



Contents lists available at BioMedSciDirect Publications

International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Review article

AN OVERVIEW OF CORONAVIRUS DISEASE (COVID-19)

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ARTICLE INFO

Keywords:

COVID-19
common cold
influenza
and Flu.

ABSTRACT

This case series focuses on the frequency of symptoms in COVID-19 in comparison to SARS, influenza and common cold. The emergence of severe acute respiratory syndrome in late 2002 and the recent outbreaks of avian influenza in Asia are timely reminders of the ever present risks from respiratory viral diseases. Influenza is a descriptive term for respiratory epidemic disease presenting with cough and fever. Influenza viruses are probably the most important of the pathogens that cause this condition. Clinical influenza occurs almost every winter in England and Wales and the outbreaks last 8-10 weeks. In recent years, influenza B virus outbreaks have occurred in January and February, whereas influenza H3N2 virus outbreaks have generally started long before Christmas. Influenza H3N2 virus outbreaks pressurize health service resources in winter more than influenza B viruses, that do not have the same impact in elderly people.

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1. Introduction

While the flu is very common, it's also important to remember that it can lead to life-threatening complications. Getting your flu shot is the best way to avoid getting sick and protect your loved ones and neighbours, too. If you have underlying health conditions or are pregnant, talk to your provider about reducing your risk of flu. Having the flu isn't fun for anyone, but most people can get through with some movies and chicken soup at home.

Influenza (flu) and COVID-19 are both contagious respiratory illnesses, but they are caused by different viruses. COVID-19 is caused by infection with a coronavirus (SARS-CoV-2) first identified in 2019. Flu is caused by infection with a flu virus.¹

Incubation Period:

Flu: Typically, a person may experience symptoms anywhere from one to four days after infection.

COVID-19: Typically, a person may experience symptoms anywhere from two to five days, and up to 14 days after infection.²

It is demonstrated that IL-6 initiates the endothelial injury mainly via reduction of the endothelial nitric oxide synthase and adiponectin expression (8), and the injection of recombinant IL-6 exacerbates atherosclerosis (9). These findings suggest that IL-6 also contributes to the increased incidence of CVD in CKD patients. However, elevated IL-6 level is not only a consequence of CKD, it also acts as a trigger for the progression of CKD and related complications (10). In patient's undergoing dialysis, the

therapeutic hemodialysis and peritoneal dialysis could further stimulate inflammatory responses and increase IL-6 production which accelerate tubulointerstitial fibrosis (11, 12).

However, suppression of IL-6 expression in the TEC would prevent the interstitial fibrosis and tubular atrophy whereas chronic administration of IL-6 enhanced (13). Even though many studies have reported that IL-6 contributes to both acute and chronic kidney injuries, conflicting opinions still exist (14,15). It was against this background the present study was carried out to determine interleukin-6 level in chronic kidney disease patients in Khartoum, Sudan. Moreover, the effect of age, sex, and ethnicity on the systemic level of IL-6 in chronic kidney disease patients is largely unknown and examined.

DIFFERENCES:

Flu: If a person has COVID-19, they could be contagious for a longer time than if they have flu. People with flu virus infection are potentially contagious for about one day before they show symptoms. However, it is believed that flu is spread mainly by people who are symptomatic with flu virus infection.

Older children and adults with flu appear to be most contagious during the first 3-4 days of their illness, but some people might remain contagious for slightly longer periods.

Infants and people with weakened immune systems can be contagious for even longer.²

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





COVID-19: On average, people can begin spreading the virus that causes COVID-19 2-3 days before their symptoms begin, but infectiousness peaks one day before their symptoms begin.

People can also spread the virus that causes COVID-19 without experiencing any symptoms.

On average, people are considered contagious for about eight days after their symptoms began.

COMPLICATIONS:

Flu: Most people who get flu will recover on their own in a few days to two weeks, but some people will experience severe complications, requiring hospitalization. Some of these complications are listed above. Secondary bacterial infections are more common with influenza than with COVID-19.

