LEADING ARTICLE

Coronavirus-2019 (COVID-19): A Novel Pandemic Disease with Global Health Care Burden

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DOI: https://doi.org/10.32441/aajms.3.3.1

Coronavirus is an ancient virus with a worldwide distribution [1]. This virus group is the second common cause of common cold after Rhinoviruses [2]. Both human and animals are infected by Coronaviruses and induced mild respiratory infections with rare case severity. Bats, cats and camels are the reservoirs of coronaviruses and the viruses may be transmitted from animals to human and thus included in zoonotic infectious diseases. During the period from the 1st human coronavirus isolation, the virus without medical interest as they mostly induced mild upper respiratory infections [3]. Coronaviruses are present for at least 500-800 years in human and all originated in bats [4,5]. Additionally, this virus group is responsible for infections induction in mammals and birds [6]. In medical history, only 3 global pandemics were reported, plague pandemic in 1720, Cholera pandemic in 1820, and Spanish influenza pandemic in 1920 [7]. However, the COVID-19 pandemic differs from the previous 3 pandemics in its transmission in an exponential manner (Exponential equation). COVID-19 caused by SARS-CoV-2 which was naturally evolutes in animal and transmitted to human [7].

Before the outbreak of COVID-19, only six coronaviruses reported that are with the ability to infect human: MERS-CoV, SARS-CoV, HCoV-HKU1, HCV-229E, HCoVNL63, HCoV-OC43 [8-10].

The last four are endemic locally and associated mainly with the mild, self-limiting disease, while the first two can cause severe illness [11-13].Genetic diversity of Coronaviruses, genome frequent recombination, high prevalence rate, unavailability of an effective vaccine and antiviral agents, and high prevalence rate and animal-human interface increasing activity form a continuous threat to human health [14,15]. The health threat became obvious in December 2019 and early 2020 as the novel coronavirus (SARS-CoV-2) was identified as the aetiology of rabidly and large outbreaks of respiratory disease, including potentially fatal pneumonia, in Wuhan, China [16]. In a short period the COVID-19 transmitted from China to about all worlds.

COVID-19 mortality was lower than that of Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) [17,18]. Both SARS and MERS were spread between people with close contact. MERS outbreak still occurring and spread outside the Middle East region such as South Korea [19].

The respiratory viral diseases are the common viral infections that are spread frequently among people through droplets of coughing, sneezing and maybe talking [2]. In the last two decades, three coronavirus strains that induced respiratory diseases outbreaks [20]. SARS-CoV-2 was different from SARS-CoV and MERS-CoV as it leads to pandemics, while the other two were epidemic .

The sequence databases indicated that all human coronaviruses were of animal origin [21,22]. Previous studies documented the spillover of coronaviruses from animal to animal and from animal to human [23-58]. The natural course of the disease indicated that immune and inflammatory responses form the effective arm that controls the outcome of the infection. However, the disease severity and mortality may be a side effect to both immune and inflammatory responses [2]. In literature, the virus-host interaction was studied and multiple scenarios were proposed for the effectiveness of immune responses in disease control and outcome and immunity-inflammatory influence on disease mortality [59-137].

Although there are a global research works that evaluate the effectiveness of drugs/compound as a therapeutic approach for COVID-19, however, to date none found to be with promising effect. The Russian researcher formulated an effective antiviral agent

(Favipiravir] against SARS-CoV-2 and introduced to the market for their use. Additionally, the vaccine evaluation takes a long period until the development of the novel potential vaccine. The research efforts to find effective antiviral agents panel and effective vaccines take a long time to introduce promising results. The best approach to find an effective drug against SARS-CoV-2 infection is to test new compounds, not to rely on the testing of that used in another virus's treatment. The novel drugs are that which prevent viral attachment with the host cell to get rid of immune and inflammatory harmful responses [138].

COVID-19 is the first disease that takes the attention of WHO; national, regional and global health authorities; all worldwide political directors; non-governmental organization; human rights organization, and social leaders. The COVID-19 pandemic illustrated the following outcomes:

1. Globally there is no perfect health care system that deals effectively with COVID-19 pandemic in both developed and developing countries.
2. To date, the only antiviral agent that assumed to be effective in the treatment of COVID-19 is Avifavir (Favipiravir) and may be Remdesivir.
3. The main common methods of disease transmission are through droplets of coughing, sneezing or maybe talking.
4. The most effective preventive measures are social distancing, mask-wearing, personal hygiene (frequent hand washing), wandering prevention, quarantine of contact and isolation of the infected individual.
5. Area isolation is essential for disease control.
6. Social and personal compliance with orders of wandering prevention, social distancing, personal hygiene and none attendance to crowded places for the risk factors that leads to the exponential increase in COVID-19 cases.
7. Forman et al [139] addressed key lessons which include: Transparency, solidarity, coordination, decisiveness, clarity, accountability, refocusing and increased funding to ensure the WHO is capable of coordinating global responses to major health challenges, Existing global insurance institutions and policies are inadequate, and these require significant changes and improvements, Efforts to develop COVID-19 vaccines and

treatments are commendable, but there is still much more to do, We need to test the responsiveness and resilience of health systems and make changes and improvements based on the results, Effective communication must occur at the highest political levels, and There are opportunities to introduce novel approaches, such as using robots and artificial intelligence (AI), in this – and in future – pandemic response .

