. Nerve injury, while often temporary, can impact quality of life, necessitating careful dissection and possibly postoperative speech or swallowing therapy. Stroke risk, a major concern given the artery's role in cerebral perfusion, can be mitigated with intraoperative neuromonitoring and shunt use, but patient-specific factors like age and preexisting conditions play a significant role.

Long-term complications like restenosis and graft degeneration highlight the need for extended follow-up, with studies suggesting regular surveillance to detect these issues early. The choice of graft material, such as ePTFE versus autologous vein, remains controversial, with some evidence suggesting lower restenosis rates with prosthetic grafts in certain locations, but higher infection risks (Illuminati et al., 2005).

Conclusion

Vascular graft surgery in the common carotid artery is a complex procedure with a spectrum of potential complications, ranging from early issues like graft occlusion and stroke to late problems like restenosis.

Understanding these complications and their management is essential for improving patient outcomes. Further research is needed to refine surgical techniques, optimize graft materials, and establish standardized complication rates, particularly given the limited specific data for the common carotid artery.

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NEW TREATMENT APPROACHES FOR GLAUCOMA: RECENT ADVANCEMENTS AND INNOVATIONS IN OPHTHALMOLOGY

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Abstract

Glaucoma remains a leading cause of irreversible blindness worldwide, necessitating continuous advancements in treatment strategies. This review explores the latest developments in glaucoma management, focusing on pharmacological innovations, minimally invasive glaucoma surgeries (MIGS), nanotechnology, artificial intelligence (AI), and wearable technologies. Novel drug classes, sustained-release delivery systems, and combination therapies are enhancing intraocular pressure (IOP) control while improving patient adherence. MIGS and biodegradable implants provide safer surgical alternatives with reduced complications. Nanotechnology-based drug delivery and theranostic platforms are revolutionizing treatment precision, while AI enhances diagnosis, monitoring, and patient engagement. Additionally, emerging neuroprotective strategies, including gene therapy and stem cell applications, hold promise for preserving retinal ganglion cells. These advancements collectively contribute to a more effective, personalized, and patient-centered approach to glaucoma management.

Keywords: Glaucoma, intraocular pressure, nanotechnology, minimally invasive glaucoma surgery, artificial intelligence

Introduction

Glaucoma, a leading cause of irreversible blindness worldwide, is characterized by progressive optic neuropathy and elevated intraocular pressure (IOP). Recent advancements in ophthalmology have introduced innovative treatment approaches that aim to improve patient outcomes, reduce treatment burden, and address the limitations of traditional therapies. This response explores the latest developments in glaucoma treatment, including pharmacological innovations, minimally invasive surgical techniques, nanotechnology, and emerging therapeutic modalities.

Pharmacological Advancements in Glaucoma Management

Pharmacological treatments remain the first line of defense in glaucoma management, focusing on reducing IOP by suppressing aqueous humor production or enhancing outflow. Recent advancements in drug development have introduced novel agents and improved delivery systems to overcome the

limitations of traditional eye drops, such as poor bioavailability and nonadherence.

New Drug Classes and Targets

Researchers have identified new molecular targets for glaucoma treatment, including rho kinase inhibitors, nitric oxide donors, and endothelin receptor antagonists. These agents not only reduce IOP but also have neuroprotective effects, addressing the neurodegeneration associated with glaucoma (Giuffrida et al., 2024) (Ibraheem & Alhasan, 2024).

Sustained-Release Drug Delivery Systems

To improve patient compliance and drug bioavailability, sustained-release formulations have been developed. These include intraocular implants, injectable depot systems, and contact lenses that release medications over extended periods. For instance, liposomal drug delivery systems have shown promise in enhancing the efficacy and reducing the frequency of administration (Petrov et al., 2024) (Bose et al., 2024).

Combination Therapies

Combination therapies that target multiple pathways, such as reducing aqueous humor production and increasing outflow, are being explored. These therapies aim to achieve better IOP control with fewer side effects (Ibraheem & Alhasan, 2024) (Wang et al., 2024).

