

Impact of the COVID-19 epidemic on outpatient visits of common respiratory diseases

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Abstract

Background/Purpose The outbreak of corona virus disease 2019 (COVID-19) has become a worldwide threat to public health. The purpose of this study is to analyze the impact of COVID-19 epidemic on outpatient visits of common respiratory diseases. **Methods** Through statistics and comparing the data with the same period last year, we present the changes of outpatient visits of 14 common respiratory diseases in an upper first-class hospital in China from January to May, 2020. **Results** From January to May, 2020, the number of outpatient visits of most common respiratory diseases fell below the previous year, and total number of outpatient visits of 14 common respiratory diseases decreased by 58.07% year-on-year. Bronchitis, pneumonia, cough, acute upper respiratory infection and bronchiectasis infection are in our top 5 drop list, decreased by 76.79%, 71.03%, 66.51%, 56.87% and 56.31% respectively. **Conclusion** COVID-19 epidemic had a strong influence on the outpatient visits of common respiratory diseases, particularly for infectious diseases.

Introduction

To date, COVID-19 has spread rapidly throughout the world, causing more than 7067729 confirmed cases and over 400700 deaths. The ongoing COVID-19 has become a global public health event with devastating consequences on health systems and economies [1, 2].

Chinese central and local governments have issued various policies requiring to stem the tide. Through the active collaboration and efforts of residents and governments, the number of infection in the country has been controlled to exceedingly low level, and most areas have zero new infection for many days. All sectors of the country have gradually resumed work and production to minimize economic and social fallout from the outbreak.

To assess the impact of public health interventions for COVID-19 on common respiratory disease will be helpful for us to actively deal with the prevention and treatment of respiratory diseases in future.

Methods

This study was conducted at the First Affiliated Hospital of Zhejiang Chinese Medical University, Zhejiang Province, China. We collected monthly outpatient visits data of 14 common respiratory diseases and present the changes since the COVID-19 outbreak (from January to May, 2020) in the hospital, and compare the data with the same period last year.

Results

From January to May, 2020, total number of outpatient visits of 14 common respiratory diseases decreased by 58.07% year-on-year. Except pulmonary embolism-associated outpatient visits and pulmonary mycosis-associated outpatient visits, visits of other respiratory diseases dropped significantly. The most significant decline is in bronchitis-associated outpatient visits, decreased by

76.79%, followed by pneumonia (decreased by 71.03%), cough (decreased by 66.51%), acute upper respiratory infection (decreased by 56.87%) and bronchiectasis infection (decreased by 56.31%). (Table 1)

Table 1. List of Number and Decline Rate of Outpatient Visits Comparing the Period of (2020.1.1-2020.5.31) With (2019.1.1-2019.5.31) According to Disease			
	2020.1.1-2020.5.31	2019.1.1-2019.5.31	Decline rate
Bronchitis	3981	17149	76.79%
Pneumonia	2831	9772	71.03%
Cough	9741	29086	66.51%
Acute upper respiratory infection	21111	48952	56.87%
Bronchiectasis infection	353	808	56.31%
Asthma	2749	4775	42.43%
Pneumothorax	55	93	40.86%
COPD	2063	3334	38.12%
Pleural effusion	56	90	37.78%
Influenza	1869	2837	34.12%
Interstitial lung disease	427	651	34.41%
Pulmonary malignancy	8078	9886	18.29%
Pulmonary embolism	86	58	-48.28%
Pulmonary mycosis	131	65	-101.54%

COPD = chronic obstructive pulmonary disease

In 2019, the top 5 respiratory diseases of outpatient visits are acute upper respiratory infection, cough, bronchitis, pneumonia and pulmonary malignancy. Comparing with data in 2019, the least decline was in pulmonary malignancy, decreased by 18.29%, while more than half of the decline in other 4 respiratory diseases had taken place in 2020. The visits of all these diseases were declined from January to May, in 2020.