8. Attention for human rights and health education are needed globally.
9. We noticed the spread of SARS-CoV-2 to individuals working in the hospital management department, operation theatre, X-ray section, and the wards that are away from those dealing in the management of COVID-19 patients. This suggests that mechanical ventilation and air conditioning system may play a role in virus transmission. Thus this must be taken into consideration at the time of hospital building design or to go back to our previous infectious disease hospitals.
10. The infrastructure of the ministry of health needs urgent SWOT evaluation and actions must be taken to improve the health care system and MOH budget reform.
11. The disease pandemic not led efficiently as there is misconduct and conflict or opposition between the political leaders and healthcare leader's actions. In the current situation, the leadership must be operated by healthcare personnel.
12. The pandemics uncontrolled and characterized by a steady increase in cases with time due to political orders not to close border as early as possible. i. e. the disease focus is from Iran.
13. A contradictory opinion released from WHO.
14. The government did not cover the needs of the self-employed workers and thus they forced not to comply with orders of wandering movement with subsequent exposure to disease focuses.
15. Lack of infection control measures in MOH hospitals and primary care centers.
16. Lack of health care personnel training on the control of infections.
17. No role for an epidemiologist, virologist and immunologist in the control and preventive measures.

18. The pandemic clarifies the importance of medical colleges, Health technical colleges and laboratory technical college's curriculum reform.
19. The cases mainly managed by a physician specialized in internal medicine, which is not the sound approach. Thus sub-specialty post-graduate establishment in Iraqi Board of Medical Specialization and Arab Board of Medical Specialization or medical colleges is required urgently .
20. MOH financial support from the central government is not enough to provide 15% of health care services.
21. There is no global agreement on the origin of the virus. Is the virus mutated naturally in its animal host or is it a human-induced strain? No dogmatic answer yet, the future will explore that fact.
22. Herd immunity approach would not solve the COVID-19 problem.
23. MOH not provided enough personal protective equipment for all health care workers.
24. There are non-ethical research working as reported by retraction of two large scale research works by Lancet and New England Journal.
25. To date, the most effective treatment as antiviral agent is the use of plasma from previously infected individuals. However, the reduction if IgG and neutralizing antibody levels in the early convalescent phase might have implications for immunity strategy and serological survey [140].
26. Vaccine production trials may be promising.
27. There is a wide gap between expected incidence and MOH daily cases reporting and this mostly due to low screening coverage [1.33% of total Iraqi population, 29/6/2020].
28. Although the Iraqi Health Care System is with many deficits, the health care providers working properly and influence pandemic outcomes.
29. Recent study [141] indicated a 3p21.31 gene cluster as genetic susceptibility locus in patients with COVID-19 with respiratory failure. Additionally, ABO blood group system also involved in the influence of individual susceptibility to COVID-19 infections. Blood group A was with higher risk, while group O was with lower risk for SARS-CoV-2 infection.

30. One social problem that challenges COVID-19 management in Iraqi community is the believe that the disease is STIGMA.
31. The disease mortality rate was 4.766% (28/7/2020) and the prevalence rate was 0.287% for Iraqi population (115332/40138387). The recovery rate was 70.3%.
32. The cases incidence increased dramatically during the period from 5/6/2020 to 28/7/2020 (54 days) as compared to the period of 98 days from 24/2/2020 to 4/6/2020. The cases at 28/7/2020 12 times (106492) that that at 4/6/2020 (8840). This cases incidence increase may indicate that COVID-19 may be out of control. The increase in COVID-19 incidence was mostly attributed to the personal behavior as they not apply the recommendation of WHO and national and local crises committees. Nosocomial infection especially in healthcare providers increased due to none availability of protection equipments and this may play another was for disease transmission. Disease stigma in community prevent many of infected individuals from healthcare consultation and thus play a focus of infection in their communities. Recently, the heresy of typhoid fever classification of moderate number of cases provide another focus for infection in the community.

In conclusion, SARS-CoV-2 pandemic infection indicated the needs for global health care systems reform. In addition, the pandemic illustrated the need for health education and establishment of infectious disease subspecialty in medical institutes and warranted building of infectious disease isolated hospitals with a special design that overcome nosocomial infections.

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