TNF - a NING YALLIG‘LANISH JARAYONIDAGI ROLI VA GURUHLARARO DINAMIK TAHLILI NATIJALARI

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Annotatsiya. O`sma nekroz faktori alfa (TNF - α) – bu organizmdagi yallig‘lanish jarayonlarini boshqarishda muhim rol o‘ynaydigan asosiy proinflammator sitokinlardan biridir TNF - α ni asosan faollashgan makrofaglar, T-limfotsitlar va boshqa immun hujayralar ishlab chiqaradi. Jarohat yoki jarrohlik aralashuvidan so‘ng TNF - α darajasi juda tez oshadi va erta yallig‘lanish javobini shakllantiradi. Tadqiqotlar shuni ko‘rsatadiki, TNF - α boshqa bir qator yallig‘lanish mediatorlarini (masalan, IL-6, IL-8 kabi interleykinlarni) ishlab chiqilishini kuchaytirishi mumkin, shu tariqa yallig‘lanish kaskadini yanada kengaytiradi. Shu sababli TNF - α darajasini aniqlash jarrohlikdan keyingi yallig‘lanish darajasini baholashda muhim biomarker hisoblanadi. TNF - α miqdori yallig‘lanish reaksiyasining kuchi va davomiyligini aks ettirib, jarohat olgan to‘qimalarda immun javob qanchalik kuchayganini ko‘rsatadi. TNF - α ning yallig‘lanish davridagi dinamik o‘zgarishlari. Oddiy sharoitda, jarohat yoki septoplastika jarrohlik amaliyotidan keyin TNF - α darajasi juda tez, bir necha soat ichida ko‘tariladi va taxminan bir sutkada eng yuqori cho‘qqiga yetadi . Keyinchalik, agar asoratlanmagan sog‘ayish jarayoni kechsa, TNF - α sekretsiyasi pasayib boradi – odatda uchinchi kunga kelib sezilarli darajada kamayadi va beshinchi kunga kelib me’yorga yaqinlashadi . TNF - α ning bunday qisqa muddatli cho‘qqi ko‘rinishi uning “erta javob mediatatori” ekanligini, ya’ni jarohatga javoban dastlabki yallig‘lanish bosqichini qo‘zg‘atuvchi vosita ekanligini ko‘rsatadi. Keyingi davrlarda TNF - α pasayishi bilan birga boshqa yallig‘lanish omillar (masalan, interleykinlar) faoliyati ham pasayib, to‘qimalarning tuzalish bosqichiga o‘tiladi. Shu nuqtai nazardan, septoplastika jarrohlik amaliyotidan keyingi davrda TNF - α darajasining qanchalik tez me’yorga qaytishi yallig‘lanishning tezlik bilan bosilishini va shikastlangan to‘qimalarning normal holatga qaytishini bildiradi .

**Kalit so`zlar:** TNF – a o`sma nekrozi omili, interleykin – 6, interleykin – 8, mahalliy yallig`lanish mediatori, septoplastika.

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Аннотация. Фактор некроза опухоли альфа (TNF-α) - один из основных провоспалительных цитокинов, играющий важную роль в регуляции воспалительных процессов в организме. TNF-α вырабатывается преимущественно активированными макрофагами, Т-лимфоцитами и другими иммунными клетками. После травмы или хирургического вмешательства уровень TNF-α очень быстро повышается и формирует ранний воспалительный ответ. Исследования показывают, что TNF-α может усиливать выработку ряда других медиаторов воспаления (например, интерлейкинов, таких как IL-6, IL-8), тем самым еще больше расширяя воспалительный каскад. Поэтому определение уровня TNF-α является важным биомаркером при оценке степени послеоперационного воспаления. Уровень TNF-α отражает силу и продолжительность воспалительной реакции и показывает, насколько усилен иммунный ответ в поврежденных тканях. Динамические изменения TNF-α в период воспаления. В обычных условиях после травмы или операции септопластики уровень TNF-α повышается очень быстро, в течение нескольких часов, и достигает пика примерно через сутки. В дальнейшем, если процесс выздоровления протекает без осложнений, секреция TNF-α снижается - обычно значительно уменьшается к третьему дню и приближается к норме к пятому дню. Такое кратковременное пиковое проявление TNF-α указывает на то, что он является "медиатором раннего ответа," то есть средством, провоцирующим начальную стадию воспаления в ответ на травму. В последующие периоды, наряду со снижением TNF-α, уменьшается активность других факторов воспаления (например, интерлейкинов), и происходит переход к стадии восстановления тканей. С этой точки зрения, скорость нормализации уровня TNF-α в послеоперационном периоде после септопластики указывает на быстрое купирование воспаления и возвращение поврежденных тканей в нормальное состояние.