Minimally Invasive Glaucoma Surgeries (MIGS)

MIGS have revolutionized glaucoma treatment by offering safer and less invasive alternatives to traditional surgeries. These procedures are designed to reduce IOP by enhancing aqueous humor outflow while minimizing tissue trauma.

Implantable Devices

Devices such as the Xen gel stent and PRESERFLO MicroShunt have gained popularity due to their ability to lower IOP with minimal surgical intervention. These implants are designed to bypass the trabecular meshwork and facilitate aqueous outflow into the subconjunctival space (Chan et al., 2023) (Caroline et al., 2024).

Laser-Based Interventions

Selective laser trabeculoplasty (SLT) and direct selective laser trabeculoplasty (DSLT) are emerging as effective laser-based treatments. These procedures reduce IOP by enhancing trabecular outflow and are associated with fewer side effects compared to traditional laser therapies (Anthony et al., 2025) (Micheletti et al., 2024).

Biodegradable Implants

A novel polymeric minimally invasive glaucoma implant made from polycarbonate bisamide (PC-BA) has been developed. This biodegradable implant enhances aqueous humor outflow and gradually degrades over time, leaving behind a natural outflow pathway (Pereira et al., 2024).

Nanotechnology in Glaucoma Treatment

Nanotechnology has emerged as a transformative approach in glaucoma management, addressing challenges such as poor drug bioavailability and nonadherence to topical medications.

Nanostructured Drug Delivery Systems

Nanocarriers, including liposomes, nanoparticles, and niosomes, have been engineered to improve the delivery of antiglaucoma medications. These systems enhance corneal permeability, prolong drug retention, and reduce systemic side effects (Arsha & Aniyana, 2025) (Zembala et al., 2023).

Drug-Eluting Contact Lenses

Contact lenses loaded with nanomaterials are being explored as a platform for sustained drug delivery. These lenses can release medications over extended periods, improving adherence and reducing the need for frequent eye drop administration (Baghban et al., 2023).

Theranostic Platforms

Nanotechnology-based theranostic platforms combine diagnostic and therapeutic capabilities, enabling real-time monitoring of IOP and personalized drug delivery. These platforms hold promise for improving disease management and patient outcomes (Shean et al., 2024) (Baghban et al., 2023).

Artificial Intelligence in Glaucoma Care

Artificial intelligence (AI) is transforming glaucoma diagnosis, monitoring, and treatment by enhancing precision and personalization.

AI in Diagnosis and Monitoring

AI algorithms analyze retinal imaging and visual field tests to detect early signs of glaucoma. Machine learning models can also predict disease progression and identify high-risk patients (Salowe et al., 2024).

AI-Guided Surgery

Robotic surgery and AI-based guidance systems are being developed to improve the precision of glaucoma surgeries, such as MIGS and trabeculectomy (Salowe et al., 2024).

Patient Engagement and Adherence

AI-powered platforms, including chatbots and reminder systems, are being used to educate patients and improve adherence to treatment regimens (Salowe et al., 2024).

Wearable Technologies for Glaucoma Management

Wearable devices are playing an increasingly important role in the continuous monitoring and treatment of glaucoma.

Table: Comparison of emerging glaucoma treatment modalities

Modality	Mechanism of Action	Key Advantages	Citation
Bimatoprost Implant	Sustained-release formulation reducing IOP for up to 1 year	Minimizes drop burden and improves patient compliance	(Anthony et al., 2025)

Xen Gel Stent	Subconjunctival MIGS device facilitating aqueous outflow	Minimally invasive with rapid recovery	(Chan et al., 2023)
Liposomal Drug Delivery	Targeted and sustained drug delivery via nanocarriers	Enhances bioavailability and reduces toxicity	(Bose et al., 2024)
AI-Powered Diagnostics	Machine learning models for early detection and progression monitoring	Enables early intervention and personalized treatment plans	(Salowe et al., 2024)
Stem Cell Therapy	Regeneration of trabecular meshwork and RGCs	Potential for tissue repair and vision restoration	(Ciociola et al., 2023)

Continuous IOP Monitoring

Devices such as the Sensimed Triggerfish, a smart contact lens, enable continuous IOP monitoring. These wearables provide valuable insights into IOP fluctuations and disease progression (Shean et al., 2024).

