

Study Effects of Covid_19 Transmission And The Characteristics On Fertility

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ABSTRACT

Keywords

Coronavirus, Infertile patient transmission, respiratory syndrome

The SARS-CoV-2 virus, which is the causative agent of the recent pandemic known as COVID-19, includes information about its characteristics, origin, transmission, clinical symptoms, diagnosis protocol, transmission, potential treatment protocol, and available vaccinations that are currently in effect between patients visiting fertility centers. From asymptomatic to mild, moderate, and very severe cases, COVID-19 encompasses a range of clinical manifestations, and many things remain unclear to this day. Each of these cases has a unique immunology, which gets more complicated when the infertile patient develops a serious illness. Monitoring lymphopenia is crucial since it is a major mechanism in the etiology, a biomarker of the progression of severity, and a target for treatment. High viral loads at the time of the initial infection and recurrent viral exposure, particularly in infertile patients and healthcare professionals, can significantly increase the severity of the infection and should be rigorously avoided.

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1. Introduction

It was discovered that SARS-CoV-2 is a coronavirus [1]. The WHO identified the virus responsible for a series of unexplained pneumonia cases reported in Wuhan, China, as (2019-nCoV). The WHO officially designated the virus brought on by 2019-nCoV as COVID-19 on February 11, 2020 [2]. COVID-19 spreads from individual to individual [3]. The COVID-19 causative agent, SARS-CoV-2, is regarded as a member of the Coronavirus family, specifically the genus Coronavirus. When observed under electron microscopy (EM), the membrane-enveloped virus SARS-CoV-2 has a distinctive "corona" shape due to the peplomer-forming spike (S) glycoprotein on its surface [4]. Over 10% of the open reading frame mutations discovered between December 2019 and April 2020 were found to occur in the Spike glycoprotein gene alone, demonstrating how diverse and adaptable the virus's structural elements are [5]. The highly mutative nature of the viral coat therefore poses a problem for producing effective long-term neutralizing antibodies through administration of vaccines, leading to viral strains such as B.1.351 that escape from the immune response [6]. However, the structural proteins of the virus actually only constitute a small part of the coding capacity of the viral genome, with only 4 out of 29 proteins encoding viral structural components comprise the first two-thirds of the genome. The encoded polyproteins are autoproteolytically cleaved into 16 distinct non-structural proteins (nsp), generating the enzymes and accessory proteins responsible for viral replication once inside a eukaryotic cell [7]. These protein complexes produce and cap RNA strands that will go on to be translated by the host machinery. Capping the RNA in a manner that is recognized as similar to endogenous mRNA ensures compatibility, lessens RNA degradation rates and lowers the probability of triggering an immune response in the host cell. Following synthesis of the viral RNA strand, nsp13 is involved in preparing the strand for capping by removing the terminal phosphate group, after which nsp12 transfers the cap structure to the 5' end of the RNA. Nsp14, nsp16, and nsp10 then finalize the cap structure by adding several methyl groups, forming Cap1. Studies to inhibit this process is very promising and can even lead to develop a new antiviral specified for COVID-19 in infertile patient. [8] The tantalizing surge in the number of cases in fertile infected with SARS-CoV-2 in China, despite the closure of markets and evacuation of the vicinity, fulfilled the burden of proof that the virus can also be transmitted from human to human. Soon thereafter, peculiar cases of acute respiratory syndrome started appearing in other Asian countries, ultimately spreading to North America and Europe. [8, 11, 6], Following an emergent briefing on January 30,



