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Article / Review

DIFFERENTIAL DIAGNOSIS AND MANAGEMENT TACTICS OF JAUNDICE IN NEWBORNS

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Abstract.

Modern approaches to the treatment of neonatal jaundice have undergone significant changes over the past decades, which often leads to disagreements among neonatologists. This study aims to explore key controversies in differential diagnosis and management, based on the principles of evidence-based medicine. Several key factors have been found to increase the likelihood of developing significant neonatal hyperbilirubinemia (NH). These include birth before 38 weeks of gestation, and the presence of older children in the family who had neonatal jaundice, which required phototherapy. Also playing a critical role is insufficient feeding of exclusive breast milk and the appearance of noticeable yellowing of the skin in the first days after birth. These circumstances significantly increase the risk of elevated bilirubin levels in the newborn's blood, which may require medical intervention. Current understanding of the sources of jaundice associated with breastfeeding has undergone significant changes in recent years. Studies demonstrate that, provided adequate breastfeeding is provided during the first five days of a newborn's life, the intensity of jaundice does not show significant differences compared to formula-fed infants. In breastfeeding-associated jaundice, it has been confirmed that unconjugated bilirubin (UNB) levels naturally return to normal levels. It is recommended that newborns with jaundice be breastfed frequently, at least 8-12 times a day, including daytime and nighttime. This diet helps avoid calorie deficiency and dehydration, which in turn helps reduce the concentration of bilirubin in the blood. Maintaining adequate hydration and nutrition plays a key role in managing infants with neonatal jaundice. Oral administration of water or glucose is not effective in preventing or reducing serum bilirubin levels in hyperbilirubinemia. If full breastfeeding is difficult, it is recommended to supplement the newborn with expressed breast milk. The use of infusion therapy is justified only when the volume of breast milk consumed is insufficient to meet the daily fluid requirement.

Key words: neonatal jaundice, hyperbilirubinemia, newborns, phototherapy.

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Zamonaviy tushunchalarga ko'ra, neonatal sariqlik (NS) (yangi tug'ilgan chaqaloqlarning sariqligi) - yangi tug'ilgan chaqaloqning qonida bilirubin darajasining oshishi natijasida terining, skleraning va / yoki ko'rinadigan shilliq pardalarning sarg'ayishi. Kasallik juda yuqori va irqiy farqlarga ega. Evropa aholisida neonatal sariqlik hayotning 1-haftasida to'liq muddatli chaqaloqlarning 60% va erta tug'ilgan chaqaloqlarning 80% da uchraydi. Chaqaloqlar sariqligi ichida ko'pincha fiziologik sariqlik qayd etiladi va barcha sariqliklarning 60-70% ni tashkil qiladi. Ko'krak suti bilan oziqlanganda, bolalarning 10% bir oyligigacha sariqlik cho'ziladi [1,2,4,16].

Terining sariqlik darajasini vizual baholash uchun modifitsirlangan Kramer shkalasidan foydalanish tavsiya etiladi. Kramer shkalasidan foydalanishga alternativasi teri bilirubin darajasini transkutan bilirubinometriya (TKB) yordamida aniqlash bo'lishi mumkin. Ko'pgina G'arb mamlakatlarida TKB mavjudligi tufayli Kramer shkalasi ishlatilmaydi. TKBdan homiladorlikning 35 haftasidan va chaqaloq hayotning dastlabki 24 soatidan keyin paydo bo'lgan sariqliklarda foydalanish ko'rsatiladi [10,11].

Agar bolaning teri rangi Kramer shkalasi bo'yicha 3-5 zonalarda aniqlansa, qon zardobidagi umumiy bilirubin yoki TKB ni majburiy aniqlash tavsiya etiladi. Agar TKB ni aniqlashning iloji bo'lmasa, bilirubin darajasi 250 mkmol / l dan ortiq bo'lsa, homiladorlik davri 35 haftadan kam bo'lsa, tug'ruqdan keyingi yosh 24 soatdan kam bo'lsa, o'tqazilayotgan davoni samaradorligini baholash uchun qon zardobidagi umumiy bilirubin aniqlanadi. Agar sariqlik Kramer shkalasi bo'yicha 1-2 zonada va bolaning yaxshi klinik holatida kasalxonaga yotqizmaslik va laboratoriya tekshiruvini o'tkazmaslik kerak [5,7].