Ключевые слова: TNF-α фактор некроза опухоли, интерлейкин-6, интерлейкин-8, медиатор местного воспаления, септопластика.

Annotation. Tumor necrosis factor alpha (TNF-α) is one of the main pro-inflammatory cytokines that plays an important role in regulating inflammatory processes in the body. TNF-α is primarily produced by activated macrophages, T-lymphocytes, and other immune cells. Following injury or surgical intervention, TNF-α levels increase rapidly, forming an early inflammatory response. Studies have shown that TNF-α can enhance the production of various other inflammatory mediators (such as interleukins IL-6 and IL-8), thereby further amplifying the inflammatory cascade. Consequently, determining TNF-α levels serves as a crucial

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biomarker in assessing post-operative inflammation. The quantity of TNF-α reflects the intensity and duration of the inflammatory reaction, indicating the degree of enhanced immune response in the affected tissues. Dynamic changes in TNF-α during the inflammatory period**.** Under normal circumstances, following trauma or septoplasty surgery, TNF-α levels rise rapidly within a few hours, peaking at approximately 24 hours. Subsequently, in an uncomplicated recovery process, TNF-α secretion decreases - typically showing a significant reduction by the third day and approaching normal levels by the fifth day. This short-term peak in TNF-α indicates its role as an "early response mediator," initiating the initial stage of inflammation in response to injury. In later stages, as TNF-α levels decrease, the activity of other inflammatory factors (such as interleukins) also diminishes, transitioning to the tissue healing phase. From this perspective, the rapidity with which TNF-α levels return to normal in the post-operative period following septoplasty indicates the swift suppression of inflammation and the return of damaged tissues to their normal state.

Keywords: TNF-α tumor necrosis factor, interleukin-6, interleukin-8, local inflammatory mediator, septoplasty.

KIRISH

Material va metodlar: Tadqiqotda qatnashgan bemorlarning yosh tarkibi quyidagicha edi: 16–23 yosh oralig‘idagi 57 nafar (47.5 %), 24–30 yosh oralig‘idagi 27 nafar (22.5 %), 31–55 yosh oralig‘idagi 36 nafar (30%). Umumiy hisobda 62 nafar (51.7 %) erkak va 58 nafar (48.3 %) ayol tadqiqotga jalb etilgan bo‘lib, bemorlar orasida asosiy kontingentni jins jihatidan deyarli teng taqsimlanishini kuzatish mumkin. Burun bo‘shlig‘i va burun yondosh bo`shliqalarida patologik o‘zgarishlar kuzatilmagan klinik sog‘lom 20 ta ko‘ngilli shaxs nazorat guruhi sifatida qiyoslash uchun tanlab olindi.

Ilmiy izlanish Medilux xususiy klinikasining klinik bazasida amalga oshirildi. Otorinolaringologiya sohasida 2024 yil yanvar-oktabr oylari oralig‘ida 100 nafar bemor va 20 nafar ko`ngilli amaliy sog`lom odamlar tadqiqotga jalb qilindi hamda 3 guruhga bo`lindi.

- **Birinchi guruh:** An’anaviy splint va jarrohlik amaliyotidan keying davri parvarishi protokolini saqlagan 50 nafar bemor
- **Ikkinchi guruh:** Takomillashtirilgan burun splintsi (splint) va postoperatsion parvarish protokolini saqlagan 50 nafar bemor.
- **Nazorat guruhi:** klinik sog‘lom 20 ta ko‘ngilli shaxs nazorat guruhi sifatida qiyosiy tashxislash uchun tanlab olindi.

Asosiy qism: TNF - α darajasining ahamiyati. Ushbu tadqiqotda biz septoplastika jarrohlik amaliyotidan keyin burundagi yallig‘lanish jarayonini

