Covid19's Pathogenesis, Symptoms, AND Severity AMONG Physicians IN Iraq

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Abstract:

Coronavirus or COVID-19, is relate to the contagious agent which is spurred on by the SARS-CoV-2 virus. Typical symptoms of this virus comprise high body temperature, coughing, breathing issues, tiredness, headaches, loss of smell and taste. **Aim**: The goal of the study is to learn more about COVID19's pathogenesis, symptoms, severity, and prognosis among Iraqi physicians. **Subject and method:** From the 17th of December 2020 to the 19th of March 2021, a cross-sectional research was performed in Iraq. Only physicians were present for the experiment, which was conducted on 103 people. **Results**: 55 % suffer respiratory symptoms, 48 % experience general symptoms, the majority of the severity of the GIT symptoms 44% was severe, but the nervous symptoms were thought to be of light severity among the physicians. Patients with covid-19 who had dyspnea 40%, and the patients who did not have dyspnea were 45 %. large number of participants undergo fever (95%), and the relatively low percentage of subjects without fever (5%).High percentage of patients experience cough (85%) and the low percentage of patients without cough (15%). significant number of patients who experience shortness of breath (77%) and the remainder (23%), who do not experience shortness of breath. significant number of patients who can smell (89%) whereas Anosmia affects just 11% of the population. While majority of the people can taste (86%) and who acquire Ageusia (14%).

Key word: Covid- 19 , physiopathology of Covid- 19, Covid- 19 symptoms .

Introduction:

Novel Coronavirus-2 (COVID-19) is a source of severe acute respiratory syndrome which is an infectious disease (1).elevated body temperature, breathing hardship, cough, fatigue, headache, loss of taste and smell are popular symptoms of covid-19. Regarding viral exposure, symptoms may arise within one day to two weeks' time (2). Nevertheless, around one of three persons infected by the disease demonstrates no symptoms at all. A large percentage about (81%) of individuals who suffering mild to serious symptoms are considered to be patients do so (up to mild pneumonia), Despite the fact that 14% of patients have obvious complications (shortness of breath, hypoxia, or even over 50% lung involvement on imaging), while 5% show signs that could be fatal (respiratory failure, shock, or multi-organ failure (3).

Signs and symptoms

The characteristic features are headache, loss of taste and smell, runny or clogged nose, cough, muscle soreness, dry mouth, increased body temperature, diarrhea, and respiratory issues (4). The symptoms that perhaps a person who carries the same virus may undergo differ, and they may change as time passes (5). a group of signs in the respiratory system, comprising cough, mucous, breathing difficulty, and fever; a group of

problems in the muscular system, encompassing joint and muscle pain , headache, and lethargy; But on the other hand, a collection of gastrointestinal problems involving nausea, vomiting, and diarrhea has been identified (6). Loss of smell and taste in those who have never experienced any nose, ear or throat issues is associated with COVID-19 (7).

Transmission:

People mostly catch the virus through their nasal passages, breathing droplets and particles which are released while they breathe, sneeze, cough, or talk, by infected individuals. COVID-19 virus can spread across greater space, especially interior, but it is more frequently transmitted when people come into close proximity and stay together for a long time(8). The dimension of the infectious particles varies from tiny airborne particles that hang stationary in the atmosphere for a long time to larger particles where it can simply remain in the atmosphere or descend to the floor(9). This transition between droplets and particles has altered the traditional knowledge of how respiratory infections spread (9).

When Persons are in close proximity to one another, the spread of infection is more probable, which seems to be more prone to transmit when humans are in close proximity to each other. Insufficient ventilation weather conditions are more conducive to long-distance disease dispersion. In some situations, tiny particles can remain suspended in the atmosphere for minutes to several hours (10). Individuals are often contagious when they start to show symptoms, although they can be dangerous for as long as three days before it. Within a week, the human risk of transmission decreases, but if they haven't acquired any symptoms, they can still transmit the virus for up to 20 days (11). Only low percentage of those who spread the disease is accountable, and the rate of individuals who are harmed by a single sick human varies. Infection

may take place if bronchial discharges come into touch with soft tissues in the mouth, nose, or eyes. By coming into contact with an infected material's surface before touching one's nose, mouth, or eyes, person can accidentally contract the disease, while a wealth of evidence indicates that this has no effect on the spread of illnesses (10). No concrete evidence of the disease spreading through skin-to-skin contact has been discovered, despite the possibility. It is mostly very infrequently passed from mother to fetus while pregnant and does not know to be transmitted via feces, body fluids, food, wastewater, or potable water (12).