COVID-19 VS. COLD VS. FLU SYMPTOMS			
SYMPTOMS	COVID-19*	COLD	FLU
 Sore Throat	Sometimes	Common	Common
 Cough	Common	Common	Common
 Sneezing	–	Common	Sometimes
 Fever	Common	–	Common
 Body Aches	Sometimes	Sometimes (mild)	Common
 Tiredness	Sometimes	Sometimes (mild)	Common
 Headache	Sometimes	–	Common
 Runny/Stuffy nose	Sometimes	Common	Sometimes
 Shortness of Breath	Sometimes	–	Sometimes
 Loss of Taste (and/or Smell)	Sometimes	–	–

*Sources: Centres for Disease Control and Prevention, World Health Organization
*Information on Covid-19, including its symptoms is still emerging.

Diarrhoea is more common in young children with flu than in adults with flu.

COVID-19: Additional complications associated with COVID-19 can include:

- Blood clots in the veins and arteries of the lungs, heart, legs or brain
- Multisystem Inflammatory Syndrome in Children (MIS-C) and in Adults (MIS-A)³

Anyone who has had COVID-19, even if their illness was mild, or if they had no symptoms can experience post-COVID conditions. Post-COVID Conditions are a range of symptoms that can last weeks or months after first being infected with the virus that causes COVID-19 or can appear weeks after infection.

Flu (influenza): The flu is an illness you get from the influenza virus. It causes symptoms like head and body aches, sore throat, fever and respiratory symptoms, which can be severe. Flu is most common in winter months, when many people can get sick at once (an epidemic).

When is flu season?

Flu season — when cases of the flu go up dramatically — in the Northern Hemisphere (which includes the U.S.) is October through May. The highest number of cases (peak) usually happen between December and February.

What is the difference between the flu and the common cold?

The flu and the common cold can have similar symptoms, like runny nose and cough. But cold symptoms are usually mild and flu symptoms can be severe and lead to serious complications. Different viruses cause colds and the flu.

How do I know if I have the flu or COVID-19?

Since they have similar symptoms, the only way to know for sure if you have the flu or COVID-19 is to get tested. They both have a risk of serious illness. But different viruses cause these infections, and providers treat them with different medications.³


Who is at higher risk for complications from the flu?

Certain health conditions can put you at higher risk for severe illness from the flu. This includes life-threatening complications that require hospitalization. You're at higher risk for serious illness if you:

Have asthma, COPD or another chronic lung disease. Have a history of kidney, liver, neurological, heart or blood vessels disease, including stroke. Have a condition that causes issues with muscle function or makes it difficult to cough, swallow or clear fluids from your airways.


Have diabetes. Have a weakened immune system (from HIV/AIDS, cancer or immunosuppressive medications).

VIRUS PROPERTIES



Influenza Virus

- 4 strains/multiple subtypes
- (-) Strand, segmented RNA Genome
- HA and NA surface proteins
- Enveloped



SARS-CoV-2

- Multiple variants
- (+) Strand, non-segmented RNA Genome
- Spike (s) proteins
- Enveloped

Have a blood disorder, like sickle cell disease?

Have a BMI greater than 40 (have obesity);

Are under 5 years old or over 65 years' old

Are you pregnant; Are under 19 years old and take aspirin regularly.

Live in a long-term care facility.

Non-Hispanic Black people, non-Hispanic American Indians, Alaska Native people and Hispanic or Latino people have the highest rates of severe illness from the flu compared to non-Hispanic White people and non-Hispanic Asian people.

What are the symptoms of the flu?

Symptoms of the flu usually come on quickly, and can include:

Fever, Chills, Body aches, Cough, Headache, Sore throat.

Runny or stuffy nose (congestion); Tiredness or feeling run down.

Diarrhoea or vomiting (only in kids). You may not have all of these symptoms.⁴

SIMILARITIES:

Both COVID-19 and flu can have varying degrees of symptoms, ranging from no symptoms (asymptomatic) to severe symptoms. Common symptoms that COVID-19 and flu share include:

Fever or feeling feverish/having chills, Cough, Shortness of breath or difficulty breathing, Fatigue (tiredness), Sore throat, Runny or stuffy nose, Muscle pain or body aches, Headache, Vomiting; Diarrhoea (more frequent in children with flu, but can occur in any age with COVID-19); Change in or loss of taste or smell, although this is more frequent with COVID-19.

