

Variation of clinical features in COVID-19: A narrative review

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ABSTRACT

Introduction: COVID-19 is global pandemic condition caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) which started in December in China, affecting 216 countries till date. Lack of experience and diverse clinical features of this virus is alarming to scientists and health personals.

Method: Systemic review search conducted using pub med, google scholar, WHO and CDC. Search was done using terms Coronavirus, clinical features, 2019-nCoV, SARS-CoV-2, SARS-CoV, MERSCoV and COVID-19. COVID-19 or SARS-Cpv-2 related original English literature research, review articles, case reports, meta-analysis and systemic review were included.

Result: Having higher infectivity of COVID-19 compared to previous epidemics of coronavirus, droplet transmission occurs both from symptomatic and asymptomatic patients. Aerosol transmission occurs in protracted exposure to elevated concentrations of virus. Besides fever, cough and SOB, GI symptoms like nausea, vomiting and diarrhoea were seen. Anosmia is evolving as new clinical feature. Increased thrombotic complications in critically ill patients were pronounced. Most cases were mild with low case fatality rate ranging from 2.3-7.2% among critical patients.

Conclusion: Despite recent advances and increasing studies, the global pandemic COVID-19 still remains major headache and challenging for governments across the world due to limited testing capacity, treatment and vaccine.

Keywords: clinical features, Coronavirus, COVID-19, 2019-nCov

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INTRODUCTION

The global pandemic of novel coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) began in Wuhan, China, in December 2019, and developed into a global pandemic within three months from its initial detection.¹ On 12 January 2020, the World Health Organization temporarily named the new virus as 2019 novel coronavirus (2019nCoV).^{1,2} Only three months after the outbreak, World Health Organization (WHO) officially declared COVID-19 as a pandemic on 11th March 2020.³ As of 16th September 2020, 29155581 confirmed cases and 926544 deaths has been reported in 216 countries since 31st Dec 2019.⁴ The experience from countries with higher number of cases such as China, Italy and Spain show that COVID-19 requires unprecedented mobilization on health systems.⁵ Looking at the clinical features; it has shown a variation. According to the World Health Organization (WHO) report, 2019-nCoV is a unique virus that causes respiratory disease, which spreads via oral and nasal droplets. In a phylogenetic analysis of 103 strains of SARS-CoV-2 from China, two different types of SARS-CoV-2 were identified, designate type L and type S.⁶ Moreover, the pathogen of COVID-19 can float in the air in the form of aerosols and cause infection in healthy people.⁷ SARS-CoV-2 can be transmitted even before symptoms appear and throughout the course of illness. Viral RNA levels from upper respiratory specimens appear to be higher soon after symptoms onset compared with later in the illness.⁸ There seems to be wide variation in duration of viral shedding based on disease severity.⁹ The median duration of viral RNA shedding from nasopharyngeal or oropharyngeal specimens ranged from 24 days to 42 days.¹⁰ So, the risk of transmission from an individual with SARS-CoV-2 infection varies by the type and duration of exposure, use of prevention measures and individual factors. Most secondary infections have been described among household contacts, in congregate or health care setting when personal protective equipment (PPE) was not used, long term care facilities and in closed settings.

METHOD

A systematic review search of available evidence was conducted in pub med in COVID-19 on COVID-19 and clinical features and its associated character world-wide. The Search terms included coronavirus, clinical features, 2019-nCoV, SARS-CoV-2, SARS-CoV, MERS-CoV and COVID-19. A grey literature search was performed using the same keywords on Google Scholar to capture the most recently published articles. The WHO and CDC database of publications on novel coronavirus was screened for potentially relevant publications. Additional articles were retrieved from the reference lists of the studies included in the study by screening the reference list. The studies regarding clinical features of COVID 19 or SARS-Cov-2 were included. The inclusion criteria applied were original research articles like review articles, case reports, meta-analysis and systematic review focused on above domains. Reports and articles from WHO and CDC (Centre for Disease Control and Prevention) were included. Articles focused on other viral pandemics with no mentioning or discussions of COVID-19 were excluded. Non English Literature and non-full text articles were excluded. Extraction of the data was done assessing quality of the study focusing on 2 domains i.e. infectivity and clinical features.

RESULT

Infectivity

The “basic reproduction number” termed R_0 is used which indicates the expected number of cases directly infected by one contagious case in a population that everyone is supposed to be susceptible. According to the article published in New England journal of medicine on March 26, 2020 by Qun Li the infectivity index for Wuhan Coronavirus i.e. COVID -19 was 2.2 (95% CI 1.4 to 3.9) while the index for SARS and MERS was approximately 2.0 which shows that the infectivity of new COVID-19 is higher than other previous epidemics of coronaviruses.¹¹

Table 1. Clinical features of COVID- 19 based on Leiwen Fu, et al.²³

Symptoms	Percentage	95 % confidence interval
Fever	83.3	78.4-87.7
Cough	60.3	54.2-66.3
Fatigue	38	29.8-46.5
Lab findings:		
Elevated CRP	68.6	58.2-78.2
Decreased lymphocyte count	57.4	44.8-69.5
Increased LDH	51.6	31.4-71.6

While other studies have reported different R_0 with the lowest being 1.95 (1.4-2.5) reported by WHO and highest being 6.47 (5.71-7.23) reported in journal of clinical medicine by Biao Tang.¹² The variations in the index were because the calculation was done in different time of disease epidemics