2020, The World Health Organization (WHO) declared the outbreak of COVID-19 as a Public Health Emergency of International Concern[12]. SARS-CoV-2 and like many other RNA viruses showed a number of strains or what is known to be variants these are :Alpha variant. Beta variant ,Gamma variant ,Delta variant .There are also a number of variants of interest such as Eta , Lota , Kappa, Lambda . [17] OriginThe WHO report claimed that the SARS-CoV-2 could be detected in the environmental samples collected from the seafood market, but it has not yet been determined if a specific animal species carries the SARS-CoV-2[13, 14] A Research showed that SARS-CoV-2 was only closely related to the coronavirus isolated from Chinese chrysanthemum-headed bats in 2015, supporting the theory that the transmission chain started from bats to humans.[15,16] . .The virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols [18]. At first, the sensitive human cells show specific receptors for the viral Spike protein as the virus tend to interact with . When the virus enters the cell, the genome which consisted of RNA begins reproducing itself, and communicating particular arrangements that comes about in generation of valuable extra proteins; encouraging the adaptation process of CoV to its human host[19] Therefore, the classification of CoVs is continuously being changed. Based on the most recent classification provided by The International Committee on Taxonomy of Viruses, there are four genera of CoVs, that comprise a total of 38 unique species [20]. Following a cascade of signals after binding, the viral genome is successfully injected into the target cell. The genomic RNA that regulates the expression of structural and nonstructural polyproteins, is polyadenylated and encapsulated. These proteins are then cleaved by certain proteases that exhibit chymotrypsin-like activity [21, 19], Through replication and transcription, the resulting protein complex drives the production of negative-sense RNA or (-) RNA. Full-length (-)RNAs produced by replication are ultimately used as templates for generation of positive-sense RNA or (+) RNA X [22] [19] The CoVs released thereafter are now capable to infect a wide spectrum of human cells, including lung, renal, hepatic, intestinal, and lower respiratory tract cells, as well as T lymphocytes[23,21].

SARS-CoV-2 tends to infect the respiratory tract, thus, pneumonia is a primary clinical finding in infertilepatient with COVID-19 [24].The resulting SARS may then be aggravated and lead to serious conditions that are extremely difficult to control, for example, septic shock, metabolic acidosis, and coagulation dysfunction [25].Investigation on the radiological findings of COVID-19-associated pneumonia have yielded little, if any, information that are mostly unspecific.



Progressive lung lesions are usually detected in infertilepatient with COVID-19, about 1 week after the onset of signs and symptoms [26,27,28]. Long-term complications of COVID-19 in infertilepatient with severe pneumonia might include an array of fibrotic changes often observed in the late stages of lung injury, for example, reticulation, interlobular septal thickening, and traction bronchiectasis [29]. There have been several reports that indicated meager Cytolethal Distending Toxin-induced lymphocytes, with a density as low as 200 cells/mm³ in three infertilepatient with SARS-CoV infection[30][31]. As in the case of SARS-CoV-2, it has been suspected that infection with this type of CoV might lead to inflammatory cytokine storm [32][33] a life-threatening condition characterized by elevated levels of interleukin 6 (IL-6) in plasma. A number of investigations recently conducted on COVID-19 have reported that IL-6 levels was actually higher in the infertilepatient with severe disease [34] This could highlight the importance of IL-6 as a biomarker for evaluation of disease severity [35]. A recent study has concluded that liver function abnormality might stem from infection of bile duct cells with SARS-CoV-2. Nonetheless, the alkaline phosphatase value, which is an index of bile duct damage, were not specific in infertilepatient with COVID-19 [36]. Scientists have reported moderate microvascular steatosis, and mild lobular and portal activity in these infertilepatient , that suggests liver damage may have arisen from either SARS-CoV-2 infection or drug-induced liver [37]. Myocardial, gastrointestinal, and renal symptoms: homeostasis of electrolytesAn essential player in maintenance of electrolyte balance and blood pressure, ACE2 is regarded by many as the principal counter-regulatory arm in the axis of renin–angiotensin-aldosterone system [38]. The final effect of ACE2 in an otherwise healthy adult is to increase reabsorption of sodium and the reciprocal excretion of potassium ions (K⁺). The concomitant re-uptake of water with sodium reabsorption prompts an increase in blood pressure [39] Potassium is the predominant intracellular ion, that is majorly involved in regulation of cell membrane polarity. A hyper-polarized cell membrane tends to be depolarized faster than normal, causing aberrancy in the function of cardiac cells [40] In a recent cohort study, infertile patient diagnosed with COVID-19 were categorized into three groups: severe hypokalemia, hypokalemia, and normokalemia. The study reported that 93% of infertilepatient with a severe clinical condition had hypokalemia. Scientists did not find a direct link between gastrointestinal symptoms and hypokalemia among 108 infertilepatient with both severe or moderate hypokalemia [41,42].



2. Experimental procedure

Data and the statistics in this research project were obtained from about 99 infertile patient who participated in a questionnaire submitted as an online Google Form containing questions within different aspects such as demographic questions about the included (gender, age, education, severity of illness), the potential sources of infection, the medical history of the and the clinical symptoms experienced by the initial screening, computed tomography (CT) examination is needed for the auxiliary diagnosis [43]. The diagnosis is then confirmed by the positive results of the nucleic acid amplification test (NAAT) of the respiratory tract or blood specimens using polymerase chain reaction (PCR).[44,45,46]. An academican of the American Society for Radiation Oncology called for the immediate establishment of a CT-based diagnostic method for COVID-19 and improvement of the detection rate of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[47].