Paydo bo'lish vaqtiga ko'ra erta (bolaning hayotining dastlabki 36 soatida paydo bo'ladi), fiziologik, cho'zilgan va kech sariqlik farqlanadi [12,29].

Soha	Umumiy bilirubin (mkmol/l)
I	100
II	150
III	200
IV	250
V	>250

Fiziologik sariqlikning muhim belgilari shundaki, u ikkinchi kunning oxiridan boshlab paydo bo'ladi, kindik chizig'idan pastga tushmaydi (Kramer shkalasi bo'yicha 1-2 zonalar), qon zardobidagi umumiy bilirubin 205 mkmol/l va bola hayotning 14-kuniga qadar davom etadi [3,5]. Bola faol, reflekslar fiziologik, faol so'rish refleksi, tana harorati normal bo'ladi. Jigar va taloq kattalashmagan. Siydik och rangda, siydik chiqarish soni yoshga to'g'ri keladi, najas sariq rangda bo'ladi. Bunday bolalarda iloji bo'lsa, transkutan bilirubinometriya tavsiya etiladi. Emizishni etarli darajada ta'minlash, kuzatish va parvarish qilish kerak [15]. Asoratlangan fiziologik sariqlik chaqaloq hayotning ikkinchi kunning oxiridan boshlab paydo bo'ladi va Kramer shkalasi bo'yicha 3-4 zonalar to'gri keladi. Bola karaxt, reflekslarining buzilishi (shu jumladan, so'rish refleksi) shaklida namoyon bo'lishi mumkin. Jigar va taloq kattalashishi mumkin. Siydik och rangda, siydik chiqarish soni yoshga to'g'ri keladi, najas rangli bo'ladi [6,13]. Agar bolaning ahvoli buzilmagan bo'lsa, zardobidagi umumiy bilirubin aniqlanadi, fototerapiyani qabul qilish va ko'krak suti bilan emizish, kuzatish va parvarish qilishni ta'minlash kerak. Agar bolaning ahvoli buzilgan bo'lsa, darhol fototerapiyani boshlash, zardobidagi umumiy bilirubin aniqlash, etarli emizish, kuzatish va parvarish qilishni ta'minlash bilan birga yo'ldosh kasalliklarni aniqlash va davolash kerak [8,22].

Cho'zilgan (uzoq muddatli) sariqlik vaqtida tug'ilgan chaqaloqlarda hayotning 14-kunidan va erta tug'ilgan chaqaloqlarda 21-kundan ko'proq davom etadi, aniq pasayish tendentsiyasisiz. Kech sariqlik hayotning 7-kunidan keyin paydo bo'ladi. Bolaning ahvoli qoniqarli yoki buzilgan bo'lishi mumkin. Jigar va taloq kattalashishi mumkin. Siydik va najasning rangi o'zgarishi mumkin. Bunday sariqlikni davolashda zardobidagi umumiy bilirubin aniqlanadi va uning fraksiyalarini, jigar kattalashganda - ALT va AST fermentlarining faolligini aniqlash, vaznni nazorat qilish, emizishning yetarliligini baholash va neonatal sariqlikning sabablarini aniqlash uchun keyingi tekshiruvni ta'minlash kerak [11,13]. Yangi tug'ilgan chaqaloqni ahvoli yomonlashganda, zardobidagi umumiy bilirubinning 200 mkmol/l dan oshishi, bog'langan bilirubin fraktsiyasi (BB) 34 mkmol / l dan (zardobidagi umumiy bilirubin darajasining 20% dan ko'prog'i), jigar yoki taloqning kattalashishi, qora rangdagi siydik va / yoki ahlatning rangsiz bo'lishi kuzatilsa bolaning zudlik bilan kasalxonaga yotqizish kerak [15].