Compared with the same period last year, there was a temporary increase for influenza and acute upper respiratory infection on January, 2020, and then a sudden reduction occurred on February, 2020. Influenza-associated outpatient visits even reduced to 23 on February, 1 on March and 0 on April, 2020. (Fig. 1)

The top 4 diseases of outpatient visits on January, acute upper respiratory infection, cough, bronchitis and pneumonia, showed a steep drop both on February 2019 and 2020. This largely due to the fewer days on February and Spring Festival which brought a long vacation in that month. But the decline was more pronounced in 2020, which is just the period of COVID-19 outbreak in China. The number of visits had gradually recovered and showed a small peak on March, 2019, while it was still at low level in 2020. Despite a monthly slight increase, acute upper respiratory infection-associated outpatient visits didn't surpass 4,000 until May. Pulmonary malignancy-associated outpatient visits had gradually recovered to the same level as last year on March, 2020. (Fig. 2 and Fig. 3)

Discussion

As Wuhan lifted coronavirus lockdown on April 8th, all cities in China have entered the stage of resuming work and production.

Through comparative analysis, we found that the outpatient visits of common respiratory diseases were affected by COVID-19 pandemic, especially for acute infectious diseases. The substantial decline of the outpatient visits of common respiratory diseases mainly due to the following reasons:

1. Lockdown strategy

Human-to-human transmission of COVID-19 has been confirmed. The people most at risk of the infection are those who are in close contact with a COVID-19 patient or who care for COVID-19-infected person[3].

Since the COVID-19 epidemic outbreak, Chinese government responded quickly and has taken powerful measures to combat the disease. The lockdown strategy, which is considered as the most effective way to stop the spread of the corona virus within a short time, worked well in China's battle against the pandemic. Since Wuhan government announced that all forms of the city's public transport stopped operation and the residents were not allowed to leave the city on January 23, 2020, other cities entered the lockdown state in succession. Residents were required to stay at home as much as possible and restrict close contact with other people. The inconvenient traffic hindered the patients from going to the hospital.

The risk for getting those diseases is highest for people who are in close contact with those who have COVID-19, or other respiratory tract infectious diseases such as pulmonary tuberculosis (TB)[4] and influenza[5]. Lockdown strategy limited the spread of COVID-19 as well as TB and influenza.

Lockdown strategy also brings opportunity to rationalize human impact on the environment[6]. During the lockdown period, the improvement of air quality reduces the irritation of air pollutants to the respiratory tract, which is one of the most important causes of cough.

Although the cities had gradually lifted the blockade in China, respiratory tract infectious diseases were not severe. Flu season, which tends to hit in the winter and spring, had almost over, earlier than before. National response strategies and public health interventions applied to control COVID-19 may serve as useful strategies for the prevention and control of influenza[7].

2. Mask usage

It is generally considered that the main mode of transmission of COVID-19 is through contact and in the form of droplets[8]. The experimental results show that household masks have some filtration capacity in the relevant droplet size range, as well as efficacy in blocking droplets and particles from the wearer[9]. Masks are effective as both preventing asymptomatic transmission and preventing COVID-19 in healthy persons[10]. So the routine use of a face mask in daily life has been incorporated into pandemic control plans[11].

Meanwhile, using of mask reduced the incidence of other respiratory tract diseases to some extent. Face masks are used as a protective barrier to reduce the risk of transmission of microorganisms between patients, healthcare workers, and the environment[12]. Population-wide use of face masks could make a remarkable contribution in delaying an influenza pandemic[13].

Wearing a face mask properly decreases the risk of acute episodes of chronic obstructive pulmonary disease, bronchial asthma, and several other respiratory diseases caused by particulate matter (PM) exposure[14]. Mask also provide protection from common allergy triggers such as pet dander, dust mites, and pollen in the air, which are the main cause of acute asthma attacks and allergic rhinitis[15,16].