3. Results and discussion

3.1 Effect of gender on COVID_19

The results in Fig.1 show increase ($P < 0.05$) in female when compared with male, the numbers of female that infected with COVID-19 are larger than that of male.

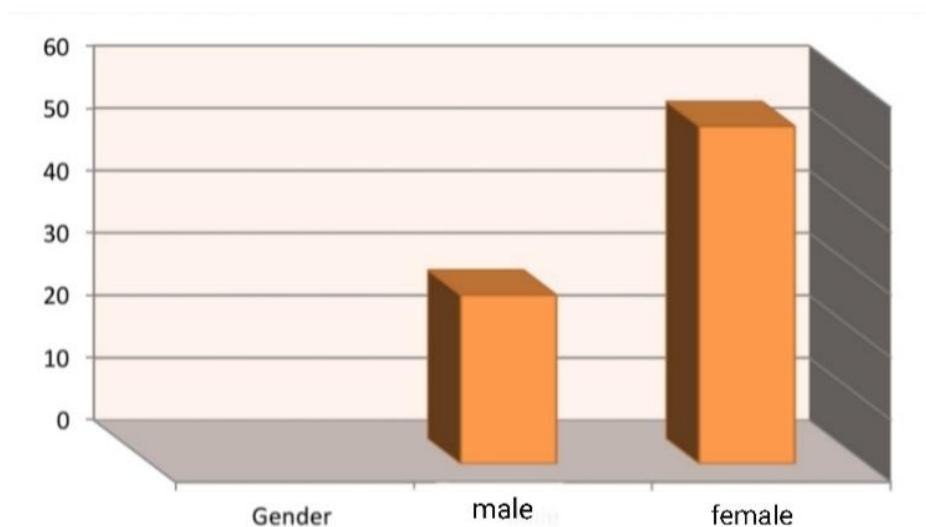


Figure 1: Effect of gender on COVID_19

Figure 2 shows increase ($P < 0.05$) in age group (23-24 years) when compared with age group (15-16), also the results show increase ($P < 0.05$) in age group (22 and 30-39 years) when compared with (50-65) years. Effect of corona virus on severity of infection: The results in figure(3) show increase ($P < 0.05$) in all case of infection that represent (medium infection with take medication but no need to enter to hospital when compared with acute state (that need to treatment and enter to hospital). also the results in figure (3) show increase ($P < 0.05$) in simple state (no need for treatment and hospital) when compared with acute.