Pathophysiology

COVID-19 has the potential to damage the respiratory system. Apparently, the respiratory system is the organ most affected by COVID-19 because the virus attacks healthy cells often through the receptor for the enzyme angiotensin-converting enzyme 2 (ACE2), which is found most commonly on the wall of type II alveolar cells in the lungs. A special surface glycoprotein known as a "spike" (peplomer) is used by the virus to bind to the ACE2 receptor and penetrate the human host (13).

Most COVID-19 patients with central nervous system issues have CNS testing negative for the pathogen. Low quantities of virus were being discovered in the brain tissue of the patients, but these observations require to be confirmed (14). The supporting cells of an olfactory epithelium get infected, causing damage to the olfactory neurons and resulting in the loss of scent (15). Middle East respiratory syndrome may cause respiratory arrest by damaging the central nervous system, similar to how other coronaviruses have been known to reach the nervous system. Cerebrospinal fluid from biopsies contained the virus, but the manner of infection of CNS is still uncertain. Since ACE2 is only mildly prevalent in the brain, this could

initially impact sensory neurons (15). The pathogen might conceivably reach the bloodstream through the respiratory system, cross the blood-brain barrier, then move on to the central nervous system (CNS), possibly through an infected white blood cell (16). While ACE2 is abundant in the gastro intestinal epithelium, the pathogen has a considerable negative influence on these cells. (17). The pathogen seems to have the capacity to cause both short-term damage to the cardiovascular system and hard infarction. Cardiovascular symptoms are common due to the inflammatory response and immunological issues that develop as the disease worsens, and acute myocardial injury can be related to ACE2 receptors within the heart (18). Blood vascular degeneration and thrombus formation (as evidenced by elevated D-dimer levels) are thought to have a substantial impact on mortality in SARS-CoV-2-infected individuals. Both ischemic brain lesions and blood clots causing pulmonary embolisms were identified as consequences that can be fatal. Vasoconstriction has been suggested as a mechanism by which oxygenation declines when viral pneumonia is occurring; infection appears to set off a sequence of vasoconstrictive reactions in the body (19). Renal problems are still additional prominent occasion of death. According to preliminary assessments, up to one third of hospitalized patients in some countries, including those without a history of kidney problems, have some degree of renal problems (20).

Immunopathology

Increased levels of tumor necrosis factor (TNF), interferon gamma-induced protein 10 (IP 10), interleukin 2 (IL 2), interleukin6 (IL 6), interleukin 7 (IL 7), granulocyte-macrophage

colony-stimulating factor (GM CSF), monocyte chemo attractant protein 1 (MCP1), macrophage inflammatory protein 1 alpha (MIP 1 alpha), and IL 2 in (CRS) (13). Moreover, C-reactive protein (CRP), lactate dehydrogenase (LDH), D-dimer, and ferritin levels were greater in the blood of those with corona virus and acute respiratory distress syndrome (ARDS). Inflammatory lymphocytic and monocytic migration into both respiratory and cardiovascular systems is made possible by the dilatation brought on by systemic inflammation. Pathogenic GM-CSF-secreting T cells have been associated with the migration of immune-mediated IL-6-secreting monocytes in COVID-19 patients, and substantial lymphocytic infiltrates have also been found at autopsy of the patients (21).

Aim of the study: The goal of the study is to learn more about COVID19's pathogenesis, symptoms, severity, and prognosis among Iraqi physicians.

Subject and method:

From the 17th of December 2020 to the 19th of March 2021, a cross-sectional research was performed in Iraq. Only physicians were present for the experiment, which was conducted on 103 people.

To eliminate any bias in the questionnaire, the link to the questionnaire was provided through different social media groups dedicated to physicians only.

Percentages were used to indicate all data handling and analysis.

Result:

Table1: Symptoms, their kinds, and their severity

	Mild	Moderate	Sever	Different from patient to other	
Respiratory symptom	6(20%)	5(17%)	4(15%)	14(48%)	29
General symptom	14(22%)	14(22%)	1(1%)	36(55%)	65
GIT symptom		3(44%)	2(28%)	2(28%)	7
Nervous symptom	1(50%)		1(50%)		2
Total	21	21	8	53	103

Physicians' thoughts regarding symptoms were diverse from patient to patient (36) 55 % for respiratory symptoms 29 of the total 103 samples, and most of the symptoms were different from subject to subject (14) 48 % for general symptoms (65person). Furthermore, the majority of the severity of the GIT symptoms (7), (3) 44% of them were severe, but the nervous symptoms (2) were thought to be of light severity by the physicians.