Yangi tug'ilgan chaqaloqning xavfli sariqligi bola hayotining dastlabki 24 soatida paydo bo'ladigan har qanday sariqlik, shuningdek, 24 dan 48 soatgacha bo'lgan va qo'l oyoqlarida tarqaladigan sariqlik hisoblanadi [1,4]. Agar xavfli sariqlik belgilari paydo bo'lsa, zardobidagi umumiy bilirubinning natijalarini kutmasdan, fototerapiya darhol boshlanishi kerak. Zardobidagi umumiy bilirubin darajasini oshiradigan xavf omillarga erta tug'ilish, qon ketish (kefalogematoma, teri ostiga qon ketish), to'yib ovqatlanmaslik, tez-tez regurgitatsiya, tana vaznining keskin yo'qolishi, umumiy infektsiyaning mavjudligi, ona va bolaning qon guruhi va Rh faktorining mos kelmasligi, irsiy gemolitik anemiya yoki gemolitik kasalliklar kiritish mumkin [9,23].

So'nggi yillarda ona suti bilan bog'liq sariqlikning etiologiyasi haqidagi qarashlar sezilarli darajada o'zgardi. XX asrning 60-80-yillarida asosiy mexanizm ona sutida mavjud bo'lgan ba'zi moddalar (pregnandiol, lipaza, ba'zi turdagi yog'li kislotalar va boshqalar) ning taxminiy ta'siri tufayli jigarda bilirubin konjugatsiyasining pasayishi deb hisoblangan. XX asrning oxirida bu nazariyalar rad etildi. Hozirgi vaqtda emizishni yetarli darajada bo'lmasligi nisbiy ochlikka olib kelishi isbotlangan, bu esa bilvosita bilirubinning (BB) reabsorbtsiyasini kuchaytiradi. Bundan tashqari, chaqaloq hayotning birinchi kunlarida och qolishi, mekoniyning o'tishining kechikishiga va bolaning qoniga katta miqdordagi bilvosita bilirubinning qaytib so'rilishini o'z ichiga oladi [2,9,10].

Tadqiqotlar shuni ko'rsatadiki, bolaning dastlabki 5 kunida yetarli ko'krak suti bilan emizdirish sun'iy oziqlantirishda bo'lgan bolalar bilan sariqlikning namoyon bo'lish darajasi farq qilmaydi.

Yangi tug'ilgan chaqaloqlarning fiziologik sariqligi, shu jumladan cho'zilgan sariqlikdan quyidagicha farqlanadi [3,4,8]:

I. Bilirubin hosil bo'lishining kuchayishi (konjugatsiyalanmagan giperbilirubinemiya).

A. Gemolitik sabablar:

1. Izoimmunizatsiya natijasida homilaning va yangi tug'ilgan chaqaloqning gemolitik kasalligi:

- Rh omili bo'yicha;
- ABO tizimi bo'yicha;
- boshqa antigenlar.

2. Dori-darmonlarni qabul qilish natijasida kelib chiqqan gemolizning kuchayishi.

3. Irsiy gemolitik anemiya.

B. Gemolitik bo'lmagan sabablar:

1. Qon quyilishi.

2. Politsitemiya.

3.Bilirubinning enterogepatik aylanishining kuchayishi (ingichka ichak atreziyasi, pilorostenoz, Girshsprung kasalligi, ko'krak suti bilan bog'liq sariqlik).

II. Bilirubin konjugatsiyasining pasayishi (asosan bog'lanmagan bilirubin ortishi bilan).

1. Krigler-Nayyar kasalligi, 1 va 2 turlari.

2. Jilber sindromi.

3. Gipotireoidizm.

4. Ko'krak suti bilan oziqlanadigan yangi tug'ilgan chaqaloqlarning sariqligi.

III. Bilirubinning ekskretsiyasining kamayishi (asosan bog'langan bilirubinning ortishi bilan).

1. Gepatotsellyulyar kasalliklar:

- toksik;
- yuqumli;
- metabolik.

2. O't quyiqlashish sindromi.

3. O't chiqishining obstruktsiyasi (biliar atreziya):

- jigardan tashqari;
- jigar ichi.

Buyuk Britaniya klinik protokoliga ko'ra neonatal sariqlikning birlamchi diagnostikasi uchun zarur laboratoriya tekshiruvlari: zardobdagi umumiy bilirubin, gematokrit, ona va bola qon guruhi, Kumbs testi. Tashxisni aniqlashtirish uchun umumiy qon tahlili va qon bakteriologik tekshiruvi, qondagi G6FD darajasini aniqlash, qon, siydik va / yoki orqa miya suyuqligi tekshiruvi o'tkaziladi [28,30].