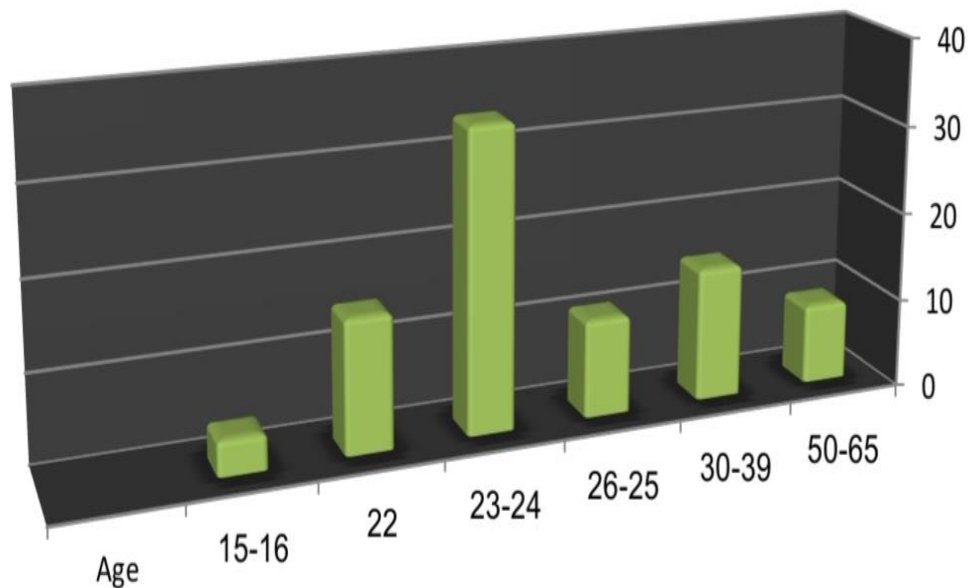


Figure 2: Effect of corona virus on age

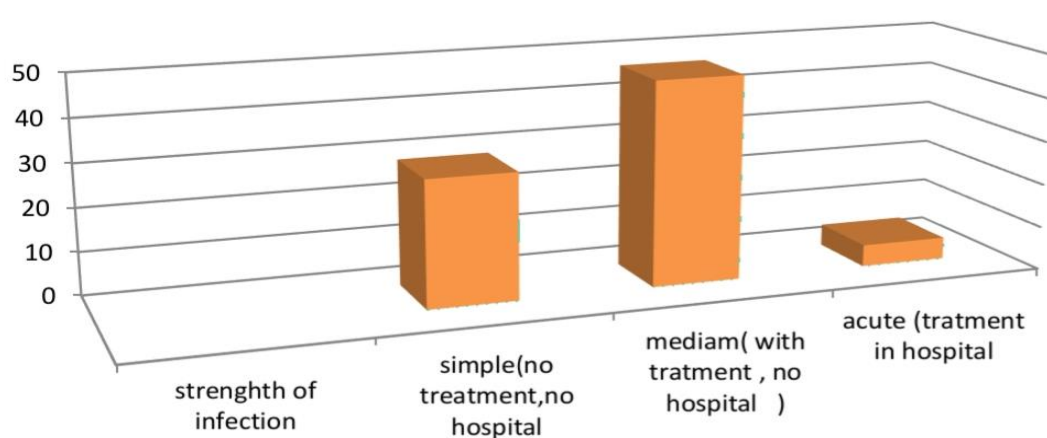


Figure 3: Effect of corona virus on severity of infection

Figure 4 shows change ($P < 0.05$) in infertile patient that not taking alcohol from non drinking , also showed significant increase ($P < 0.05$) in infertile patient that non smoking and non suffering from disease before infection with corona virus from infertile patient smoking and suffering disease before infection with virus. Figure 5 shows change ($P < 0.05$) in timing for symptom onset in infertile patient where gradual onset was more than sudden onset. also the results showed increase ($P < 0.05$) in source of infection that comes from touching or direct contact with infertile patient infected with SARS-CoV-2 when compared with other ways of transmission of the infection including (saliva, unknown and touching surface) that showed significant decrease.

