

Sign, Symptom, Prevention and Management of Pneumonia and Herbal Drugs for its Treatment. A Review Article

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Abstract

Pneumonia is a common lung infection characterized by collection of pus and other fluids in the lung air sacs (alveoli). Lung air sacs are structures that help in the exchange of oxygen and carbon dioxide. Collection of pus in them makes breathing difficult. Pneumonia can be caused by many kinds of microorganisms including bacteria, viruses, fungi or parasites. Nowadays, traditional medicines have been reported to provide reliable therapies for viral pneumonia, but the therapeutic mechanism remains unknown. Following the publication of a volume of Pneumonia focused on Prevention, Sign Symptoms, diagnosis, definition and Herbal drugs to cure of pneumonia and came to a consensus on the need to revise both of these. In this literature we studies that various Herbs used in the prevention and treatment of Pneumonia. The Drugs which are commonly used in our daily life viz Tilsi, Turmeric, Ginger, Garlic, Chili, Dianthus, and Methi. These are the important value in the treatment of various communicable diseases viz Chronic Bronchitis, Influenza, asthma, Pneumonia.

Keywords: Pneumonia, Treatment, Preventions, Pneumonia Medication via vaccination or medication, Herbal drugs used in Pneumonia.

A. INTRODUCTION

Natural Plants have been used in traditional medicine for thousand years. From the time ancient, human civilizations have been exploring and using various plants and plant products to cure the lethal communicable and non-communicable diseases. Different plants species and their uses as medicine are greatly well-known to indigenous communities in different parts of the world. Local people are specialist for mounting inventive practices and products from their surrounding environment particularly, the plant world. Many drugs have plant origin, and several plants are currently undergoing investigation to ascertain their therapeutic abilities. The knowledge about the use of traditional herbal medicines gradually deceases, although some of the traditional tribal communities and some human beings which believed in the usage of herbal medicines are

still practicing the art of herbal healing effectively. Today more than 80% of the world's people depend on traditional medicine for their primary healthcare needs.

There are considerable economic benefits in the development of indigenous medicines and in the use of medicinal plants for the treatment of various diseases. Lack of primary healthcare centers and transportation facilities, prohibitive cost of treatments, side effects of several allopathic drugs have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. It has been estimated that 1.5 billion populations of developing countries uses traditional medicines either because the people cannot afford synthetic medicine or because traditional medicines are more acceptable.

Respiratory diseases can be caused by several reasons, either by the presence of microorganisms or toxins in the environment which generally attack organisms with nutritional deficiencies, weak or immunologically predisposed to suffer any these discomforts. Among the most common are the respiratory flu, tonsillitis, bronchitis, influenza and pneumonia. The main symptoms of these diseases are often very similar and are showed in the following ways viz Flushing, Cough, Fever, and Headache, throat, ears, or muscle aches, malaise and Tiredness.

B. History of Pneumonia:

Pneumonia has been a common disease throughout human history. The word is from Greek *pneúmōn* meaning "lung". The symptoms were described by Hippocrates (460–370 BC): "Peripneumonia, and pleuritic affections, are to be thus observed. If the fever be acute, and if

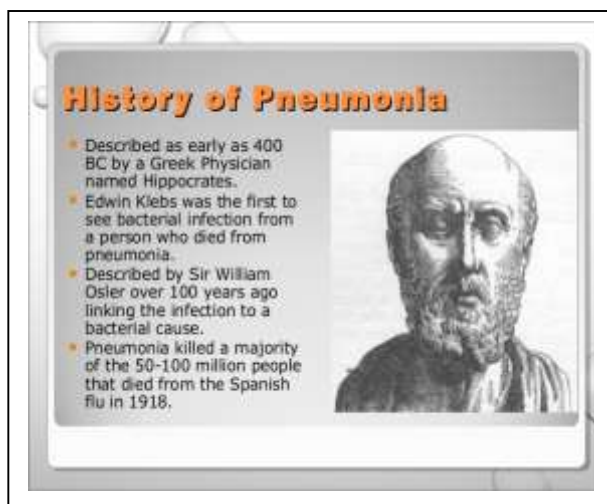


Fig. 1 Hippocrates (460– 370 BC).