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baholash maqsadida TNF - α darajalarini o‘lchadik. TNF - α tanlab olinishi bejiz emas: u jarrohlik jarohatidan keyingi yallig‘lanishning tezkor va sezgir ko‘rsatkichidir. An’anaviy burun splintsi qo‘yilgan 1-guruh va markaziy ichki havo kanali bilan takomillashtirilgan splint qo‘yilgan 2-guruh bemorlarda TNF - α darajalari dinamikada (1, 5 va 10-kunlarda) kuzatildi. TNF - α orqali biz septoplastika jarrohlik amaliyotidan keyingi burun shilliq qavatidagi yallig‘lanish qanchalik kuchli ekanligini va uning vaqt o‘tishi bilan qay darajada pasayayotganini solishtirish imkoniga ega bo‘ldik. Ilmiy manbalarda keltirilishicha, septoplastika kabi aralashuvlardan so‘ng burun shilliq qavatida yallig‘lanish markerlari, jumladan TNF - α miqdori sezilarli darajada pasayadi . Bu holat burun yo‘llarining normal ventilyatsiyasi tiklanganda va to‘qimalar yaxshiroq drenajlanganda yallig‘lanish reaksiyasi susayishini tasdiqlaydi . Demak, TNF - α darajasini o‘lchash orqali biz yangi splint dizaynining yallig‘lanishga ta’sirini aniqroq baholashimiz mumkin bo‘ladi.

1 – jadval

O`sma nekrozi omili TNF – a dinamikada guruhlar o`rtasidagi dinamik tahlili.

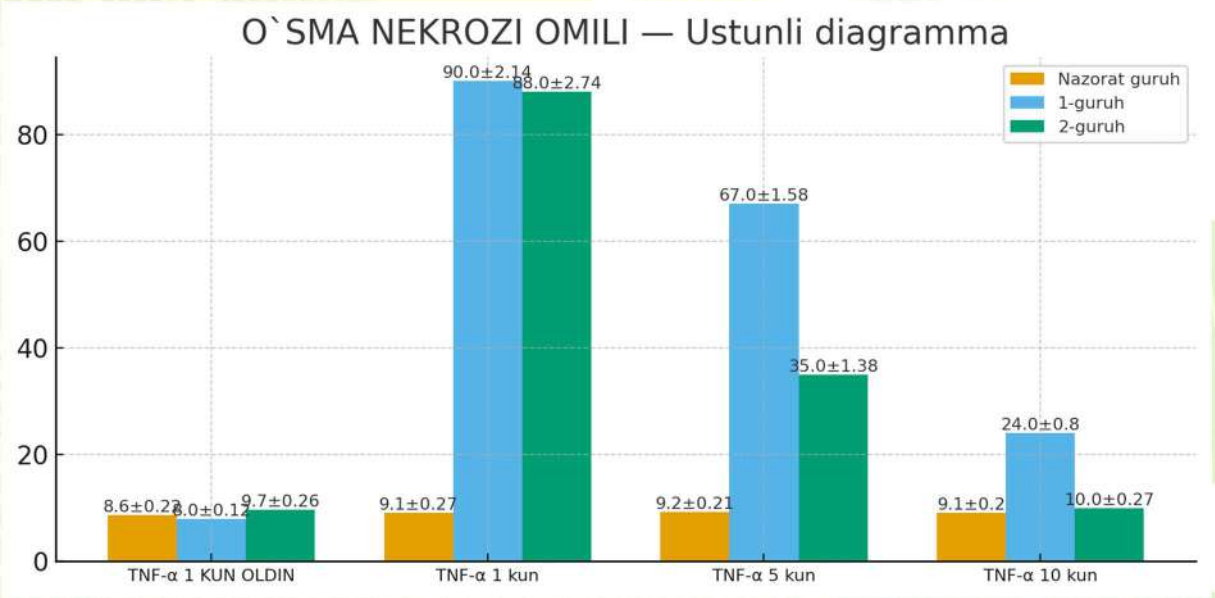
	NAZORAT GURUH	1 GURUH	2 GURUH
TNF-α 1 KUN OLDIN	8.6±0.22	8.0±0.12*	9.7±0.26*,**
TNF-α 1 kun	9.1±0.27	90.0±2.14*	88.0±2.74*
TNF-α 5 kun	9.2±0.21	67.0±1.58*	35.0±1.38*,**
TNF-α 10 kun	9.1±0.2	24.0±0.8*	10.0±0.27*,**

(Izoh: * - nazorat guruhiga nisbatan ishonchlilik darajasi $P < 0.05$, $P < 0.01$, $P < 0.001$, ** - 1 guruhiga nisbatan ishonchlilik darajasi $P < 0.05$, $P < 0.01$, $P < 0.001$)

