

Turkish Clinicians Opinions About COVID Treatment in 2nd and 3rd Level Hospitals What Did Change from 2021 to 2022? Results of 2 Years of Follow-up

İkinci ve Üçüncü Basamak Hastanelerin COVID Kliniklerinde Çalışan Doktorların Tedavi Seçeneklerine Bakışı 2021'den 2022 ye Ne Değişti? 2 Yıllık İzlemin Sonuçları

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Abstract

Objective: To determine the change in opinion about the treatment options of Turkish doctors who fight Coronavirus (COVID) in 2nd and 3rd level hospitals.

Method: A questionnaire comprised of 14 questions is asked to clinicians who worked in COVID clinics of 2nd and 3rd level hospitals in March 2021 and March 2022.

Results: Prednisolone, IV use of 60 and 80 mg when added to standart therapies was observed more effective in 2022 than in 2021. Also, use of high doses of prednisolone (250 mg and higher) was also found more effective in 2022 than 2021. Acetyl salicylic acide (ASA) is used in routine treatment in both years, but there was a small decline of trust level in its effectiveness in 2022 than in 2021. Low molecular weight heparine, (especially enoxaparine) is also used in the treatment of COVID for both years and a relatively small decline of trust in its effectiveness was observed in 2022 than in 2021. For vaccines, use of BIONTECH was the golden choice of clinicians for themselves and to be used for their relatives.

Conclusion: During the pandemic, clinicians tried to find the right treatment option to gain control over COVID, at the end of almost 3 years, it is well understood that there was no specific treatment but vaccines, steroids, ASA, low molecular weight heparin were the best agents to be used to help COVID patients not to decline to more severe conditions. In Turkey, after our study we can conclude that Turkish clinicians used the similar treatment options and vaccines as their global colleagues and found those agents effective than the other options.

Keywords: Clinicians, COVID, opinion, options, treatment

Öz

Amaç: İkinci ve üçüncü basamak hastanelerin Koronavirüs (COVID) servislerinde çalışan hekimlerin 2 yıl içinde sağaltım seçeneklerine bakışlarındaki değişiklikleri belirlemektir.

Yöntem: On dört soruluk bir test 2021 ve 2022'nin Mart aylarında 2. ve 3. derece hastanelerimizin COVID kliniklerinde çalışan doktorlarına gönüllük esasına dayanarak uygulandı.

Bulgular: Prednizolon IV 60 VE 80 mg'nin standart tedavilere eklenmesi 2022 de 2021'e göre daha etkin bulundu. Ayrıca 250 mg ve üstü doz steroid uygulanması da 2022'de daha üstün bulundu. Asetilsalisilik asit (ASA) uygulanması her 2 yılda da etkin görülse de 2022'de güven aralığı biraz azalmış olarak gözlemlendi. Düşük moleküler ağırlıklı heparin ve özellikle enoksaparin her 2 yılda da uygulanmış ve 2022 de 2021'e göre etkinlik açısından daha güvenilir bulunmuştur. Aşılar güven açısından en güvenilir aşı BIONTECH olarak gözlemlenmiştir.

Sonuç: Tüm pandemi boyunca dünyada hekimler COVID'e karşı pek çok ilaç denemişlerdir. Sonuçta standart tedavilere ek olarak aşılar, steroid, ASA, düşük moleküler ağırlıklı heparin en güvenilir sonuçları vermiştir. Ülkemizde de çalışmamızın sonucunda, COVID kliniklerinde çalışan doktorlar da küresel meslektaşlarıyla aynı tedavileri uygulamış ve aynı ilaçları sağaltımda güvenilir bulmuşlardır.

Anahtar kelimeler: COVID, klinisyen, seçenek, tedavi, tercih



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Introduction

In 2023, globally, we are aimed to think that COVID pandemic is now not a very big concern in our life after 2 years of global fighting against it. But can it really be concluded as it? In August 2023 World Health Organization (WHO) warned the member countries about the new variant of COVID named ERIS due to its severe potential.

We tried many options in the treatment but not a specific agent has been found to be the right choice. Coronaviruses (CoV) are a very big virus family which can cause diseases from flu like syndrome and self restricting mild infections to more and deadly severe status like middle east respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS) (1).