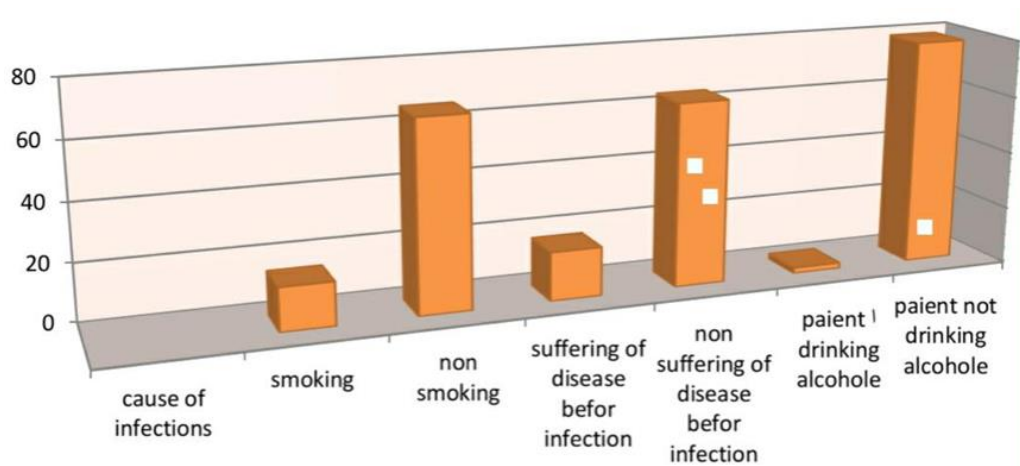


Figure 4: EFFECT OF OTHER DISEASES AND HABITS ON CORONA VIRUS INFECTION

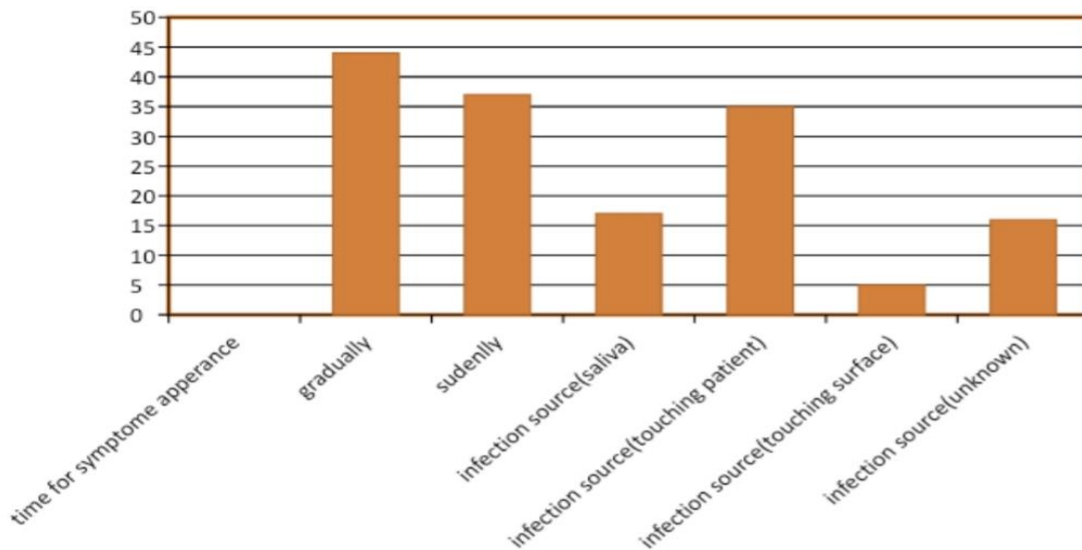


Figure 5: The timing for symptom appearance and the source of infection with COVID-19

In Fig..6, the results show increase ($P<0.05$) in infertile patient at university when compared with other that areat (preparatory , intermediate and primary school) which showed decrease. Figure 7 shows increase ($P<0.05$) in infertile patient with high fever and with headache when compared with infertile patient with no fever and headache , also the results showed significant without diarrhea , with coughing and no difficulty breathing when compared with anther groups.