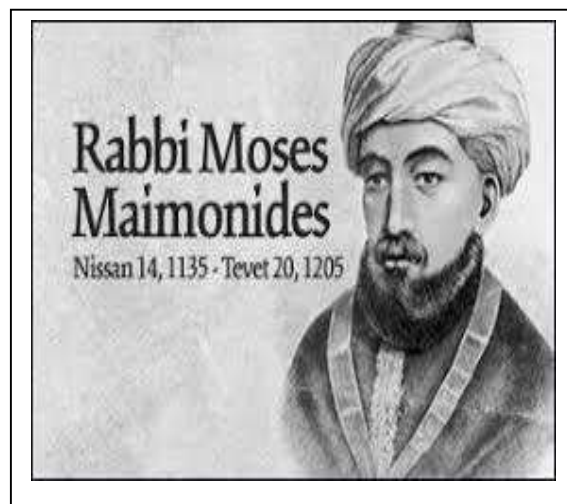


Fig. 2 Maimonides (1135–1204 AD)

there be pains on either side, or in both, and if expiration be if cough be present, and the sputa expectorated be of a blond or livid color, or likewise thin, frothy, and florid, or having any other character different from the common. When pneumonia is at its height, the case is beyond remedy if he is not purged, and it is bad if he has dyspnea, and urine that is thin and acrid, and if sweats come out about the neck and head, for such sweats are bad, as proceeding from the choking, rales, and the violence of the disease which is obtaining the upper hand." However, Hippocrates referred to Pneumonia as a disease "Named by the Ancients". He also reported the results of surgical drainage of empyemas. Maimonides (1135–1204 AD) observed: "The basic symptoms

that occur in pneumonia and that are never lacking are as follows: acute fever, sticking pleuritic pain in the side, short rapid breaths, serrated pulse and cough.

Pneumonia was first described by Hippocrates (460– 370 BC). The first descriptions of its clinical and pathological features were made 22 centuries later in 1819 by Laennec and Rokitansky in 1842 was the first to differentiate lobar and bronchopneumonia. During the next 47 years at least 28 terms were used to identify pneumonia, and by 1929 the total number of terms listed in the Manual of the International List of Causes of Death had grown to 94, with 12 subterms. The ICD-10 classification of diseases has removed some of the historical evocative terms and ‘pneumonia’ is listed as the primary term in seven codes but it is also a descriptive term in seven other codes relevant to specific infectious and non-infectious etiologies, times of life and complications of diseases and procedures. ICD-10 codes usually include subcategories so there are still many classifications for pneumonia. It is also of note that ‘other acute lower respiratory infections’ comprise three other codes for acute bronchitis, bronchiolitis and indefinite conditions.

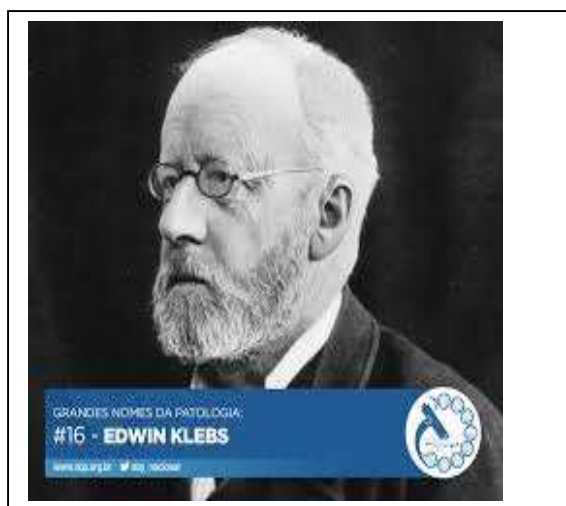


Fig. 3 Edwin Klebs (1837 to 1875)