Neonatal sariqligi bilan kasallangan yangi tug'ilgan chaqaloqlarni iloji bo'lsa, kaloriya tanqisligi va / yoki suvsizlanishini rivojlanish xavfini kamaytirish va shu bilan giperbilirubinemiyani kamaytirish uchun tungi tanaffussiz kuniga kamida 8-12 marta emizdirish kerak. Suv yoki glyukoza eritmasini peroral yuborish giperbilirubinemiya rivojlanishiga va bilirubin darajasini pasaytirmaydi. Infuzion terapiya faqat qabul qilingan ona suti miqdori suyuqlikning kerakli sutkalik hajmini ta'minlay olmasa ko'rsatiladi [5,7]. Shuni alohida ta'kidlash kerakki, bugungi kunda neonatal sariqlikni davolashning xorijiy protokollariga ko'ra tavsiya etilgan yagona usullari - bu fototerapiya va qon almashinuvi. Shunday qilib, Buyuk Britaniyaning klinik ko'rsatmalariga ko'ra, homiladorlik muddati 38 hafta va undan ko'p bo'lgan yangi tug'ilgan chaqaloqlarda fototerapiya zardobidagi umumiy bilirubinning darajasi 350 mkmol/l dan yuqori bo'lganida va qon almashinuvi - zardobidagi umumiy bilirubinning 450 mkmol/l dan yuqori bo'lganda boshlanishi kerak

[11,14]. AQSh tavsiyalariga ko'ra, homiladorlik 38 hafta yoki undan ko'p bo'lgan va xavf omillari bo'lmagan yangi tug'ilgan chaqaloqlarda fototerapiya zardobidagi umumiy bilirubinning darajasi 359 mkmol/l dan oshganda boshlanishi kerak [4,22]. Erta tug'ilgan chaqaloqlarda va gemolitik kasallik belgilari bo'lgan bolalarda terapiyani boshlash uchun zarur bo'lgan zardobidagi umumiy bilirubinning darajasi sezilarli darajada kamayadi [9].

Agar fototerapiya paytida bola infuzion terapiyani qabul qilsa yoki ona suti bilan oziqlansa, suyuqlik va / yoki sut miqdorini kunlik ehtiyojning 10% ga yoki 0,5-1,0 ml / kg / soat ga oshirish tavsiya etiladi. Fototerapiya paytida bilirubin chaqaloqning terisidan tezda yo'qoladi, shuning uchun terining rangi fototerapiya paytida va uni to'xtatgandan keyin 24 soat davomida mavjud giperbilirubinemiya darajasini ko'paytirmaydi. Fototerapiya paytida bilirubin chaqaloqning terisidan tezda yo'qoladi, shuning uchun terining rangi fototerapiya paytida va uni to'xtatgandan keyin 24 soat davomida o'zgarmaydi [2,8].

Fototerapiyaning asoratlariga diareya, kuyishlar, suvsizlanish va teri toshmasi kiradi [3]. Bilirubin fraktsiyalarini kuzatib borish kerak: bog'langan bilirubin fraktsiyasi 34 mkmol/l dan oshmasligi kerak (zardobidagi umumiy bilirubinning darajasining 20% dan uqori) [10]. Zardobidagi umumiy bilirubin darajasining tegishli darajaga etmagan bo'lsa, fototerapiya qo'llanilmasligi kerak. Intensiv fototerapiya, agar zardobidagi umumiy bilirubinning darajasining o'sish tezligi soatiga 8,5 mkmol/l dan oshsa, qon almashinuvi uchun zardobidagi umumiy bilirubinning uchun chegaradan 50 mkmol/l dan oshmasa, bitta fototerapiyadan hech qanday javob bo'lmasa (zardobidagi umumiy bilirubinning terapiya boshlanganidan 6 soat o'tgach o'sishda davom etsa yoki kamaymasa) [1,3]. Bunday holda, ovqatlanish uchun tanaffuslar qilinmaydi (in'ektsiya / enteral oziqlantirish qo'llaniladi). Zardobidagi umumiy bilirubin darajasi fototerapiyani buyurish chegarasidan 50 mkmol/l dan pastroq o'zgarganda fototerapiya to'xtatiladi. Fototerapiyani to'xtatgandan keyin 12-18 soatdan keyin zardobidagi umumiy bilirubinni tekshirish tavsiya etiladi [6,21].