CoV have sub classes in humans which can pass easily from one patient to another (like HCoV- 229E, HCoV- 0C43, HCoV- NL63 and HKU1- CoV) (1).

SARS-CoV, an unknown virus has emerged in 2003, as the first international health emergency state which caused hundreds of deads. After 10 years MERS-CoV a member of COVID family which was unidentified neither in human nor in animals was identified in humans in Saudi Arabia and after that it was understood that first cases were in an hospital in Zarka, Jordan, April 2012 (1).

31 December 2019, China Office of WHO announced pneumonia cases of unknown origin in Wuhan city of Hubei state. At 7th of January 2020, the cause is declared as a new CoV (2019-nCoV) which wasn't identified in human before (1).

2019-nCoV was later named Coronavirus disease-2019 (COVID-19) and due to its similarity to SARS-CoV it is then named as SARS-CoV-2.

After the spread of the virus to 113 other countries WHO declared the infection as a pandemic in 11th of March 2020.

In Turkey first meeting of Council of scientific advise council of ministry of health came together in 22nd of January 2020 (1).

First confirmed Turkish case is declared in 11st of March 2020. Symptoms mostly are fever, cough, dispnea. Headache, soar throat, nausea, muscle and joint pain, dizziness, loss of smell and taste and diarrhea can be seen also.

From asymptomatic status to severe pneumonia and lower respiratory tract infection, renal failure and death can be seen (1).

SARS-CoV-2 has been diagnosed in March 2020 but no specific antivirus treatment is confirmed to be succesfull since then (2).

Molnupavir treatment is recommended in patients (>18 years of age) with confirmed polymerase chain reaction, with low and medium severity, in the first five days of symptoms, and in patients with possibly of getting severe status with no regard of vaccination levels (2,3).

During the early stages of pandemic, it was advised to avoid using the steroids unless there is acute respiratory distress syndrome or resisant shock status (0.5-1 mg/kg doses of prednisolone in those cases only as advised in ESICM) (2-4).

Today, based on randomised controlled studies, the use of glucocorticoids in patients with severe breathing needs is needed to augment the chance of survival and to shorten the stay in hospital (2-4).

In case of patients with COVID related MAS, tocilizumab (IL-6 blocker) and anakinra (IL-1 blocker) can be used if steroid treatment is not enough (2-4).

In patients with no respons to anti- cytokine treatment the use of janus kinase inhibitors (ruksonotinib etc.) is advised (4-6).

Intravenous immunoglobulin treatment in adult patients, with the control of Ig levels (not to be used in IgA defficiency) is advised with the doses of 20 gr/day for 5 days, if clinically needed. Always remembering that 2 gr/kg/day dose can cause severe overdosing symptoms (5,6).

In COVID patients venous and arterial thromboembolic events can occur due to various mechanisms (7).

Low molecular weight heparin (enoxaparine) is advised more than standart heparine because it causes less thrombocytopenia and less injection is needed (7,8).

Dipridamol can be used in the treatment at the doses of 2x75 mg P.O. in the first 14 days of disease because it reduces the replication rate and viral load. It also has anti-aggregan and anti-inflammatory effects. Hypotension can be seen in some patients (8).

Aspirin, when used in 100 mg P.O. dose, there are studies showing that it reduces the lung damage effect of the disease (8).

Favipravir 200 mg P.O. osetalmivir 30 mg -45 mg-75 mg P.O. lopinavir 200 mg/ritonavir 50 mg P.O. are also used in the treatment but no enough benefits are shown (9-11).

Materials and Methods

In our study we tried to evaluate the opinion about the treatment options and changes of preferences of COVID treating Turkish doctors working in 2nd and 3rd degree hospitals during 2 years of follow-up. A questionnaire comprised of 14 questions is asked to clinicians in March 2021 and March 2022. Ethics committee permission of University of Health Sciences Turkey, İstanbul Haseki Training and Research Hospital is dated 19.01.2022 and the code is 134-2021.

Statistical Analysis

The tests were sent to clinicians who joined the study voluntarily. The lowest number of participant was calculated as 25 for each year for statistical efficacy. The results were collected with data alchemer, and the results are analyzed with IBM SPSS.