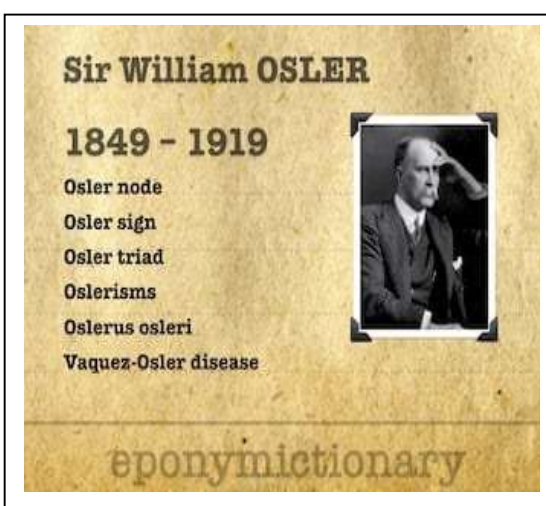


Fig. 4 William Osler (1849 to 1919)

Edwin Klebs was the first to observe bacteria in the airways of persons having died of pneumonia in 1875. Initial work identifying the two common bacterial causes, Streptococcus Pneumoniae and Klebsiella Pneumoniae, was performed by Carl Friedlander and Albert Fraenkel in 1882 and 1884, respectively. Friedlander's initial work introduced the Gram stain, an important laboratory test still used today to identify and classify bacteria. Christian Gram's paper describing the procedure in 1884 helped to differentiate the two bacteria, and showed that pneumonia could be caused by more than one microorganism.

Sir William Osler, known as "the father of modern medicine", esteemed the death and incapacity caused by pneumonia, describing it as the "captain of the men of death" in 1918, as it had overhauled tuberculosis as one of the leading causes of death in this time. This phrase was originally coined by John Bunyan in reference to "consumption". Sir William Osler also described pneumonia as "the old man's friend" as death was often quick and painless when there were much slower and more painful ways to die. Pneumonia has been touted as one of the most dreaded infections worldwide. As per WHO report, "Pneumonia killed 808 694 children under the age of 5 in 2017, accounting for 15% of all deaths of children under five years old." To create consciousness against this global or universal pandemic, World Pneumonia Day is marked annually on

November 12. Pneumonia is basically an infection of the lungs that can cause mild to severe illness in people across ages, defines Centre for Disease Control and Prevention. This disease can spread in a number of ways, it can be air borne or can spread through droplets of cough or even through blood.

C. Definition of Pneumonia.

Pneumonia is an inflammatory condition of the lung primarily affecting the small air sacs known as alveoli. Symptoms typically include some combination of productive or dry cough, chest pain, fever and difficulty breathing. The sternness of the condition is variable. Pneumonia is usually caused by infection with viruses or bacteria, and less commonly by other microorganisms. Diagnosis is often based on symptoms and physical examination. Chest X-rays, blood tests, and culture of the sputum may help confirm the diagnosis. The disease may be classified by where it was acquired, such as community or hospital acquired or healthcare-associated pneumonia.

Pneumonia is a lung infection that can range from mild to so severe that you have to go to the hospital. It happens when an infection causes the air sacs in your lungs to fill with fluid or pus. That can make it hard for you to breathe in enough oxygen to reach your bloodstream. Anyone can get this lung infection. But infants younger than age 2 and people over age 65 are at higher risk. That's because their immune systems might not be strong enough to fight it.

D. Symptoms of Pneumonia

Common symptoms of pneumonia include:

- Chest pain when you breathe or cough
- Cough that produces phlegm or mucus
- Fatigue and loss of appetite in male or female
- Fever, sweating, and chills
- Nausea, vomiting, and diarrhea in infants
- Shortness of breath in seniors Citizen