3. Fear of going to the hospital

Avoiding crowded places, social gatherings, and the use of public transport is helpful to limit cross-infection. The Chinese authorities recommended that people avoid crowded places as much as possible. As a public place, hospitals are always full of people. For worrying about nosocomial infection, many patients choose to wait at home to see if they can get better on their own, or take drug by themselves, or get help from online medical treatment system.

4. Cancellation of non-emergent operations

Medical thoracoscope and bronchoscopy play an important role in the diagnosis and treatment of respiratory department. Non-emergent operations were canceled or postponed to prevent the spread of the highly contagious novel coronavirus.

5. Temporary adjustment of medical insurance policy

China has established a universal health care security system, the scope of its payment including long-term control medicines for many chronic pulmonary disease such as asthma and COPD. In order to ensure the standard and reasonable use of social medical security fund, many drugs had been prescribed as one-month doses.

The government adopted a temporary relaxed policy of increasing the amount of the long-term control medicines that could be prescribed at one time during the time of coronavirus. This strategy reduced the outpatient visits of many chronic diseases.

In addition to the decrease in the incidence of diseases, the decline of the outpatient visit rate may reflect some negative situations. The effect of COVID-19 on the management of other illnesses cannot be ignored. A patient may miss the golden hour of rescue for serious medical conditions like heart attack and stroke only because of he or she isn't willing to go to the emergency room out of fear of corona virus.

Correct first aid measures need to be known by the general public. It is incredibly helpful to strengthen the health education of common and acute diseases by various means.

The applications of digital technology in the healthcare field are well known. Since the outbreak of COVID-19, online pharmaceutical stores and teleconsultation systems, which are easily accessible from desktop system or mobile device, have been used by more people. However, several shortcomings have emerged including drug shortage, lack of relevant legal protection, and many prescription drugs aren't covered by insurance. It is a pressing issue to standardize and professionalize the digital platforms to ensure patients are receiving high-quality online medical service.

Conclusions

Worldwide healthcare industry is facing tremendous challenges and pressures as a result of the COVID-19 pandemic. The decline of the outpatient visit rate indicates a decrease in the incidence of respiratory diseases to some extent, so some pandemic-controlled strategies may serve as useful measures for limiting many respiratory diseases, especially for infectious diseases. The study reported here reveals the changes of outpatient visits of common respiratory diseases in one hospital in China, and it deserves more widely and longer-term clinical research.

Abbreviations

COPD: chronic obstructive pulmonary disease

Declarations

Availability of data and materials

All data generated or analysed during this study are included in this published article and supplementary information.

Ethics approval and consent to participate

Only the frequencies of outpatient visits are used in the study. No details of patient's personal information are involved in this work. So no ethics committee approving is needed.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Conflict of Interest: None declared

Authors' contributions

Libin Jiang analyzed and interpreted the data. Weriya Wang and Yulu Zheng were major contributors in acquiring the data and writing the manuscript.