Results

In 2021 107 (69 female and 38 male), (60 from family medicine, 10 from infectious disease clinic, 24 from internal medicine, 6 anesthesiologists, 4 from pulmonary diseases clinic, 1 cardiologist, 2 practitioner from COVID clinic) and in 2022, 114 (71 female and 43 male) (59 from family medicine clinic, 6 from infectious diseases clinic, 24 from internal medicine clinic, 9 from emergency clinic, 9 anesthesiologists, 4 from pulmonary diseases clinic, 2 urologists and 1 surgeon) doctors filled the questionnaire.

All doctors answering the questions were working in COVID clinics. In 2021, the use of hydroxycloquine was dominant in out and inpatient clinics (7.4% and 29%) but in 2022 it was almost out of use because it was totally deleted from protocols due to its side effects and uneffectiveness (87% of clinicians were not trusting outpatient effect and 88.6% of untrustiness to inpatient use).

Favipravir was also used very frequently 2021 but in 2022 a straight decline was observed due to study results about its side effects and uneffectiveness and self experiences (trust to its effectiveness declined from 64.5% in 2021 to 14.5% in 2022).

Tocilizumab, use and trust to its effectiveness was very high in both years (80.4% in 2021, 89.7% in 2022).

Anakinra also was used in clinics in patients with severe symptoms and in macrophage activation syndrome (MAS) and was found effective in both years (81.3% in 2021 and 82.5% in 2022).

Dexamethasone use and trust in its effectiveness was higher in 2022 than in 2021 (88.8% in 2021 and 90.4% in 2022).

Prednisolone, IV use of 60 and 80 mg when added to standart therapies was observed more effective in 2022 than in 2021 (for 60 mg IV use, in 2021, 82.2% and in 2022, 85.1% trust levels were found. For 80 mg IV use, in 2021, 50.4%, in 2022, 84.2%).

Also, use of high doses of prednisolone (250 mg and higher) in patients with severe pulmonary symptoms and MAS. It was confidently used in both years (clinicians trust levels; 74.7% in 2021 and in 2022, 74.6%).

ASA is used in routine treatment in both years. But there was a decline of thrust in its effectiveness in 2022 than in 2021 (60.7% in 2021 to 57% in 2022).

Low molecular weight heparine (LMWH), (especially enoxaparine) is also used in the treatment of COVID for both years and an obvious augmentation of trust to its effectiveness was observed in 2022 more than in 2021 (trust to its effectiveness, 88.6% in 2021 and in 2022, 93.9%).

For vaccines, use of BIONTECH is dominantly preferred by doctors, for themselves and to be used for their relatives (In 2021, 37.4% of clinicians have chosen it and in 2022, 81.6%. In 2021 the percentage of clinicians who have chosen sinovac was 62.6% and in 2022, it was 11.4%). For outpatients of 55 years and older, molnupavir is advised but during our study it wasn't in use.

Discussion

Since the beginning of COVID pandemic, clinicians worked hard to find an effective treatment to stop the virus. A lot of medicaments of every class that could be usefull are applied to patients but at the end of almost 3 years it was obvious that there was no specific treatment to cure it. But some medicaments were found usefull to help the patients who intend to worsen.

In our study we tried to collect datas of clinicians of 2nd and 3rd level hospitals who worked in COVID sections and their opinion about the pharmacologic options that they used to treat patients (Tables 1-3).

The first drug was hidroxychlorokine. In 2021 quite high levels of its use was observed but in 2022 it was no longer in use in Turkey due to its side effects and uneffectiveness. Also during the trials in Brasil, France side effects like QT prolongation and sudden death was observed and it was out of use globally (12). In our study also its use was strictly declined in 2022 than 2021 (Table 4).

For favipravir, its use was in high levels in 2021 because it was thought that it could help patients to get saved of COVID but in 2022 an obvious and clear diminution of its use was observed due to study results all around the World (13) and national experiences. Our results were similar, in 2022 it was almost out of procedures (Table 5).