Fig. 5 Common Symptoms of Pneumonia

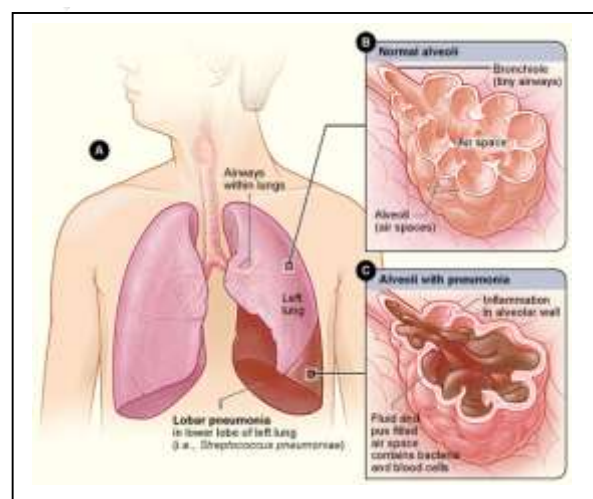


Fig. 6 Infected lungs in Pneumonia

Along with these symptoms, older adults and people with weak immune systems might be confused or have changes in mental awareness, or they might have a lower than usual body temperature.

People with infectious pneumonia often have a productive cough, fever accompanied by shaking chills, shortness of breath, sharp or stabbing chest pain during deep breaths, and an increased rate of breathing.

The typical signs and symptoms in children under five are fever, cough, and fast or difficult breathing. Fever is not very specific, as it occurs in many other common illnesses and may be absent in those with severe disease, malnutrition or in the elderly. In addition, a cough is frequently absent in children less than 2 months old. More severe signs and symptoms in children may include blue-tinged skin, unwillingness to drink, convulsions, ongoing vomiting, excesses of temperature, or a decreased level of consciousness.

Bacterial and viral cases of pneumonia usually result in similar symptoms. Some causes are associated with classic, but non-specific, clinical characteristics. Pneumonia caused by *Legionella* may occur with abdominal pain, diarrhea, or confusion. Pneumonia caused by *Streptococcus Pneumoniae* is related with rusty colored sputum. Pneumonia caused by *Klebsiella* may have bloody sputum often described as "currant jelly". Bloody sputum may also occur with tuberculosis, Gram-negative pneumonia, lung abscesses and more commonly acute bronchitis. Pneumonia caused by *Mycoplasma Pneumoniae* may occur in association with swelling of the lymph nodes in the neck, joint pain, or a middle ear infection. Viral pneumonia presents more commonly with wheezing than bacterial pneumonia. Pneumonia was historically divided into "typical" and "atypical" based on the belief that the presentation predicted the underlying cause. However, evidence has not supported this distinction; therefore it is no longer emphasized.

Causes of Pneumonia:

The bacterium [Streptococcus pneumoniae](#), a common cause of pneumonia, imaged by an [electron microscope](#). Pneumonia is due to infections caused primarily by [bacteria](#) or [viruses](#) and less commonly by [fungi](#) and [parasites](#). Although more than 100 strains of infectious agents have been identified, only a few are responsible for the majority of cases. Mixed infections with both viruses and bacteria may occur in roughly 45% of infections in children and in 15% of infections in adults.

Most patients (62%) had no detectable pathogens in their sample, and unexpectedly, respiratory viruses were detected more frequently than bacteria. Specifically, 23% had one or more viruses, 11% had one or more bacteria, 3% had both bacterial and viral pathogens, and 1% had a fungal or mycobacterial infection. "The most common pathogens were [human rhinovirus](#) (in 9% of patients), influenza virus (in 6%), and *Streptococcus pneumoniae* (in 5%)."

The term pneumonia is sometimes more broadly applied to any condition resulting in inflammation of the lungs however; this inflammation is more accurately referred to as pneumonitis.

Factors that predispose to pneumonia include smoking, immunodeficiency, alcoholism, chronic obstructive pulmonary disease, sickle cell disease, asthma, chronic kidney disease, liver disease, and biological

aging. Additional risks in children include not being breastfed, exposure to cigarette smoke and other air pollution, malnutrition, and poverty. The use of acid-suppressing medications such as proton-pump inhibitors or H2 blockers is associated with an increased risk of pneumonia. Approximately 10% of people who require mechanical ventilation develop ventilator associated pneumonia, and people with a gastric feeding tube have an increased risk of developing aspiration pneumonia.