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Figures

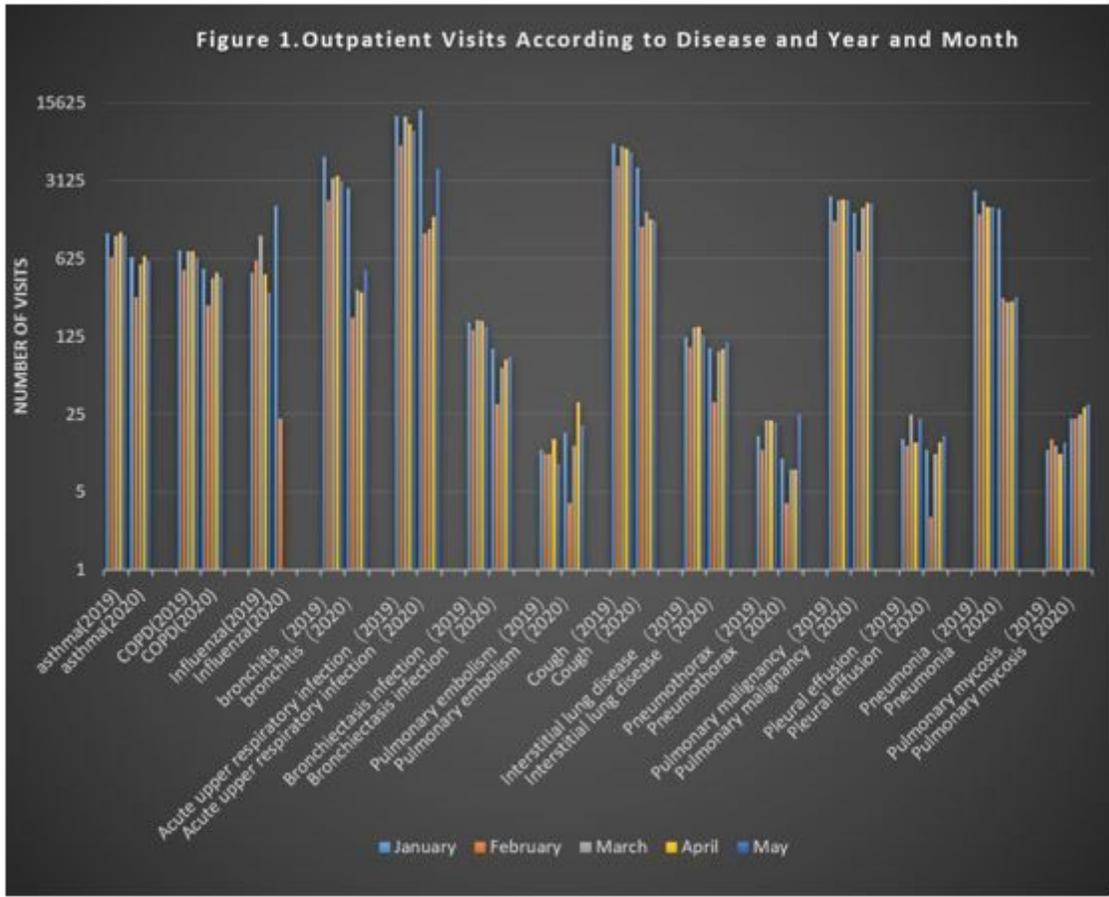


Figure 1

Figure 2. Ourpatient Vistis According to Disease and Month in 2020