Tocilizumab use and its effectiveness were very high in both years. Also, IL-6 receptor blocker Tosilizumab is used

Table 1. Evaluation of Turkish clinicians opinion for COVID treatment options

Statistical analysis				
Answer statistics				
	1 st period		2 nd period	
Completed	100.00%	107	100.00%	114
Partial	0.00%	0	0.00%	0
Refused	0.00%	0	0.00%	0
Total	100.00%	107	100.00%	114

COVID: Coronavirus

Table 2. Evaluation of Turkish clinicians opinion for COVID treatment options

Gender				
	1 st period		2 nd period	
Female	64.50%	69	62.30%	71
Male	35.50%	38	37.70%	43
Total	100.00%	107	100.00%	114

COVID: Coronavirus

Table 3. Evaluation of Turkish clinicians opinion for COVID treatment options

Treating COVID confirmation				
	1 st period		2 nd period	
Yes	100.00%	107	100.00%	114
Total	100.00%	107	100.00%	114

COVID: Coronavirus

Table 4. Clinicians opinion about using hydroxycloquine in the treatment of COVID

	Definetly trust		Trust		Neither trust nor not trust		Don't trust		Definetely don't trust											
	1 st period		2 nd period		1 st period		2 nd period		1 st period		2 nd period									
	n	%	n	%	n	%	n	%	n	%	n	%								
Outpatients only	1	0.9%	0	0.00%	7	6.5%	1	0.90%	35	32.7%	13	11.40%	42	39.3%	51	44.70%	22	20.6%	49	43.00%
Monotherapy inpatient	0	%	0	0.00%	3	2.8%	0	0.00%	37	34.6%	13	11.40%	47	43.9%	47	41.20%	20	18.7%	54	47.40%
Inpatient, combined with steroid	1	0.9%	0	0.00%	28	26.2%	15	13.20%	35	32.7%	30	26.30%	31	29.0%	35	30.70%	12	11.2%	34	29.80%

COVID: Coronavirus

for severe patients with COVID in almost all the clinics globally and couraging results were added to literature (14). In our study also, clinicians concluded that tocilizumab was effective in severe pulmonary disease and also in MAS (Table 6, 7).

Khani et al. (15) in their study explained that anakinra which is a IL-1 receptor blocker, can be more beneficial in the early stages of the disease when higher levels of cytokines are yet to be observed, which could prevent progression to severe illness and mechanical ventilation. Four items are shown to be important for achieving the optimal therapeutic effects of anakinra in COVID-19 patients. These items include duration of treatment ≥ 10 days, doses ≥ 100 mg, intravenous administration, and early initiation of therapy (15). In our study, we have concluded that in 2021 and specially in 2022 in Turkey, clinicians were in favor of its use based on such datas (Table 8, 9).

Dexamethasone and methylprednisolone (in multiple doses as 60 mg, 80 mg) use were augmented during the pandemic and it was observed that their use in patients with severe pulmonary symptoms and possibly declining to MAS were in favor for the patient. Its use was favored all around the world after study results. Engel et al. (16) described the anti-inflammatory impact of dexamethasone on the pathways contributing to cytokine hyperresponsiveness observed in severe manifestations of COVID-19, including type I/II IFN signaling. They remarked that dexamethasone could have adverse effects in COVID-19 patients with mild symptoms by inhibiting IFN responses in early stages of the disease, whereas it exhibited beneficial effects in patients with severe clinical phenotypes by efficiently diminishing cytokine hyperresponsiveness. That results were similar to our study results showing that in 2022 their use were more obvious than 2021 (Table 10, 11).

Table 5. Clinicians opinion about favipravir use in the treatment of COVID

	Definetly trust		Trust		Neither trust nor not trust		Don't trust		Definetely don't trust											
	1 st period		2 nd period		1 st period		2 nd period		1 st period		2 nd period									
	n	%	n	%	n	%	n	%	n	%	n	%								
Inpatients, combined with steroid	9	8.4%	4	3.50%	77	72.0%	23	20.20%	17	15.9%	42	36.80%	4	3.7%	31	27.20%	0	%	14	12.30%
Monotherapy, inpatient	6	5.6%	1	0.90%	63	58.9%	16	14.00%	30	28.0%	35	30.70%	7	6.5%	42	36.80%	1	0.9%	20	17.50%
At home.mono	6	5.6%	0	0.00%	64	59.8%	18	15.80%	26	24.3%	34	29.80%	9	8.4%	42	36.80%	2	1.9%	20	17.50%

COVID: Coronavirus

Pinzón et al. (17) showed that, the treatment of severe COVID-19 pneumonia with high-dose methylprednisolone for three days followed by oral prednisone for 14 days, compared with 6 mg dexamethasone for 7 to 10 days, statistically significantly decreased the recovery time, the need for transfer to intensive care and the severity markers C-reactive protein, D-dimer and LDH.