What causes the flu?

The influenza virus causes flu. Influenza A, B and C are the most common types that infect people. Influenza A and B are seasonal (most people get them in the winter) and have more severe symptoms. Influenza C doesn't cause severe symptoms and it's not seasonal — the number of cases stays about the same throughout the year.

H1N1 ("swine flu") and bird flu are both subtypes of influenza A.

TRANSMISSION:

Both COVID-19 and the flu can be transmitted by presymptomatic, asymptomatic and mildly symptomatic individuals.

Is the flu contagious?

Yes, the flu is contagious (it spreads from person to person). For every person infected, they spread the flu to one to two more people.

How does the flu spread?

The influenza virus spreads from direct or indirect contact with someone else who's infected. Common ways to get the flu include:

From someone nearby coughing, sneezing or talking. Droplets can either get onto your hands or move through the air to get into your nose or mouth. The flu then moves into your lungs. By touching a surface that's contaminated by the flu virus, then touching your face, nose, mouth or eyes. This includes things like door knobs, desks, computers and phones.

By touching the hands or face of someone who has the flu, then touching your face, nose, mouth or eyes.⁴

How long after exposure will I get the flu?

If infected, you'll usually get symptoms of the flu one to four days after exposure (incubation period).

How is the flu diagnosed?

Your provider diagnoses the flu by listening to your symptoms and testing a sample of mucus from your nose. They'll put a long stick with a soft tip (swab) in your nose to test for influenza. Results may take a few minutes or your provider may send the sample to a lab, where you'll get results in a day or two.

MANAGEMENT AND TREATMENT:

How is the flu treated?

Providers can treat the flu with antiviral medications under certain circumstances. Antivirals can reduce your risk of severe illness and shorten the amount of time you're sick. Many people can treat the flu without prescription medications. Providers prescribe antivirals if you:

Have had symptoms for under 48 hours. Antivirals are less likely to work if you start them after two days of symptoms. The virus has already made more copies of itself and your body has started to fight it off with its own antibodies. Have an underlying condition or are at risk for severe illness. Providers may prescribe antivirals even if you've had symptoms for longer than 48 hours. Have severe symptoms, even if you've been sick for longer than 48 hours. Live with or care for people who are at risk for severe complications of the flu.⁴



CATEGORIZATION OF CHEST X-RAY FINDINGS FOR INFLUENZA PATIENTS:



What medications treat the flu?

Antiviral drugs for influenza include:

Oseltamivir phosphate (Tamiflu®). You take oseltamivir by mouth as a pill or a liquid. You usually take it for several days.

Zanamivir (Relenza®). You breathe zanamivir in through your mouth with an inhaler. You usually have to take it for several days. Zanamivir isn't recommended for people with breathing issues, like asthma or COPD.

Peramivir (Rapivap®). Your provider gives you peramivir directly into your veins using an IV. You usually only need one dose of peramivir.

Baloxavir marboxil (Xofluza®). You take baloxavir marboxil by mouth as a pill or a liquid. You only take one dose. Baloxavir isn't recommended if you're pregnant, breastfeeding/chestfeeding, hospitalized or have certain medical conditions.⁵

Tell your provider about any health conditions you have before starting an antiviral medication.

SIDE EFFECTS OF TREATMENT:

Each antiviral medication has different side effects, but common ones include nausea and diarrhea. Inhaled medications can cause spasms that tighten and narrow your airways (bronchospasm).⁶

How do I manage symptoms of the flu?

Many people can manage the symptoms of flu at home with over-the-counter (OTC) medications and other therapies, including:

Getting plenty of rest.

Drinking fluids like water or broth to help prevent dehydration.

Applying heat packs or hot water bottles can help with aching muscles.

Taking acetaminophen (Tylenol®) or NSAIDs (Advil®, Motrin®, Aleve®) can help lower your fever and relieve head and body aches.

Using spray or oral decongestants like phenylephrine or pseudoephedrine can help with a runny or stuffy nose.

Taking cough suppressants (antitussives) like dextromethorphan can help calm a nagging cough.

Using expectorants like guaifenesin make it easier to clear mucus out of your lungs.