1 jadvalda o`sma nekrozi omili ko`rsatkichini uchta guruh — nazorat guruh, 1-guruh va 2-guruh — oralaridagi farqlar ko‘rsatilgan bo‘lib, baholash natijalari klinik dinamikani tavsiflaydi. TNF-α 1 KUN OLDIN bo‘yicha nazorat guruhida 8.6±0.22, 1-guruhda 8.0±0.12, 2-guruhda 9.7±0.26, qayd etildi. TNF-α 1 kun bo‘yicha nazorat guruhida 9.1±0.27, 1-guruhda 90.0±2.14, 2-guruhda 88.0±2.74 qayd etildi. TNF-α 5 kun bo‘yicha nazorat guruhida 9.2±0.21, 1-guruhda 67.0±1.58, 2-guruhda 35.0±1.38, qayd etildi. TNF-α 10 kun bo‘yicha nazorat guruhida 9.1±0.2, 1-guruhda 24.0±0.8, 2-guruhda 10.0±0.27, qayd etildi. Keltirilgan jadvalda isnochlilik darajasi hisoblangan. Mazkur holat aniqlangan farqlar tasodifiy emasligini va klinik ahamiyatga ega ekanini ko‘rsatadi. Ko‘rsatkichlar o‘rtasidagi farqlar nafas yo‘llarining o‘tkazuvchanligi, mukosiliar

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klirens, yallig‘lanish darajasi va bemorlarning umumiy funksional holatini aks ettiradi. Nazorat guruh ko‘rsatkichlari shartli ravishda fon sifatida baholanadi. 1-guruh va 2-guruhda kuzatilgan ko‘tarilish yoki pasayishlar jarrohlik amaliyotidan keyingi davrda qo’llanilgan takomillashtirilgan splint va yondashuvlar bilan bog’liq bo’lishi mumkin; bunda burun yo‘llarining o‘tishi yaxshilanib, shish va obstruktsiya kamayadi, bemorning nafas olishi nisbatan yengillashadi. Bunday klinik dinamikani baholash jarrohlikdan keyingi kuzatuv rejalarini individuallashtirishga, qayta ko‘rik vaqtlarini to‘g‘ri tanlashga va zarur bo‘lsa qo‘shimcha davo choralarini erta kiritishga yordam beradi. Ko‘rsatkichlarning ketma-ket o‘zgarishi qisqa muddatli tiklanish sur’ati va yallig‘lanish reaktsiyasining qanday boshqarilayotganini ochib beradi. Ushbu ma’lumotlar bemorlarning subyektiv shikoyatlari va obyektiv ko‘rsatkichlari o‘rtasidagi moslikni hujjatlashtirish uchun muhimdir. Klinik talqin jarayonida har bir guruhda qanday tezlikda normallashuv ro‘y berayotgani va qaysi ko‘rsatkichlar nisbatan sekin tiklanayotgani alohida e’tiborga olinadi.



1 – diagramma: o`sma nekrozi omilining ishonchlilik darajasi tahlili

1 diagrammada klinik ko‘rsatkichlarning uch guruh o‘rtasidagi taqsimotini va ularning qisqa muddatdagi dinamikasini tasvirlaydi. Natijalar jarrohlik amaliyotidan oldingi bosqichdan boshlab ilk kunlardan boshlab 5-kun va 10-kungacha bo‘lgan tiklanish jarayonini aks ettiradi. TNF-α 1 KUN OLDIN bo‘yicha ko‘rsatkichlar shunday taqsimlangan: Nazorat guruh 8.6±0.22, 1-guruh 8.0±0.12, 2-guruh 9.7±0.26,. TNF-α 1 kun bo‘yicha ko‘rsatkichlar shunday taqsimlangan: Nazorat guruh 9.1±0.27, 1-guruh 90.0±2.14, 2-guruh 88.0±2.74. TNF-α 5 kun bo‘yicha ko‘rsatkichlar shunday taqsimlangan: Nazorat guruh 9.2±0.21, 1-guruh 67.0±1.58, 2-guruh 35.0±1.38,. TNF-α 10 kun bo‘yicha ko‘rsatkichlar shunday taqsimlangan: Nazorat guruh 9.1±0.2, 1-guruh 24.0±0.8, 2-guruh 10.0±0.27,.

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XULOSA qilib aytganda, TNF - α ni septoplastika jarrohlik amaliyotidan keyin dinamik kuzatish orqali yallig‘lanish jarayonining borishi va qo‘llangan davolash-uskunalarning (bizning holatda – burun splintsi turining) samaradorligini baholash mumkin. Bizning tajribamizda takomillashtirilgan burun splintsi yallig‘lanish javobini susaytirib, bemorlarning sog‘ayish jarayonini tezlashtirganini TNF - α ko‘rsatkichlarining tezroq normallashgani orqali ko‘rish mumkin bo‘ldi.

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