Drug Delivery via Wearables

Wearable devices, such as goggles with integrated drug delivery systems, are being explored for noninvasive IOP reduction. These systems use negative pressure to lower IOP and are designed for patient convenience (Anthony et al., 2025) (Shean et al., 2024).

Neuroprotection and Emerging Therapeutic Modalities

While IOP reduction remains the cornerstone of glaucoma management, there is growing interest in neuroprotective therapies that target retinal ganglion cell (RGC) survival.

Pharmacological Neuroprotection

Agents such as brimonidine, memantine, and nicotinamide have shown neuroprotective effects in preclinical studies. These drugs aim to prevent RGC degeneration independent of IOP reduction (Wang et al., 2024).

Stem Cell Therapy

Stem cells are being investigated for their potential to repair damaged trabecular meshwork and RGCs. These cells can differentiate into functional cells, restoring aqueous outflow and preserving vision (Ciociola et al., 2023).

Gene Therapy

Gene therapy is being explored to modify aqueous humor dynamics and protect RGCs. Viral vectors and siRNA are being used to deliver therapeutic genes to the eye (Ciociola et al., 2023).

Future Directions in Glaucoma Treatment

The future of glaucoma treatment is likely to be multifaceted, integrating advances in pharmacology, surgery, nanotechnology, and AI. Key areas of focus include:

Personalized Medicine

Advances in genomics and AI will enable personalized treatment plans tailored to individual patient needs and disease profiles (Salowe et al., 2024) (Ciociola et al., 2023).

Multimodal Therapies

Combining different treatment modalities, such as neuroprotection and IOP-lowering therapies, may provide additive or synergistic effects (Micheletti et al., 2024) (Wang et al., 2024).

Regenerative Therapies

Stem cell therapy and gene editing technologies hold promise for repairing damaged tissues and restoring vision in advanced glaucoma (Ciociola et al., 2023).

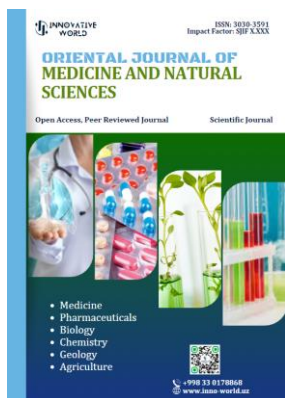
Conclusion

Recent advancements in glaucoma treatment have significantly expanded the range of options available to clinicians and patients. From novel pharmacological agents and minimally invasive surgeries to nanotechnology and AI-driven innovations, these developments are transforming the landscape of glaucoma care. As research continues to uncover new targets and technologies, the future of glaucoma management is poised to be more effective, patient-centric, and life-changing.

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Kimyo darsida qiziqarli tajribalar o'tkazishning ahamiyati va usullari

G'aniyeva Shaxloxon Nabidjanovna

Namangan shahar 5 - umumiy o'rta ta'lim maktabi
kimyo fani o'qituvchisi

Annotasiya: Kimyo tabiiy fanlarning eng muhim tarmoqlaridan biri bo'lib, uning o'qitilishi eksperimental tadqiqotlar bilan chambarchas bog'liq. Tajribalar o'quvchilarga nazariy bilimlarni chuqurroq tushunish va amaliy qo'llash imkoniyatini beradi. Shu sababli, kimyo darslarida qiziqarli va interaktiv tajribalar o'tkazish muhim hisoblanadi. Ushbu maqolada kimyo darsida eksperimentlarning o'rni, ularning o'quv jarayoniga ta'siri va ba'zi qiziqarli tajriba namunalari keltiriladi.

Kalit so'zlar: Nazariy bilimlar, tajriba, eksperiment, "Olovli ko'rinmas yozuv", dars ishlanma, kimyoviy reaksiyalar.

Kimyoviy tajribalarning o'quv jarayonidagi ahamiyati

Kimyo darsida tajribalar o'tkazish quyidagi jihatlari bilan o'quv jarayonini samarali qiladi:

- **Ko'rish va amaliy tushunish** – Nazariy bilimlar vizual va tajribaviy yo'l bilan tushuntirilsa, o'quvchilar materialni tezroq o'zlashtiradi.