E. Diagnosis of Pneumonia

Following are general method to diagnose the Pneumonia.

- Blood tests to look for signs of a bacterial infection
- A chest X-ray to find the infection in your lungs and how far it's spread
- Pulse oximetry to measure the level of oxygen in your blood

A sputum test to check the fluid in your lungs for the cause of an infection

If your symptoms started in the hospital or you have other health problems, your doctor might give you more tests, such as:

- An arterial blood gas test to measure the oxygen in a small amount of blood taken from one of your arteries
- Bronchoscopy to check your airways for blockages or other problems
- A CT scan to get a more detailed image of your lungs
- A pleural fluid culture, in which the doctor removes a small amount of fluid from the tissues around your lungs to look for bacteria that might cause pneumonia
- Complications of Pneumonia.
- Pneumonia can have complications, including:
 - Bacteremia, in which bacteria spread into your blood. This can cause septic shock and organ failure.
 - Trouble breathing, which might mean you need to use a breathing machine while your lungs heal.
 - Fluid buildup between the layers of tissue that line your lungs and chest cavity. This fluid can also become infected.
 - Lung abscess, when a pocket of pus forms inside or around your lung.

F. Prevention of Pneumonia:

Prevention includes vaccination, environmental measures and appropriate treatment of other health problems. It is believed that, if appropriate preventive measures were instituted globally, mortality among children could be reduced by 400,000; and, if proper treatment were universally available, childhood deaths could be decreased by another 600,000.

(I) Vaccination

Vaccination prevents against certain bacterial and viral pneumonias both in children and adults. Immunizing health care workers decreases the risk of viral pneumonia among their patients.