Table 6. Use of tocilizumab for the COVID patients with no respons to routine therapy or general status worsening

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Yes, applied	52.30%	56	58.80%	67
No, I did not applied	35.50%	38	32.50%	37
I do not know	12.10%	13	8.80%	10
Total	100.00%	107	100.0%	114

COVID: Coronavirus

Table 7. Clinicians opinion about tocilizumab treatment effectiveness in the treatment of COVID

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Yes	80.40%	45	89.70%	61
No	8.90%	5	5.90%	4
I do not know	10.70%	6	4.40%	3
Total	100.00%	56	100.00%	68

COVID: Coronavirus

Table 8. Use of anakinra for the COVID patients with no respons to routine therapy or general status worsening

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Yes, applied	29.90%	32	54.40%	62
No, not applied	58.90%	63	37.70%	43
I do not know	11.20%	12	7.90%	9
Total	100.00%	107	100.00%	114

COVID: Coronavirus

In our study, in 2022 (more clearly than 2021), clinicians were adapted to use these doses also (Table 12, 13).

About LMWH; Spyropoulos et al. (18) in their randomized clinical trial, showed that therapeutic-dose LMWH reduced major thromboembolism and death compared with institutional standard heparin thromboprophylaxis among inpatients with COVID-19 with very elevated D-dimer levels. In our study also, clinicians are observed trusting to LMWH's effectiveness in protecting COVID patients from thromboembolic side effects (Table 14).

Tantry et al. (19), in their study explained that, aspirin targets the intracellular signaling pathway that is essential for viral replication, and resultant inflammatory

Table 9. Clinician's opinion about Anakinra's effectiveness in the treatment of COVID

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Yes	81.30%	26	82.50%	52
No	6.30%	2	11.10%	7
I do not know	12.50%	4	6.30%	4
Total	100.00%	32	100.00%	63

COVID: Coronavirus

Table 10. Opinion about dexamethasone's effectiveness in the treatment of COVID?

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Definetely trust	24.30%	26	29.80%	34
Trust	64.50%	69	60.50%	69
Neither trust nor not trust	11.20%	12	7.00%	8
Don't trust	0.00%	0	0.90%	1
Definetely don't trust	0.00%	0	1.80%	2
Total	100.00%	107	100.00%	114

COVID: Coronavirus

Table 11. Clinician's opinion about the effectiveness of methyl prednisolone in COVID patients

	Definetly trust		Trust		Neither trust nor not trust		Don't trust		Definetely don't trust											
	1 st period	2 nd period	1 st period	2 nd period	1 st period	2 nd period	1 st period	2 nd period	1 st period	2 nd period										
	n	%	n	%	n	%	n	%	n	%										
60 mg IV	21	19.6%	35	30.70%	67	62.6%	62	54.40%	17	15.9%	15	13.20%	0	1.9%	0	0.00%	0	0%	2	1.80%
80 mg IV	22	20.6%	34	29.80%	70	65.4%	62	54.40%	11	10.3%	16	14.00%	4	3.7%	0	0.00%	0	0%	2	1.80%

COVID: Coronavirus

responses, hypercoagulability, and platelet activation. With these multiple benefits, aspirin can be a credible adjunctive therapeutic option for the treatment of COVID-19. In addition, inhaled formulation with its rapid effects may enhance direct delivery to the lung, which is the key organ damaged in COVID-19 during the critical initial course of the disease, whereas the 150-325 mg/day can be used for long-term treatment to prevent thrombotic event occurrences. Being economical and widely available, aspirin can be exploited globally, particularly in underserved communities and remote areas of the world to combat the ongoing COVID-19 pandemic (19). In our study also ASA is used in routine treatment in both years. But there was

a diminishing pattern of trust to its effectiveness in 2022 regarding to 2021 (Table 15).

Finally for the vaccinnese; since antiquity clinicians are aware of the effectiveness of vaccination versus disease. It is obvious about COVID also as it is a pandemic caused with virus. The search for an effective vaccine versus COVID was the main concern of all the researchers all aorund the World. After a period of research and studies 4 main vaccines were globally accepted effective and started to be applied to citizens. In Turkey, first Sinovac then like almost all around the World, Biontech and at last Turkovac was applied.