Table 2: The oxygen level during dyspnea

	O2 more 95%	O2(95%-90%)	O2 Less 90%	Total
Dyspnea	21(27%)	26(33%)	32(40%)	79
No dyspnea	4(17%)	9(38%)	11(45%)	24
Total	25	35	43	103

The physicians reported that the patients with covid-19 who had dyspnea were (79), that the majority of them had O2 levels less than 90%, (32) 40%, that the patients who did not have dyspnea were (24), and that the majority of them had O2 levels less than 90% (11) 45 percent.
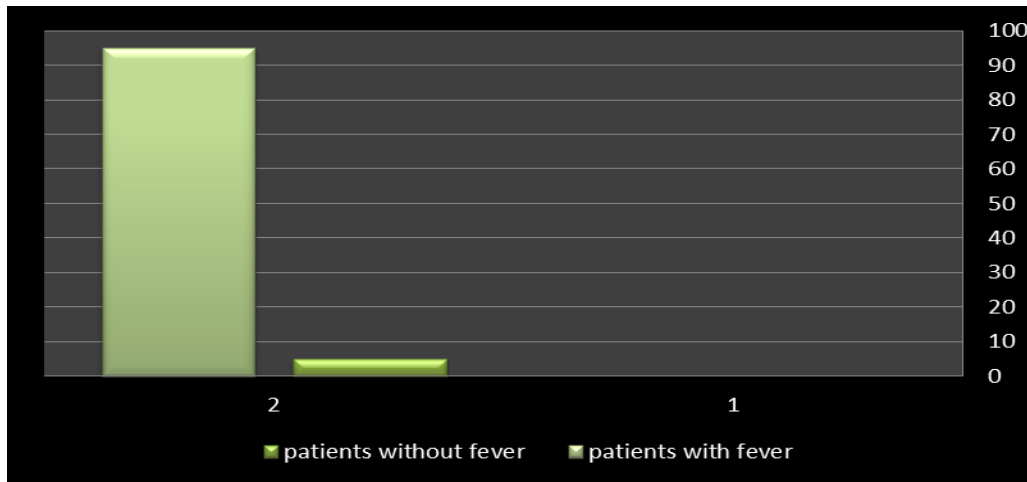
Figure 1: The percentage of patients who undergo fever

The large number of participants with fever (95%) and the relatively low percentage of subjects without fever (5%), are explained in Figure 1.
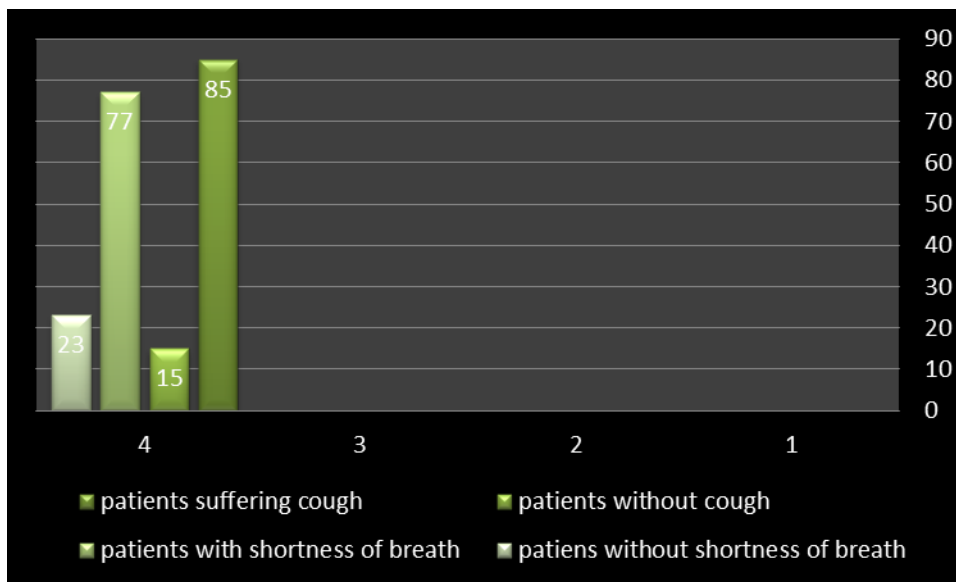

Figure 2: percentage of cough and dyspnea

Figure 2 depicts two groups, the first of which explains the large number of patients with cough (85%) and the low percentage of patients without cough (15%).