Agar erta va / yoki «xavfli» sariqlik aniqlansa, darhol fototerapiyani boshlash kerak. Agar 4-6 soatdan keyin zardobdagi umumiy bilirubinni qayta aniqlashda bu ko'rsatkich 20-35 mkmol/l ga pasaygan bo'lsa va uning o'sish intensivligi pasaygan bo'lsa (qon almashinuvi talab qiladigan darajadan past), fototerapiya davom etadi. Aks holda intensiv fototerapiya yoki qon almashinuvi boshlanadi [2,7].

Neonatal sariqlikning eng og'ir asorati - bilirubin ensefalopatiyasi. Ushbu holatning dastlabki bosqichlarida letargiya, uyquchanlik, lanjlik va so'rish refleksini pasayishi rivojlanadi. Keyingi davrda qo'zg'aluvchanlik, mushaklarning gipertonusi, ko'p yig'lashi va haroratning ko'tarilishi kuzatiladi. Qaytmas bosqichlarda opistotonus, talvasalar, apnoe, monoton baland ovozda yig'lashi, chuqur stupor yoki koma qayd etiladi [9, 12].

Bilirubin ensefalopatiyasining rivojlanishi uchun xavf omillari orasida neonatal asfiksiya, atsidoz, chala tug'ilish, o'tkir gemoliz, neonatal sariqlik va gipoalbuminemiyani kiritish mumkin [5,20].

Biroq, hozirgi kunga qadar faqat quyidagi omillarning ta'siri ishonchli tarzda isbotlangan: zardobdagi umumiy bilirubinni darajasi 340 mkmol / l dan ortiq (37 hafta yoki undan ortiq homiladorlik davri), zardobdagi umumiy bilirubinning soatlik o'sishi 8,5 mkmol / l dan oshadi va bilirubin ensefalopatiyasining klinik belgilari [18,24].

Qon almashnuvi bilirubin ensefalopatiyasining birinchi belgilari, fototerapiya va intensiv fototerapiya samarasizligi paydo bo'lganda ko'rsatiladi. Asosan yangi tug'ilgan chaqaloqlarda gemolitik kasalligining og'ir kechishida qo'llaniladi [3]. Bugungi kunda neonatal sariqlikni davolashda dori-darmonlarni muntazam qo'llash bo'yicha ilmiy dalillarga asoslangan bazasi yo'q [17,19].

Xorijiy ma'lumotlarga ko'ra, zardobdagi umumiy bilirubinning darajasi 8,5 mkmol/l/soatdan oshgan gemolitik kasallik (rezus va ABO konflikti) holatlarida intensiv fototerapiyadan tashqari har 4 soatda 500 mg/kg immunoglobulinni vena ichiga yuborish tavsiya etiladi [30]. Faqat ona suti bilan oziqlanadigan yangi tug'ilgan chaqaloqlarda sariqlik bilirubinning ikki cho'qqisiga ko'tarilishi mumkin (4-5 va 14-15 kunlar orasida) [1,13]. Bunday hollarda terining sarg'ish rangining intensivligining sekin pasayishi kuzatiladi va sariqlik bolaning hayotining 12-haftasigacha davom etadi. Ushbu sariqlik sog'lom muddatiga yetib tug'ilgan chaqaloqlarda umumiy holatning buzilishi bo'lmasa, dori terapiyasini o'tqazish va emizishni to'xtatishni talab qilmaydi [4,25,26].