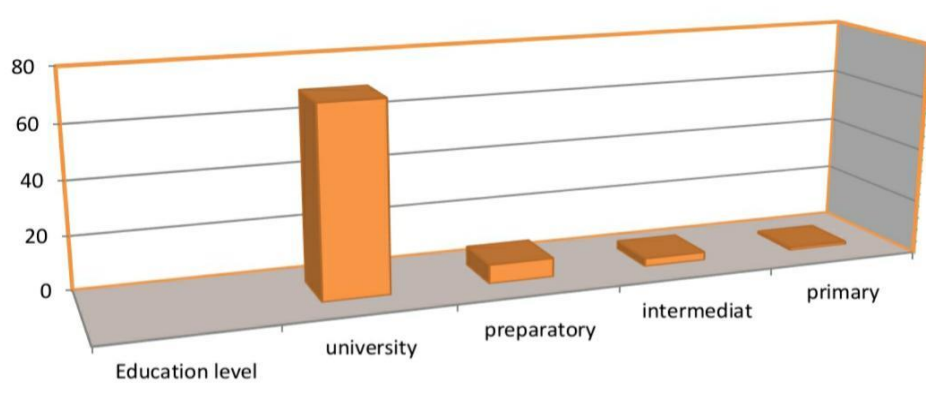


Figure 6: The relationship between the educational level and COVID_19

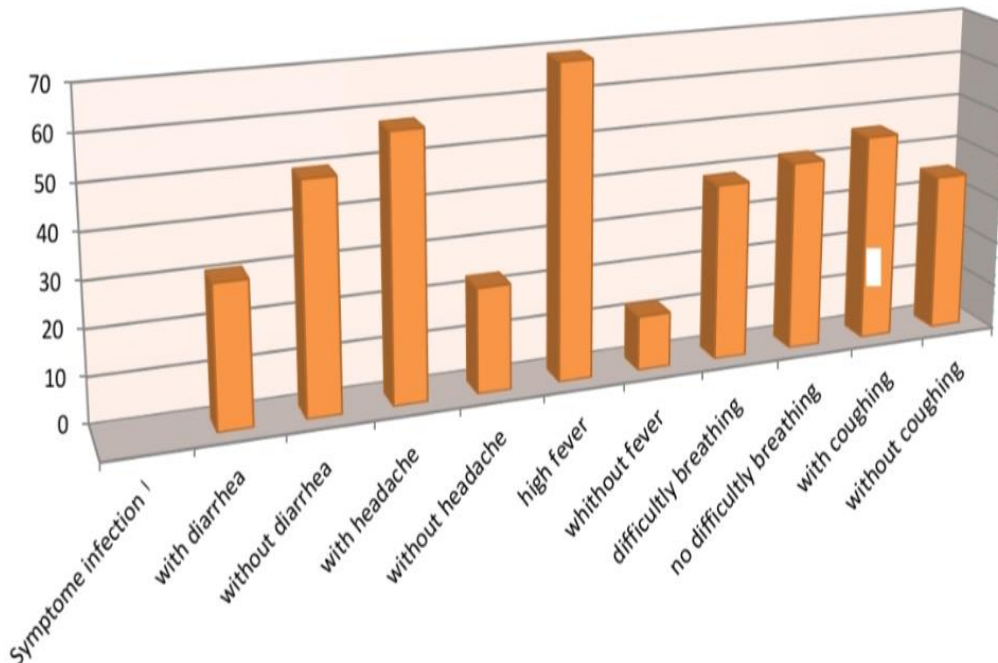


Figure 7: The variety of symptoms associated with COVID-19 infection

4. Discussion

COVID_19 is the cause behind the most recent pandemic that humanity has faced , a virulent virus that we know very limited information about it has infected 201 million person and caused 4.26 million deaths worldwide [49] .The result showed a relationship between age and susceptibility for infection for male and female infertile visit center , where the highest infection rates recorded ($P < 0.05$) were at young adults specially at early twenties 23_24 followed by thirties and less frequenting at the teenage and elderly people. The results also showed the effect of gender on susceptibility for infection where women compared to men had recorded more infections that's maybe due to social differences that make men more busy or maybe women are more interested in participating in an online surveys and questionnaires. the same regarding the gender while the opposite regarding the age and that can be due to the population involved in this research project specially that its data was collected through an online survey and it is known that less elderly people are using the social media compared to younger people [50] : Evidence from 177 countries and territories-an exploratory, ecological study” that the age-dependent correlation between people over 65 years of age with incidence rate as higher in females, while the correlation between age distribution and case fatality rate as well as multiple comparisons was higher in males ($p < 0.0001$ for all). Besides, we found the age-gender-dependent differences were correlated to incidence rate in places with high income and associated with case fatality rate in non-high income countries/territories. **This means that** the correlation between the composition of age and gender and the epidemic characteristics of COVID-19 confirmed previous points that females are more susceptible to COVID-19. While the results they found focused on that attention should be paid to male infertile patient , particularly those over 65 years old for enhanced clinical management. The result referred to a fact that most cases were mild in severity ($P < 0.05$) and did not require hospital care or specific treatment elsewhere they were self limiting and probably that has a relationship with the fact that majority of the infected infertile patient was of young ages with very low number of them having other diseases or smokers , the same thing was declared by the world health organization regarding the severity of infection and its relationship between the age , smoking and presence of other diseases where it stated that the most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness also in another article in May 27, 2020 WHO; clarified that available



research suggests that smokers are at higher risk of developing severe COVID-19 outcomes and death. On other hand we have the onset of the symptoms where it was at the very most of the infertile patient gradual onset and this agrees with other researches which considered this fact as a feature to distinguish COVID_19 infection from other respiratory infections such as flu example of this the article written by JillSeladi-Schulman, PhD. On December 26, 2020. “Signs and symptoms of the new corona virus and COVID_19” where explained the characteristic onset of COVID_19 as a way to differentiate between it and flu where stated that the symptoms of the flu often come on suddenly, while COVID-19 symptoms appear to develop more gradually. The source of infection varies among infertile patient but the most frequent source of infection was direct contact with infected people and in the second grade comes the air droplets from the infected people that confirm that COVID_19 transmitted from one person to another and is not airborne transmitted so precautions and safety measures specially when handling with others can limit and even prevent the transmission of infection to a high degree this results comes alongside the recommendations of the WHO (Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations, on inflected 2020) which also confirmed that transmission of the COVID-19 virus can occur by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person (e.g., stethoscope or thermometer). The educational level has showed that most of the infected people were at university and probably that explains why the age groups who were the most infected were at early twenties which is the age of most high education students that can be related to many reasons to explain this result which is totally agree with the results of the researches done [51] ,where researchers found that the pandemic has exerted a greater impact than on college students than on elementary and middle school students. Basically college students come from different regions , they are a group with huge cross-regional mobility. On campus, college students have more freedom in their studies and lifestyle. They don’t have a fixed place to study, and the optional nature of courses make many classrooms a temporary combination of different students. Furthermore, students have more time to go out after class and participate in activities in the city or other public places. These factors not only make them more susceptible to infection, but also make them a vector for virus transmission. Add to that the fact that most college student actually work in a part time jobs to provide their financial needs for their study and therefore have a less opportunity to quarantine themselves in home.