Transmission

The first case of COVID-19 disease was linked to direct exposure to the Huanan seafood and later human to human transmission was found from both symptomatic and asymptomatic individuals.²¹ Aerosol transmission is also possible in case of protracted exposure to elevated aerosol concentrations in closed spaces.²⁷ The spread in fact, is primarily limited to family members, healthcare professionals, and other close contacts within 6 feet or 1.8 meters. Concerning the duration of contamination on objects and surfaces, a study showed that SARS-CoV-2 can be found on plastic for up to 2-3 days, stainless steel for up to 2-3 days, cardboard for up to 1 day. Moreover, it seems that contamination is higher in intensive care units (ICUs) and medical professionals having more fatality because of transmission from sick patients than normal population.¹³

Virulence

The spectrum of disease ranges from mild to severe; and most of the infections are mild.¹⁴ While comparing with the previous epidemics of SARS in 2003 and MERS in 2012 the case fatality rate the case fatality rate of COVID 19 was lower i.e. 2% and only 15% of patient would seek hospital treatment. However, the case fatality rate of SARS and MERS was 10% and 34 % respectively.¹⁵ In a report from Chinese center for disease control and prevention that included approximately 44,415 confirmed cases 81% cases had mild disease (No or mild pneumonia), 14% cases had severe disease (SOB, Hypoxia and involving more than 50 % of lungs on imaging), 5% had critical disease (with respiratory failure, shock or multi organ failure) and overall Case fatality rate (CFR) was 2.3% with the deaths seen only among critical patients. But the case fatality rate in other parts of China is different e.g. in Beijing the CFR was 0.9%. 3.8% of health care personals were infected, majority of infection to health care personals occurred in Wuhan.¹⁶ The case fatality rate in china ranges from 5.8% in Wuhan to 0.7% in rest of the china.¹⁷ Patients with advanced age and underlying comorbidities were found to have more fatality rates.¹⁸ However, there is higher number of deaths in recent pandemic due to rapid

spread of the disease e.g. In Italy, there was case fatality of 7.2% till mid-March.¹⁹

Clinical features

Though Fever, cough and SOB are the most common features, GI symptoms has also found to be common in a study done by Xi Jin where he found 11.4 % of patients presented with at least one GI tract symptoms (nausea, vomiting, diarrhea).²⁰

A study published in JAMA among 5700 hospitalized COVID-19 patients in New York city for comorbidities with a result of most common comorbidities of hypertension in 56.6%, obesity in 41.7% and diabetes in 33.8%.²¹ The other meta-analysis done by Bo Li, et al. in 1527 patients found with presence of hypertension in 17.1%, cardio-cerebrovascular disease in 16.4% and diabetes in 9.7%. The study also shows that patients with previous cardiovascular metabolic diseases may face a greater risk of developing into the severe condition and the comorbidities can also greatly affect the prognosis of COVID-19.²²

In the meta-analysis study on Thrombocytopenia associated with severe coronavirus infections by Giuseppe Lippi, et al., where he studied 1779 COVID-19 cases from 9 studies with a finding of 22.4% severe disease. The pooled analysis revealed that platelet count was significantly lower in patients with severe disease (WMD- $31 \times 10^9/L$; 95% CI, from -35 to -29×10^9).²⁴ A new clinical feature, anosmia has been found in up to 47% of COVID-19 positive cases, in a study done by T. Klopfenstein, et al.²⁵ Increase in the incidence of thrombotic complications in critically ill ICU patients with COVID-19 has been associated with increased fatality rate. The study done by FA Klok and et al. with 184 ICU patients has shown 13% mortality rate all patients in this study were receiving thromboprophylaxis. The cumulative incidence of the composite outcome was 31% (95% CI 20-41%), of which CTPA and/or ultrasonography confirmed venous thromboembolism in 27% (95% CI 17-37%) and arterial thrombotic events in 3.7% (95% CI 0-8.2%). Pulmonary embolism was the most frequent thrombotic complication (n=25, 81%). This study also shows 31% incidence of thrombotic complications in ICU patients with COVID-19 which is remarkably high and that COVID-19 is associated with increased coagulability.²⁶

DISCUSSION

This review article aims to review evidences on virology and clinical features so that it will help in understanding about the fact about the COVID-19 while identifying and managing it. COVID-19 falls under the corona virus family but it has higher infectivity compared to SARS and MERS with higher reproduction numbers. Virulence has been found to be different throughout the world. The lowest virulence has been seen in China where CFR is 0.7% while Italy has the highest CFR of 7.2%. Virulence is lower compared to SARS and MERS. The most common clinical features have been found to be cough and fever. Less common symptoms like stroke, anosmia, thrombocytopenia and thromboembolic phenomenon has also been seen new clinical features has been still emerging which makes the management of COVID-19 challenging. As a health person we need to more careful and updated on it regularly to properly manage this pandemic situation.

Limitation

This study included the review of the studies which were in English language and only full text articles were included.

CONCLUSION

Our study is focused on reviewing the present knowledge and understanding about COVID 19 also called SARS-CoV-2. We have focused on virology and its clinical features. Despite recent advances and increasing studies, the global pandemic COVID 19 still remains a major headache for governments across the world due to limited testing capacity and lack of appropriate treatment and vaccine.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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