The second group depicts shortness of breath, which explains the significant number of patients who experience shortness of breath (77%) and the remainder (23%), who do not experience shortness of breath.
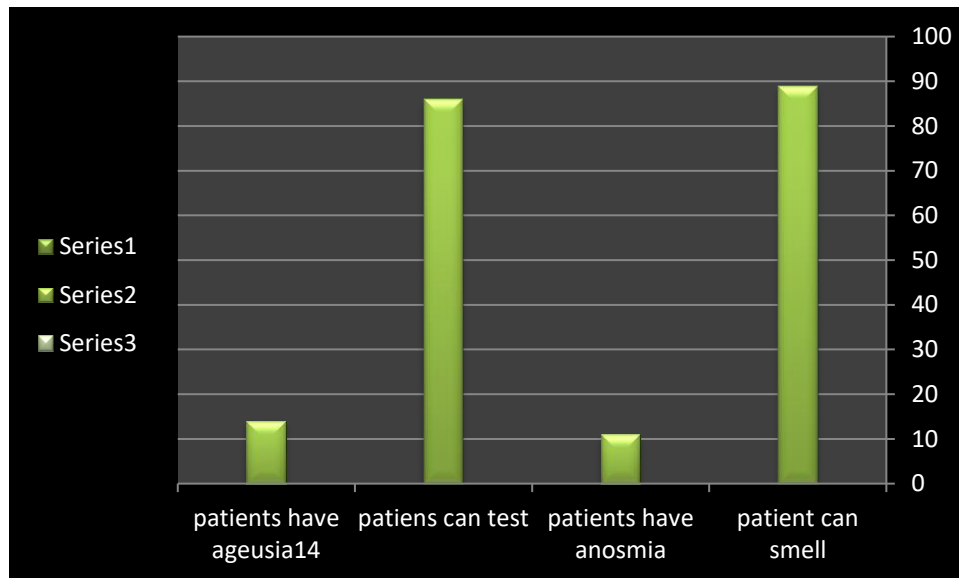
Legend:
- Series1
- Series2
- Series3

X-axis categories: patients have ageusia14 | patiens can test | patients have anosmia | patient can smell

Figure 3: percentage of anosmia and ageusia

Figure 3 demonstrates that the first category has a significant number of patients who can smell (89%) whereas Anosmia affects just 11% of the population.

The second group explains that the majority of the physicians can taste (86%) and who acquire Ageusia (14%).

Discussion:

The findings of this study demonstrate modest percentages of varying severity of symptoms, with respiratory symptoms being 20% light, 17% moderate, and 15% severe, which is consistent with a study conducted in India (22).

In terms of general symptoms, the results suggest that severe symptoms account for a small percentage of the total, while respiratory problems account for a larger percentage. The results of a Chinese study show that 14% of people have mild, 14% have moderate, and 1% have severe symptoms (18).

In terms of dyspnea, the results suggest that (40%) of physicians experience shortness of breath (oxygen saturation less than 90%). Reports from China show that a significant majority of patients (81%) experienced mild side effects from COVID-19 (no pneumonia or mild pneumonia). 14 % of individuals with more severe side effects (dyspnea, respiratory rate less than 30 minutes, blood oxygen immersion less than 93%) had significant indications (23).

According to the findings of the current study, the most prevalent symptom was fever, which accounted for the largest proportion (95%) of all illness symptoms (another study found that 88 % of patients have fever) (24).

Coronavirus infection's most prevalent manifestations included a persistent cough and breathing difficulties, with 85 % of the study population suffering from dry cough and approximately 77 % developing shortness of breath.

Similarly, According to one research, fever (affecting up to 90% of patients), a chronic cough (affecting 60% to 86%), and breathing difficulties (affecting 53 to 80% of patients) are the three most typical problems among hospital admissions, implying that the findings of both studies are comparable (25).

The latest research's findings demonstrate signs of anosmia and ageusia, with 11% of the population suffering from anosmia and 14 % developing ageusia. These results are lower than those found in another study (25).

Conclusion:

Considering that the COVID-19 pathogen has attacked people all over the world, the symptoms remain the same and the percentages vary from one population to the next due to a variety of factors, including the nature of the population, lifestyle, the severity of virus spread, medical services, and so on.

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