Ko'krak sutidan bo'lgan sariqlikning oldini olish uchun ona suti bilan boqish tibbiyot akademiyasi (AQSh) emizishni hayotning 1-soatidan kechiktirmasdan boshlashni, faqat ko'krak suti bilan boqishni qo'llashni, chaqaloqni ona ko'kragiga to'g'ri qo'yish texnikasini ta'minlashni va erkin emizdirishni tavsiya qiladi. Xuddi shu Amerika tavsiyalariga ko'ra, fototerapiya emizishni to'xtatmasdan amalga oshirilishi kerak. Bola 2-3 haftadan katta

bo'lganida, xavf omillari bo'lmasa, fototerapiya uyda o'tkazilishi mumkin. Zardobdagi umumiy bilirubin darajasi terapiya uchun (taxminan 300 mkmol/l) darajasidan 34-51 mkmol/l past bo'lsa, emizishni qisman yoki to'liq almashtirish tavsiya etiladi [27,28,29]. 24-48 soat davomida emizishni to'liq almashtirish samaraliroq bo'ladi, ammo aralashmaning ozgina qo'shilishi ham bog'lanmagan bilirubinning ichakdan so'rilishini kamaytiradi. Bunday holda, oqsil gidrolizatlari bilan aralashmalarni kiritish bolaga samaraliroq bo'ladi. Oziqlantirishni piyola yoki qo'shimcha oziqlantirish tizimidan foydalanish kerak [8,11,16].

LIST OF REFERENCES

[1] Aksenov, D. V., Timofeeva, L. A., & Degtyarev, D. N. (2015). Comparison of the results of invasive and noninvasive methods for diagnosing hyperbilirubinemia in newborns. Neonatology: News. Opinions. Training, (2 (8)), 63-67. https://cyberleninka.ru/article/n/sravnenie-rezultatov-invazivnogo-i-neinvazivnogo-sposobov-diagnostiki-giperbilirubinemii-u-novorozhdennyh

[2] Bozhbanbaeva N. S., Umesheva K. A., Mustafazade T. Sh., Altynbaeva G. B., Mukhambetova G. A., Amantaeva M. E., Yesenova S. A., Apsenov Zh. T. On the problem of prolonged neonatal jaundice // West Kazakhstan Medical Journal. 2015. No. 2 (46). URL: https://cyberleninka.ru/article/n/k-probleme-prolongirovannyh-neonatalnyh-zheltuh (access date: 02/28/2025).

[3] Bokonbaeva, S. D., & Kim, E. G. (2018). Differential diagnostics of neonatal jaundice at the present stage. Bulletin of the Kyrgyz-Russian Slavic University, 18(6), 119-123. http://vestnik.krsu.edu.kg/archive/6/662

[4] Volodin Nikolay Nikolaevich, Degtyarev Dmitry Nikolaevich, Degtyareva Anna Vladimirovna, Karpova Anna Lvovna, Tactics of management of full-term and premature newborns with indirect hyperbilirubinemia (clinical guidelines) // Neonatology: News. Opinions. Training. 2017. No. 2 (16). URL: https://cyberleninka.ru/article/n/taktika-vedeniya-donoshennyh-i-nedonoshennyh-novorozhdennyh-s-nepryamoy-giperbilirubinemiey-klinicheskie-rekomendatsii (date of access: 28.02.2025).

[5] Volyanyuk, E. V. (2016). Algorithm for diagnosis and treatment of prolonged jaundice in children of the first months of life. Bulletin of modern clinical medicine, 9(2), 42-46. https://cyberleninka.ru/article/n/algoritm-diagnostiki-i-lecheniya-prolongirovannoy-zheltuhi-u-detey-pervyh-mesyatsev-zhizni

[6] Volyanyuk, E. V., & Kuznetsova, A. V. (2009). Pediatrician's tactics for neonatal jaundice. Practical medicine, (39), 13-15. https://cyberleninka.ru/article/n/taktika-pediatra-pri-neonatalnoy-zheltuhe

[7] Goryainova, A. N., Antsupova, M. A., & Zakharova, I. N. (2017). Jaundice in a healthy newborn: causes, course, prognosis. Medical council, (19), 120-125. https://cyberleninka.ru/article/n/zheltuhi-zdorovogo-novorozhdennogo-prichiny-techenie-prognoz

[8] Gurina, L. N., Erokhina, I. A., Yusevich, N. S., & Denisik, N. I. (2018). Hyperbilirubinemia in newborns. Medicine: Theory and Practice, 3(1), 27-28. https://cyberleninka.ru/article/n/giperbilirubinemii-u-novorozhdennyh