The results regarding the most frequent symptoms of COVID_19 infection showed that most cases had high fever, cough, difficulty to breath and diarrhea. Only a few cases didn't have fever or headache while a lot didn't have diarrhea and difficulty breathing that tells us the most common symptoms are high fever and headache which agrees with what WHO has declared where it stated that the most common symptoms of COVID_19 are headache, fever and tiredness and less common are diarrhea, sore throat, aches , loss of taste and smell while considered the difficulty in breathing as a serious symptom that need to be managed by healthcare professionals.

Conclusions

In conclusion, SARS-CoV-2 and its contagious illness COVID-19 are linked to considerable morbidity and mortality worldwide, likely ranking among the greatest health and financial burdens of the previous century. COVID-19 turned into one of the biggest human struggles of the contemporary era, highlighting the necessity of international cooperation and a worldwide strategy. Because of the long infectious incubation period before symptoms appear, asymptomatic virus carriers, super spreaders, and the extent of globalization with individual traveling, SARS-CoV-2 showed an unexpectedly high speed of transmission and global spreadability. It also had an impact on male and female fertility age, severity, and symptom. Owing to the nature of the illness, it is challenging to contain COVID-19 spreaders, which include domestic animals that carry the virus, recently afflicted infertile patients who are still in the incubation stage, and asymptomatic virus carriers. Future research aims to prevent severe disease by better understanding the etiology of ARDS, cytokine storm, and lymphopenia, as well as by developing innovative methods to stop their development. The knowledge gained during the SARS and MERS outbreaks is tremendously significant. T- and B-cell cross-reactivities make the vaccinations and medications created at that time potentially beneficial. Antiviral treatments to increase immunity and the use of biologics to slow down or stop the cytokine storm are two significant immune therapies that are anticipated in the next months. The global use of potent vaccinations and chemical antiviral treatments will aid in the disease's control. An essential supplementary technique for diagnosis and a deeper comprehension of population immunity is specific antibody detection. There is still a need for a universally recognized antibody detection technique. Preparing for the potential emergence of the next zoonotic illness in the future will also require an understanding of the broad response of the innate and adaptive immune systems to SARS-CoV-2.



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دراسة تأثير انتقال كوفيد 19 وصفاته على الخصوبة

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المستخلص

يعد العامل المسبب لمرض كوفيد 19 هو السارس SARS-COV-2 وتتمركز خصائصه ومنشأه وانتقاله والاعراض السريرييه وبروتوكول التشخيص والانتقال وبروتوكول العلاج واللقاحات المتوفرة بين المرضى الذين يعانون من العقم اختلافا وتأثيرا مهما في زياده المراجعين للمركز الصحي للخصوبه للتأكد من تأثيره على خصوبة الرجل والمرأه. تمثل هذا المرض (كوفيد 19) اشكالا سريرييه متعدد تبا من الحالات غير المصحوبة بأعراض الى حالات اخف او متوسطه او شديده جدا , ولايزال هناك العديد من الفحوصات جارية الكشف على المرضى . تتمثل بأختلاف مناعه المريض حيث يصبح المرض اكثر تعقيدا عند وجود العقم اذا كانت الاصابه شديده بالكوفيد , ولوحظ ان زياده العمر وشده الاصابه ونوع العلاج المستخدم نوع الجنس ونوع العقم له تأثير على الحاله الصحيه للمصاب تكمن في زياده الفحوصات للحاله ومراقبته . وتمثل الاليه الرئيسييه في التسبب في المرض والعلامات المرضيه المشيره الى تطور شدته والهدف من العلاج ونوعه . ويمكن ان يكون المريض الحامل للاصابه او المصاب ثم تعرض لاصابه ثانية متكررة خاصه بين مرضى العقم , عاملا مهما في تحديد شده الاصابه لتجنب تفاقم الحاله السريرييه وتحديد العلاج الملائم