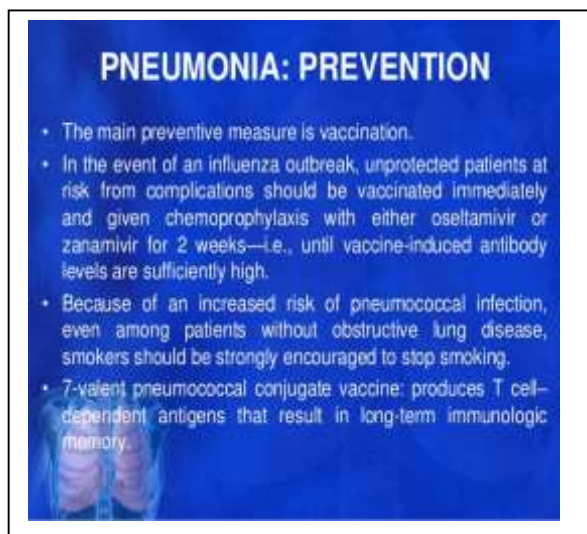


Fig. 7 Prevention of Pneumonia

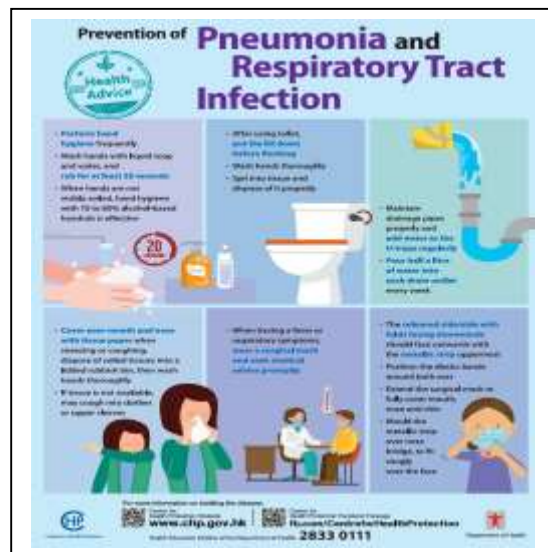


Fig. 8 Prevention of Pneumonia

Vaccinations against Haemophilus Influenzae and Streptococcus Pneumoniae have good indication to support their use. There is strong indication for vaccinating children under the age of 2 against Streptococcus Pneumoniae. Vaccinating children against Streptococcus Pneumoniae has led to a decreased rate of these infections in adults, because many adults acquire infections from children. A Streptococcus Pneumoniae vaccine is available for adults, and has been found to decrease the risk of invasive pneumococcal disease by 74%, but there is insufficient evidence to suggest using the pneumococcal vaccine to prevent pneumonia or death in the general adult population worldwide. The CDC recommends that young children and adults over the age of 65 receive the pneumococcal vaccine, as well as older children or younger adults who have an increased risk of getting pneumococcal disease. The pneumococcal vaccine has been shown to reduce the risk of community acquired pneumonia in people with chronic obstructive pulmonary disease, but does not reduce mortality or the risk of hospitalization for people with this condition.

(II) Medications of Pneumonia:

When influenza outbreaks occur, medications such as amantadine or Rimantadine may help prevent the condition, but they are associated with side effects. Zanamivir or oseltamivir decrease the chance that people who are exposed to the virus will develop symptoms; however, it is recommended that potential side effects are taken into account. Generally amantadine or Rimantadine are administered orally in divided doses or as per the calculation of Posology.

G. Management of Pneumonia:

Your doctor can tell you which treatment is right for you.

MANAGEMENT OF PNEUMONIA

- Don't smoke.
- Practice good hygiene.
- Stay rested and fit.
- Wearing surgical masks by the sick may also prevent illness.
- Appropriately treating underlying illnesses (such as HIV/AIDS, diabetes mellitus, and malnutrition) can decrease the risk of pneumonia.
- Get a Pneumonia Vaccination.

Fig. 9 Management of Pneumonia

Fig. 10 World Pneumonia Day

If you have bacterial pneumonia, you'll get antibiotics. Make sure you take all of the medicine your doctor gives you, even if you start to feel better before you're through with it. If you have viral pneumonia, antibiotics won't help. You'll need to rest, drink a lot of fluids, and take medicine for your

COMMUNITY ACQUIRED PNEUMONIA

Micro

Virus

- Influenza
- Coronavirus
- Adenovirus
- RSV

Bacteria

- S. Pneumo
- M. Pna
- Legionella

➤ MRSA

➤ Pseudo

Clinical Manifestations

Diagnosis

- Clinical syndrome → "inflammation + lung"
- CXR infiltrate → CT in select cases

Risk Factors

All

- Increased age
- COPD/Asthma
- EtOH, Tobacco
- CHF, CVA, DM

Pseudomonas

- Bronchiectasis
- Colonization
- Immunosuppressed
- Multi-lobar

Natural Course

Treatment

Outpatient

- Amoxicillin/Clavulanate + Macrolide or Doxycycline
- Respiratory Fluoroquinolone

Risk factors

- Amoxicillin
- Macrolide
- Doxycycline

Pathophysiology

Complications

- Parapneumonic eff.
- Bacteremia
- ARDS
- Endo/Pericarditis
- Empyema
- Lung Abscess
- Necrotizing PNA

Inpatient

- B-lactam + Macrolide
- B-lactam + Resp FQ
- Severe
- B-lactam + Macrolide
- Resp FQ

Pseudomonas risk factors: + Anti-Pseudomonal B-lactam

MRSA risk factors: + Vanc + Linezolid

Fig. 11 Micro, Risk Factor, Pathophysiology, complication, Diagnosis, treatment of Pneumonia

fever. If your symptoms are severe or if you have other conditions that make you more likely to have complications, your doctor may send you to the hospital. With any kind of pneumonia, recovery will take time. You're going to need lots of rest. You might need a week off your usual routines, and you could still feel tired for a month.

H. Herbal treatment of Pneumonia:

Following are the important plant / Herb used in the treatment of Pneumonia.