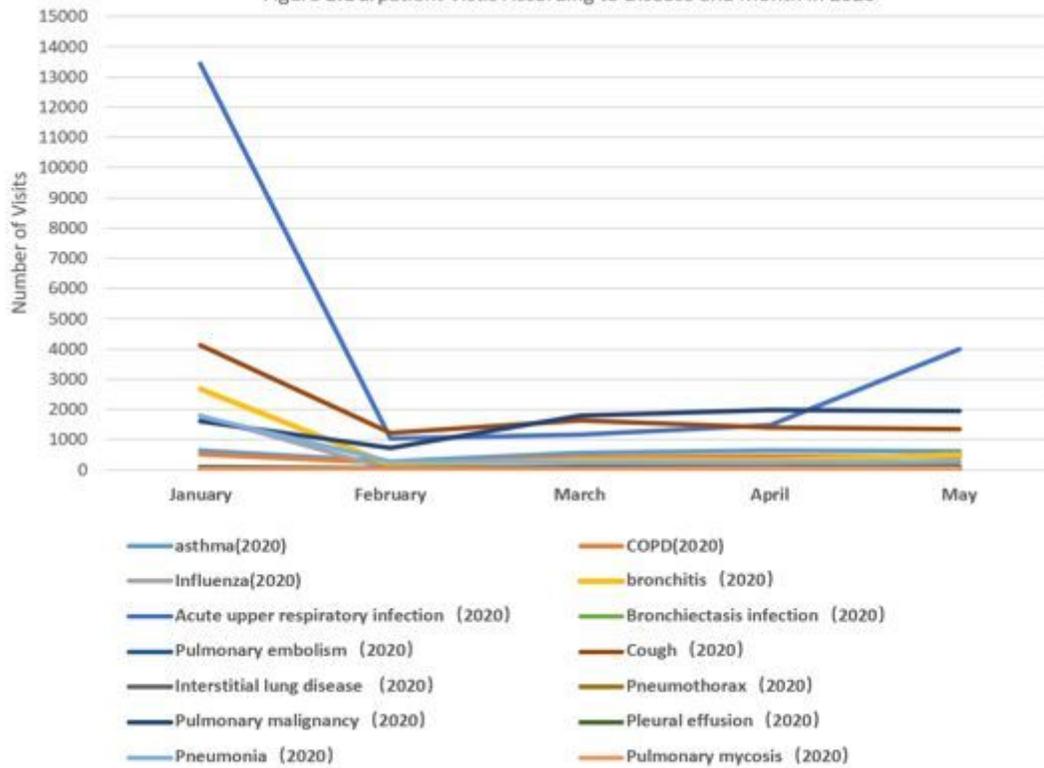


Figure 2

Figure 3. Outpatient Visits According to Disease and Month in 2019

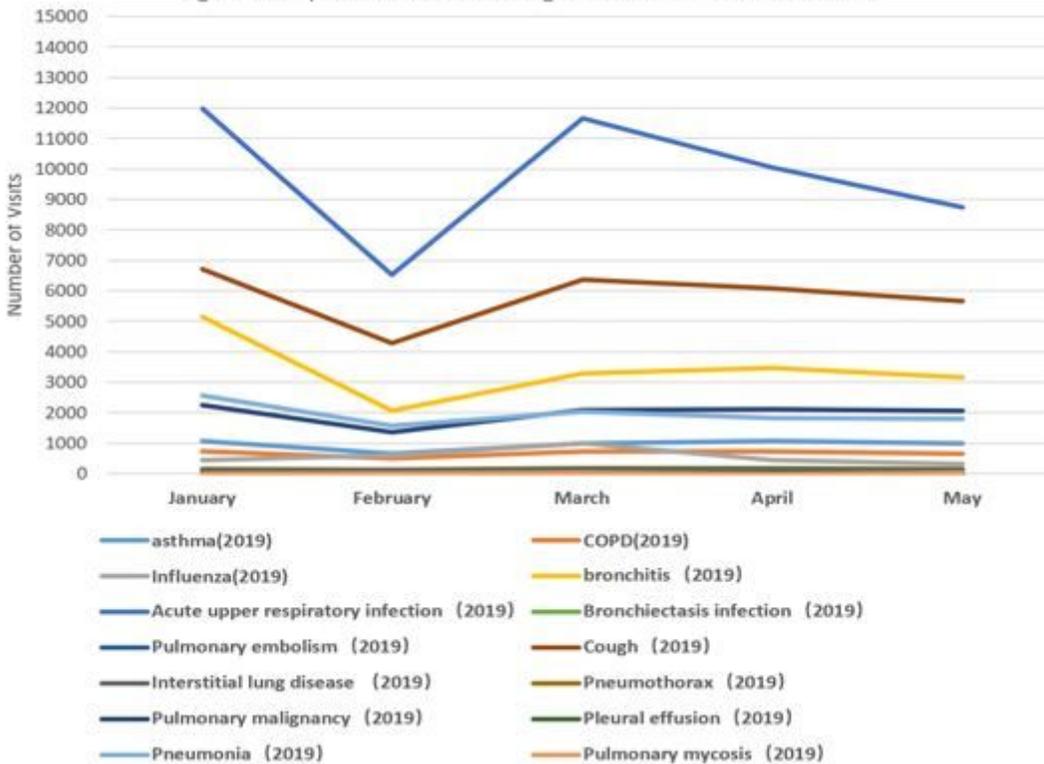


Figure 3