[9] Degtyareva Anna Vladimirovna, Degtyarev Dmitry Nikolaevich Modern principles of diagnosis and treatment of non-hemolytic hyperbilirubinemia in full-term and late premature infants in the early neonatal period // Neonatology: News. Opinions. Training. 2014. No. 3 (5). URL: https://cyberleninka.ru/article/n/sovremennye-printsipy-diagnostiki-i-lecheniya-negemoliticheskoy-giperbilirubinemii-u-donoshennyh-i-pozdnih-nedonoshennyh-detey-v (date of access: 02/28/2025).

[10] Zhdanova S. I., Vakhitova L. F., Polyakova O. I. A modern view on breastfeeding in neonatal hyperbilirubinemia // MS. 2018. No. 2. URL: https://cyberleninka.ru/article/n/sovremennyy-vzglyad-na-grudnoe-vskarmlivanie-pri-neonatalnyh-giperbilirubinemiyah (accessed: 28.02.2025).

[11] Zakharova, I. N., Goryainova, A. N., Kholodova, I. N., Maikova, I. D., Belenovich, E. V., Tambieva, E. V., ... & Khudyakova, A. A. (2016). Differential diagnosis of jaundice in young children. Medical Council, (7), 56-65. https://doi.org/10.21518/2079-701X-2016-07-56-65

[12] Zvonareva Ekaterina Borisovna, Menshova Alena Viktorovna, Kozhevnikova Elizaveta Vladimirovna, Tarasova Daria Pavlovna THE ROLE OF BREAST MILK IN THE DEVELOPMENT OF UNCONJUGATED JAUNDICE // Scientific news. 2022. No. 29. URL: https://cyberleninka.ru/article/n/rol-grudnogo-moloka-v-razvitii-nekonyugirovannyh-zheltuh (date of access: 02/28/2025).

[13] Ibatulin A. G., Tikhonova O. A. Long-term adaptation of newborn children from mothers with diabetes // Vyatka Medical Bulletin. 2015. No. 2 (46). URL: https://cyberleninka.ru/article/n/dolgovremennaya-adaptatsiya-novorozhdennyh-detey-ot-materey-s-saharnym-diabetom (date of access: 28.02.2025).

[14] Kiselnikova, O. V., Mozzhukhina, L. I., Teyf, V. A., Panova, E. A., Kiselnikova, E. A., & Snigirev, A. A. (2021). Difficulties in diagnosing hyperbilirubinemia syndrome in newborns and young children. EDITORIAL BOARD, 36. https://cyberleninka.ru/article/n/diagnostika-giperbilirubinemii-u-detey-rannego-vozrasta

[15] Lundina, G. V., & Otinova, A. I. (2015). Risk factors and course of neonatal jaundice in premature and low-birth-weight infants. Vyatka Medical Bulletin, (2 (46)), 66-68. https://cyberleninka.ru/article/n/faktory-riska-i-techenie-neonatalnyh-zheltuh-u-nedonoshennyh-i-malovesnyh-novorozhdennyh

[16] Makhsudova Khakimakhon Fayzullaevna, Akbarova Rano Mirzarabovna OPTIMIZATION OF TACTICS OF MANAGEMENT OF NEWBORN CHILDREN WITH CHRONIC HYPERBILIRUBINEMIA // Re-health journal. 2021. No. 3 (11). URL: https://cyberleninka.ru/article/n/optimizatsiya-taktiki-vedeniya-novorozhdennyh-detey-s-hronicheskoy-giperbilirubinemiey (date of access: 28.02.2025).

[17] Mokhova O. G., Kankasova M. N., Pozdeeva O. S. Jaundice syndrome in pediatric practice // PM. 2018. No. 8. URL: https://cyberleninka.ru/article/n/sindrom-zheltuhi-v-praktike-pediatra (date of access: 28.02.2025).