- 1) **Fenugreek:** Fenugreek (*Trigonella foenum graecum*) is an annual plant belongs to the family Leguminosae. It is the famous spices in human food. The seeds and green leaves of fenugreek are used in food as well as in medicinal application that is the old practice of human history. Fenugreek is used in the treatment of many diseases like fever, asthma, cough, congestion etc. This effective remedy is extensively used in India for mucous congestion. You can prepare fenugreek tea by boiling a teaspoon of fenugreek in 500ml water and then add a few drops of honey in it. It can give you great relief in pneumonia or any congestion problem. Also Read 5 early warning signs of pneumonia in elders. Fenugreek has mucolytic properties that relieve



Fig. 12 Fenugreek Seed for Pneumonia

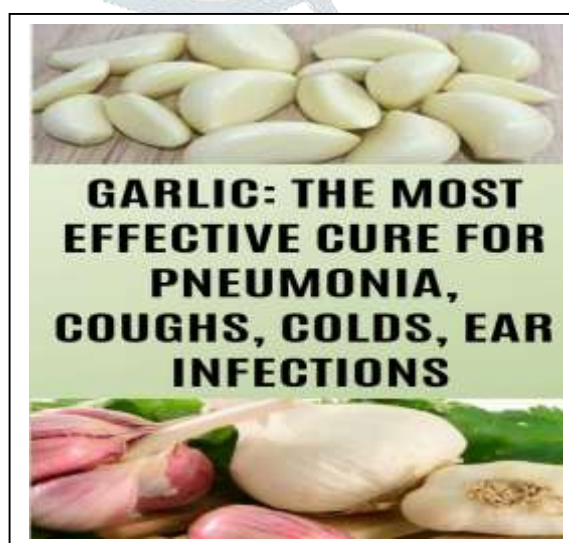


Fig. 13 Garlic used for Pneumonia

congestion. It causes sweating that removes toxins from the body and reduces fever. Prepare fenugreek tea by boiling some fenugreek seeds in two cups of water. Strain and drink it. You can even prepare a herbal tea comprising of fenugreek seeds, ginger, garlic cloves, and a pinch of cayenne pepper. Drink this tea a few times throughout the day to get relief from the symptoms of Pneumonia and various respiratory tract infections.

- 2) **Garlic:** Garlic or Lehsun consists of the fresh compound bulb of *Allium Sativum* Linn. Family Liliaceae. Garlic is considered to be hot in nature and is a home remedy for many health problems which are caused due to cold like a cough, asthma, pneumonia. You can either consume it in the morning or you can also apply garlic paste on the chest as it has the ability to fight against pneumonia and help in fast recovery from the disease. Its antimicrobial properties fight off viruses, bacteria and fungi. It reduces the body temperature and increases expectoration to clear the phlegm out of the chest and lungs. The antibacterial activity of the crude aqueous extract of garlic was investigated against some pneumonia causing bacteria by an agar dilution technique. The results revealed that *Streptococcus pneumoniae*

standard test organism was completely inhibited by 7.8 mg/ml of media and the clinical isolate of *Klebsiella pneumoniae* was completely inhibited by 24.38 mg/ml of media, indicating that *Streptococcus pneumoniae* is the most sensitive and *Klebsiella pneumoniae* the least. Garlic could be used as an effective antibacterial agent for these pathogenic microorganisms. Drink a boiled solution of milk, water and crushed garlic or consume a mix of lemon juice, honey and garlic thrice daily to cure the condition.

- 3) **Turmeric:** Turmeric is a flowering plant, *Curcuma longa* of the ginger family, Zingiberaceae. This natural agent has the property to provide relief from pneumonia. You can take one



Fig. 14 Turmeric for Pneumonia



Fig. 15 Chili for Pneumonia

teaspoon of turmeric powder with cow's milk every day for instant relief from pneumonia. This also works as a mucolytic to expel mucus from the respiratory tract. Its antiviral and antibacterial properties help in fighting infection. Turmeric tea help in case you are having chest pain due to pneumonia. Having anti-inflammatory properties, it can help you get rid of the inflammation. Notable, turmeric is associated with antioxidant and antimicrobial properties, that can be beneficial during pneumonia to fight against the microbes. To make turmeric tea, you need to add a teaspoon of turmeric in 3-4 cups of boiling water. Let the turmeric stay for 10 minutes and then strain the liquid. You can add a pinch of black pepper in the tea before having it.