- **Qiziqish va motivatsiyani oshirish** – O'quvchilarning tajribalarda bevosita ishtirok etishi ularni fanga bo'lgan qiziqishini oshiradi.

- **Mantiqiy fikrlashni rivojlantirish** – Eksperimentlar natijasini taxmin qilish va tahlil qilish orqali o'quvchilar analitik fikrlashni o'rganadilar.

- **Amaliy bilimlarni mustahkamlash** – Darslikdagi nazariy ma'lumotlarni amaliyot bilan bog'lash o'quvchilarning bilimlarini mustahkamlaydi.

Kimyo darsida o'tkazilishi mumkin bo'lgan qiziqarli tajribalar

1. "Olovli ko'rinmas yozuv" tajribasi.

Kerakli materiallar:

- Limon sharbati yoki sirka
- Qog'oz
- Cho'p yoki qalam
- Sham yoki elektr isitgich

O'tkazish tartibi:

1. Limon sharbati yoki sirka bilan qog'ozga yozuv yoki rasm chiziladi.
2. Qurigandan so'ng, yozuv deyarli ko'rinmaydi.
3. Qog'oz ehtiyotkorlik bilan sham yoki elektr isitgich ustida isitiladi.

4. Natijada, limon kislota parchalanib, qog'ozda jigarrang yozuv paydo bo'ladi.

Izoh:

Bu tajriba organik moddalar termik parchalanish natijasida rang o'zgarishini namoyish etadi.

2. "Rang o'zgaruvchi kislota-ashyoviy indikatorlar".

Kerakli materiallar:

- Qizil karam (yoki choy)
- Sirka
- Soda
- Shisha stakanlar

O'tkazish tartibi:

1. Qizil karam maydalab, issiq suvda damlanadi va suvi ajratib olinadi.
2. Hosil bo'lgan eritmaga turli suyuqliklar qo'shiladi: sirka (kislota), soda eritmasi (ishqor).
3. Eritma kislota ta'sirida qizil yoki pushti, ishqor ta'sirida esa yashil yoki ko'k rangga o'zgaradi.

Izoh:

Bu tajriba kimyoviy indikatorlarning muhitga bog'liq rang o'zgarishini ko'rsatadi.

3. "Yong'in chiqarmasdan portlovchi ko'pik".

Kerakli materiallar:

- Vodorod peroksid (H_2O_2)
- Iodid tuzi (NaI yoki KIO_3)
- Idish va qoshiq
- Suv va suyuq sovun

O'tkazish tartibi:

1. Idishga vodorod peroksid va suyuq sovun aralashtiriladi.
2. Ustiga iodid tuzi qo'shilganda, tezkor reaksiyaga kirishib, ko'pik hosil bo'ladi.

Izoh:

Bu tajribada katalizator yordamida kislorod tez ajralib chiqadi va ko'pik shakllanadi. Tajriba "fil tishi pastasi" nomi bilan ham mashhur.

Bunday kimyoviy tajribalarni amaliy dars jarayonlarida qo'llashimiz mumkin yoki ochiq dars mashg'ulotlarida hamda mustahkamlash darslarida dars ishlanma tayyorlab shu asosda o'tishimiz ham mumkin. Quyida sizlarga shunday dars ishlanmaga namuna tayyorlandi.

DARS ISHLANMA

Fan: Kimyo

Sinf: 8-9-sinf

Dars mavzusi: Gaz ajralib chiqish bilan kechadigan kimyoviy reaksiyalar

Dars maqsadi:

- **Ta'limiy:** O'quvchilarga gaz ajralib chiqish bilan kechadigan kimyoviy reaksiyalar haqida tushuncha berish.

- **Tarbiyaviy:** Kimyo faniga bo'lgan qiziqishni oshirish, eksperimentlarni xavfsizlik qoidalariga rioya qilgan holda bajarishga o'rgatish.

- **Rivojlantiruvchi:** O'quvchilarning kuzatish, tahlil qilish va xulosa chiqarish ko'nikmalarini rivojlantirish.