Graña et al. (20) in their study concluded that; compared to placebo, most vaccines reduce, or likely reduce, the proportion of participants with confirmed symptomatic

Table 12. Clinician opinion about the use of pulse steroid treatment (250 mg and higher) in COVID patients

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Definetly trust	30.80%	33	31.60%	36
Trust	43.90%	47	43.00%	49
Neither trust nor not trust	19.60%	21	19.30%	22
Don't trust	5.60%	6	4.40%	5
	0.00%	0	1.80%	2
Total	100.00%	107	100.00%	114

COVID: Coronavirus

Table 13. Opinion about the use of ASA in patients with COVID disease

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Definetly trust	12.10%	13	10.50%	12
Trust	48.60%	52	46.50%	53
Neither trust nor not trust	29.90%	32	30.70%	35
Don't trust	7.50%	8	8.80%	10
Definetely don't trust	1.90%	2	3.50%	4
Total	100.00%	107	100.00%	114

COVID: Coronavirus

Table 14. Opinion about the use of low molecular weight heparine in the treatment of COVID patients

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Definetly trust	46.70%	50	39.50%	45
Trust	43.90%	47	54.40%	62
Neither trust nor not trust	8.40%	9	4.40%	5
Don't trust	0.90%	1	0.00%	0
Definetely don't trust	0.00%	0	180%	2

COVID: Coronavirus

Table 15. Vaccine preferation to be used for self and relatives against COVID

Statement	1 st period		2 nd period	
	Percentage	n	Percentage	n
Sinovac	62.60%	67	11.40%	13
Pfizer Biontech	37.40%	40	81.60%	93
Astra Zeneca	0.00%	0	0.90%	1
Moderna	0.00%	0	2.60%	3
Turkovac	0.00%	0	3.50%	4
Total	100.00%	107	100.00%	114

COVID: Coronavirus

COVID-19, and for some, there is high-certainty evidence that they reduce severe or critical disease. There is probably little or no difference between most vaccines and placebo for serious adverse events. Over 300 registered RCTs are evaluating the efficacy of COVID-19 vaccines, and this review is updated regularly on the COVID-NMA platform (covid-nma.com). Implications for practice Due to the trial exclusions, these results cannot be generalized to pregnant women, individuals with a history of SARS-CoV-2 infection, or immunocompromized people. Most trials had a short follow-up and were conducted before the emergence of variants of concern. Implications for research Future research should evaluate the long-term effect of vaccines, compare different vaccines and vaccine schedules, assess vaccine efficacy and safety in specific populations, and include outcomes such as preventing long COVID-19.

Ongoing evaluation of vaccine efficacy and effectiveness against emerging variants of concern is also vital (20).

In our study we observed that BIONTECH was the favorite vaccine chosen by our clinicians to be used for themselves and relatives from 2021 to 2022.

Study Limitations

About our study's limitation we can admit that the number of participants to our clinic study is enough for making a first step to understand Turkish clinicians opinion about their treatment options for COVID, studies with larger numbers of clinicians would be more precise. Also with more participants we can analyse if there is statistical differences in their opinion regarding to their medical branches but also as the COVID treatment protocols are clear and standartised for all clinicians in the world and in Turkey, maybe it will not be needed. For our study there was no statistical difference in clinicians number between 2 years but as we mentioned before, studies with more clinicians can precisely show each clinics opinion about their options for COVID treatment.

Conclusion

Our results showed that, the opinion about the treatment choices of Turkish doctors who work in COVID clinics of 2nd and 3rd degree hospitals are similar to their global colleagues.

From 2021 to 2022 LMWH, ASA, steroid use is augmented due to the study results and clinical observations of their effectiveness in the treatment of COVID. Also after 2 years, there is no specific antiviral treatment option for COVID and the suspicions about the effectiveness of routine

antiviral drugs such as favipravir or remdesevir etc. is still a medical problem to be solved.

Anakinra and tocilizumab were used in patients with severe symptoms and MAS and were found effective in higher levels both in 2022 than in 2021.

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Ethics

Ethics Committee Approval: Ethics committee permission of University of Health Sciences Turkey, İstanbul Haseki Training and Research Hospital is dated 19.01.2022 and the code is 134-2021.

Informed Consent: Not needed for this study.

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