- 4) **Dianthus:** Antibacterial properties Whole plant extracts of *Dianthus caryophyllus* show antibacterial activity against *Klebsiella pneumoniae*, *Bordetella bronchiseptica*, and *Staphylococcus epidermidis*. Two antibacterial compounds thymol and eugenol extracted from dried buds, show activity against Gram-negative bacteria. Eugenol was isolated from the essential oils of the plant and investigated for its antibacterial activities against seven selected pathogenic bacteria (*Staphylococcus aureus*, *Bacillus cereus*, *Listeria monocytogenes*, *Proteus mirabilis*, *Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*). Eugenol achieved strong Minimum Inhibitory Concentration values against most tested pathogens and the best MIC value was observed against *B. Cereus*, *L. monocytogenes* and *Klebsiella pneumoniae* whereas, *S. Aureus*, *P. mirabilis* and *E. coli* were inhibited. Whole *Dianthus*

caryophyllus extracts showed antibacterial activity against Staphylococcus Epidermidis, Klebsiella pneumonia and Bordetella bronchiseptica. Standard bacterial strains included Pseudomonas Aeruginosa, P. fluorescens, Bacillus subtilis, B. cereus and B. pumilis were used to evaluate the antibacterial activity of Dianthus Caryophyllus.

- 5) **Cayenne pepper.** Capsicum annuum small fruited pepper in the nightshade family Solanaceae. It's high in capsaicin content which stimulates the release of mucus from the respiratory passages. It clears out the mucus from the respiratory system. Cayenne pepper is a good source of beta carotene that leads to the healthy development of mucous membranes. Add a dash of cayenne pepper in water. Mix some lemon juice with it and drink it a few times in a day. You can also mix cayenne pepper in carrot juice. Both are beneficial for treating pneumonia.
- 6) **Holy Basil:** The compound like vitamin c camphene, Eugenol and cineole are the essential oil of Tulsi, cure the infection of Lungs. It also helps to cure tuberculosis due to its antibiotics properties. A decoction of the leaves with honey and ginger is an effective remedy for bronchitis, asthma, influenza, Pneumonia cough and common cold. Doctors believe that Ayurveda can provide a natural cure for viral infections. In fact, the traditional Ayurvedic Panchakarma retreat with its deeply nourishing, enriching, and purifying practice is considered one of the best treatments to treat viral infections. As the new strain of virus continued to spread overseas and fears gripped the world, it's important that all of us take precautions to protect ourselves from any viral infections.



Fig. 16 Tulsi for Pneumonia



Fig. 17 Herbal remedies for Pneumonia

I. Summary:

In summary, refining the definition, History, Various concept of Scientist, Prevention and management of pneumonia is a formidable task as multiple terms are used in multiple fields of medical practice and research. The dangers of poor classification of pneumonia are wide spread empiric antibiotic therapy and heterogeneous groups in research, which have a tendency to influence the construction of research questions and studies. As a result, these research questions and studies may not provide clear answers. In this literature we studies that various Herbs used in the prevention and treatment of Pneumonia. The Drugs which are commonly used in

our daily life viz Tilsi, Turmeric, Ginger, Garlic, Chili, Dianthus, Methi. These are the important value in the treatment of various communicable diseases viz Chronic Bronchitis, Influenza, asthma, Pneumonia. A decoction of the leaves of Tulsi with honey and ginger is an effective remedy for bronchitis, asthma, influenza, Pneumonia cough and common cold. Whole Dianthus caryophyllus extracts showed antibacterial activity against Staphylococcus Epidermidis, Klebsiella pneumonia and Bordetella bronchiseptica. You can take one teaspoon of turmeric powder with cow's milk every day for instant relief from pneumonia. Garlic is considered to be hot in nature and is a home remedy for many health problems which are caused due to cold like a cough, asthma, pneumonia.

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