[18] Navruz-zoda, M., & Yuldasheva, G. (2023). INFLUENCE OF GESTATIONAL AGE AND WEIGHT OF LOW-WEIGHT BABY BORN TO MOTHERS WITH PREECLAMSIA ON THE COURSE OF NEONATAL JAUNDICE . International Journal of Scientific Pediatrics, 2(9), 333–335. https://doi.org/10.56121/2181-2926-2023-2-9-333-335

[19] Petruk, N. I., Ovsyannikov, D. Yu., & Bondarenko, N. A. (2017). Jaundice (hyperbilirubinemia) of newborns. Tutorial / N. I. Petruk, D. Yu. Moscow: RUDN University Press, 2017. - 112 p. http://lib.rudn.ru/MegaPro2/Web/SearchResult/ToPage/1

[20] Rakisheva Zh. V., Lepesova M. M. The impact of prolonged neonatal jaundice on the psychomotor development of children in the first year of life. Literature review // Science and Healthcare. 2019. No. 3. URL: https://cyberleninka.ru/article/n/vliyanie-zatyazhnoy-zheltuhi-neonatalnogo-perioda-na-psiho-motornoe-razvitie-detey-pervogo-goda-zhizni-obzor-literatury (date of access: 28.02.2025).

[21] Sirozhiddinova, Kh. N., & Omonova, G. Z. (2024). Central nervous system damage in hemolytic disease of the newborn with intrauterine infection. Journal of Advanced Scientific Research (ISSN: 0976-9595), 5(1). https://sciencesage.info/index.php/jasr/article/view/258

[22] Starets, E. A., Malinovskaya, N. A., & Movlyanova, N. V. (2012). Differential diagnostics and management of neonatal jaundice: current state of the problem. Child health, (3 (38)), 98-102. https://cyberleninka.ru/article/n/differentsialnaya-diagnostika-i-vedenie-neonatalnyh-zheltuh-sovremennoe-sostoyanie-problemy

[23] Tkachenko, A. K., Ustinovich, A. A., Romanova, O. N., Klyuchareva, A. A., & Novak, L. V. (2017). Neonatal jaundice. https://rep.bsmu.by/handle/BSMU/18639

[24] Usmanova, M. F., & Sirozhiddinova, H. N. (2022). Modern approaches to defining hemolytic disease of the newborn. Eurasian Journal of Medical and Natural Sciences, 2(4), 15. https://in-academy.uz/index.php/ejar/article/view/30326

[25] Farmonkulova, Y. R., & Juraeva, H. Z. (2019). Optimization of tactics of management of newborns with prolonged hyperbilirubinemia. New Day in Medicine, (4), 324-327.

[26] Yuldasheva, G., & Navruz-zoda, M. (2023). INFLUENCE OF GESTATIONAL AGE AND WEIGHT OF LOW-BIRTH INFANTS BORN FROM MOTHERS WITH PREECLAMSA ON THE COURSE OF NEONATAL JAUNDICE. International Journal of Scientific Pediatrics, 2(10), 368–371. https://doi.org/10.56121/2181-2926-2023-2-10-368-371

[27] Carolyn G. Scrafford, Luke C. Mullany, Joanne Katz, Subarna K. Khatry, Steven C. LeClerq, Gary L. Darmstadt, James M. Tielsch. Incidence of and Risk Factors for Neonatal Jaundice Among Newborns in Southern Nepal. Trop Med Int Health. Nov 2013. vol. 18. no. 11. P. 1317–1328. https://pubmed.ncbi.nlm.nih.gov/24112359/

[28] Garosi, E., Mohammadi, F., Ranjkesh, F. The Relationship between Neonatal Jaundice and Maternal and Neonatal Factors. Iranian Journal of Neonatology, 2016; 7(1): 37-40. doi: 10.22038/ijn.2016.6663

[29] Mitra, S., & Rennie, J. (2017). Neonatal jaundice: aetiology, diagnosis and

treatment. British journal of hospital medicine (London, England : 2005), 78(12), 699–704. https://doi.org/10.12968/hmed.2017.78.12.699

[30] Zahed Pasha, Y., Alizadeh-Tabari, S., Zahed Pasha, E., & Zamani, M. (2020). Etiology and therapeutic management of neonatal jaundice in Iran: a systematic review and meta-analysis. World journal of pediatrics : WJP, 16(5), 480–493. https://doi.org/10.1007/s12519-020-00339-3