Darsning borishi:

1. Tashkiliy qism (5 daqiqa)

- Salomlashish, davomatni tekshirish.
- O'quvchilarning darsga tayyorgarligini tekshirish.
- Dars maqsadini tushuntirish.

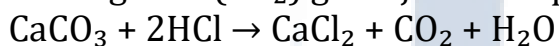
2. O'tgan mavzuni takrorlash (10 daqiqa)

- Kimyoviy reaksiyalarning turlari qanday?
- Gaz ajralib chiqish bilan kechadigan reaksiyalarga misollar.

3. Yangi mavzu bayoni (15 daqiqa)

- Kimyoviy reaksiyalar natijasida gaz ajralib chiqishi mumkin. Bunga kislotalarning karbonat yoki gidrokarbonatlar bilan reaksiyasi misol bo'ladi.

- Masalan, kalsiy karbonat va xlorid kislotaning o'zaro ta'siri natijasida karbonat angidrid (CO_2) gazi ajralib chiqadi:



- Bu reaksiyadan kundalik hayotda sodali suv tayyorlash yoki marmar va ohaktoshlarning kislotaga ta'sirini tushuntirishda foydalaniladi.

4. Tajriba: "Sirkali shishiruvchi shar" (15 daqiqa)

Tajribaning maqsadi: Gaz ajralib chiqish bilan kechadigan kimyoviy reaksiyani kuzatish.

Kerakli materiallar:

- Sirka (ushbu tajribada 9% lik osh sirkasi ishlatiladi)
- Ichimlik sodasi (NaHCO_3)
- Shar
- Kichik idish yoki shisha idish (masalan, shisha butilka)

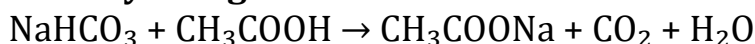
Tajriba bajarilish bosqichlari:

1. Idishga taxminan 100 ml sirka quyiladi.
2. Sharga 1-2 choy qoshiq ichimlik sodasi solinadi.
3. Shar og'zi shisha idishning bo'yniga o'rnatiladi, lekin ichidagi soda idishga tushmaydi.
4. Sharni biroz ko'tarib, ichidagi soda idishga tushiriladi.
5. Soda sirkaga ta'sir qilib, karbonat angidrid (CO_2) ajralib chiqadi va shar shishadi.

Tajriba natijasi:

- Sirka va soda reaksiyasidan karbonat angidrid (CO_2) gazi ajralib chiqadi.
- Bu gaz sharning ichiga to'planib, uni shishiradi.

Reaksiya tenglamasi:



5. Xulosa va mustahkamlash (10 daqiqa)

- Gaz ajralib chiqish bilan kechadigan reaksiyalarga yana qanday misollar keltirish mumkin?

- Kundalik hayotda bunday reaksiyalar qayerda uchraydi?
- Agar sirkani ko'proq qo'shsak, qanday natija kuzatiladi?

6. Uyga vazifa

- Gaz ajralib chiqish bilan kechadigan yana uchta kimyoviy reaksiyaga misol yozish.
- Uy sharoitida sodali shishiruvchi shar tajribasini o'tkazib, kuzatishlarni daftarga yozish.

Dars yakuni:

- O'quvchilar faolligi baholanadi.
- Savol-javob asosida asosiy tushunchalar takrorlanadi.

Xulosa:

Bu tajriba orqali o'quvchilar kimyoviy reaksiyalar natijasida gaz ajralib chiqishini aniq kuzatishlari mumkin. Shu bilan birga, kimyoning hayotiy ahamiyatini tushunib yetadilar.

Xulosa qilib aytganda kimyo darslarida qiziqarli tajribalar o'tkazish o'quvchilarning fanga bo'lgan qiziqishini oshirib, bilimlarini mustahkamlashga yordam beradi. Bu usullar orqali nazariy bilimlar hayotiy voqelik bilan bog'lanib, o'quvchilar eksperimental tadqiqotlarga jalb qilinadi. Kelajakda o'qituvchilar zamonaviy laboratoriya usullari va interaktiv metodlardan foydalangan holda kimyo ta'limini yanada qiziqarli va samarali qilishlari mumkin.

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