Not everyone should take certain OTCs, so check with your provider before you use them. It's also a good idea to make sure certain medications are okay to use together or with supplements. Don't give aspirin to children under the age of 16 unless their provider says it's okay.⁷

PREVENTION:

How can I prevent the flu?

The best way to prevent the flu is to get the flu vaccine every year. Vaccines train your immune system to recognize infections and fight them off before you get sick. The influenza virus can change (mutate) a little bit every year, which is why you need to get vaccinated every year.

Even if you get sick with a different version of the flu than the one in the vaccine, vaccination reduces your risk of getting seriously ill. Your provider can give you the flu vaccine as a shot or as a mist they spray into your nose.⁸

Other ways to reduce your risk of getting the flu include:

Wash your hands often with soap and water. If you aren't able to use soap and water, use an alcohol-based hand sanitizer. Cover your nose and mouth when you sneeze or cough. Cough or sneeze into your elbow or a tissue rather than your bare hand.

Avoid being around other people when you or they are sick with the flu or other infectious diseases.

Consider wearing a mask if you're sick and can't avoid being around others. Avoid touching your face, eyes, nose and mouth.

Don't share food or eating utensils (forks, spoons, cups) with others.⁴

What can we expect if I have the flu?

Most people are able to manage flu symptoms at home and recover within a few days to a week. Because it can cause severe illness, it's important to keep an eye on your symptoms and get medical attention if you need it. This is especially important if you have an underlying health condition.

If you're sick with the flu, you should avoid being around others, except to seek medical care.

How long does the flu last?

Flu can last from a few days to two weeks. Symptoms like fever and body aches can come on suddenly but usually go away faster than other symptoms. A cough or runny nose can last longer.⁹

How long is the flu contagious?

You can be contagious with the flu from a day before your symptoms start to up to a week after. You're most contagious for three to four days after your symptoms start. People with weakened immune systems and infants may be contagious for longer.

When can people go back to work/school?

To avoid spreading the flu to others, you shouldn't go back to work or school until it's been at least 24 hours since you've had a fever (without taking fever-reducing medications). Your employer or school may have different requirements for returning.¹⁰

COMPLICATIONS:

The flu virus itself can cause complications or it can weaken your immune system and allow bacteria to infect different parts of your body (secondary infection). Complications and secondary infections include:

Ear infections, Sinus infections, Severe lung infection (pneumonia). Pneumonia can lead to acute respiratory distress syndrome (ARDS) and other life-threatening conditions; Pregnancy loss (miscarriage); Neural tube defects (NTDs) in the developing fetus of a pregnant person.⁶

How many people die from the flu each year?

In a typical flu season in the U.S., it's estimated that between 20,000 and 50,000 people die from the flu. Another 300,000 to 500,000 require hospitalization for serious illness.

When should seek my healthcare provider?

If you think you have the flu, it's important to get tested early on so that antiviral medications are most effective if your provider prescribes them. Contact a healthcare provider right away if:

You have flu symptoms and an underlying condition that puts you at higher risk for severe illness.

Your symptoms don't start to improve after seven to 10 days or if you have a fever lasting longer than three days. You're pregnant and have a fever or other flu symptoms.⁷

When should go to ER?

Go to the ER or seek immediate medical attention if you have symptoms of severe illness, including:

High fever (over 103 F/40 C); Difficulty breathing; Not peeing or peeing very little.

Pain in your chest or stomach (abdomen) that doesn't go away; Persistent dizziness.

Confusion; Severe muscle pain or weakness; Seizures. Bluish skin, lips or nails (cyanosis, which can be a sign of low oxygen levels in your blood or tissues); Fever or cough that gets better or goes away but then get worse.¹¹

Worsening of other health conditions.

What questions should I ask my doctor?

How do I take my medication?

What over-the-counter medications can I use?

How do I treat my symptoms at home?

What severe symptoms should I look out for?

When should I go to the ER?

When should I follow up with you?

How long might it take to feel better?

CONCLUSION:

There's plenty of evidence of people testing positive for, say, COVID and the flu or flu and RSV simultaneously. "Absolutely, you can catch more than one virus at the same time," says Dr. Tina Tan, a pediatric infectious disease specialist at Northwestern University.

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