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CHRONIC BRONCHITIS AND EMPHYSEMA - a patient's guide
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Overview

If your doctor has diagnosed either chronic bronchitis or emphysema, there is much that can be offered to help you. The aims of treatment are:

To reduce the symptoms that limit your activities,

To make your life more comfortable and enjoyable, and

To prolong your life.

This article will provide you with useful information, which will allow you to improve your breathing and allow you to understand your condition better.

Introduction:

Chronic bronchitis and emphysema are the most common long-term lung conditions which cause shortness of breath. Each condition can occur by itself, but most people have a mixture of the two problems. There may be an added "asthma" component, which simply means that some people have an improvement in lung function and therefore breathlessness with use of certain medications (relievers - see later).

Chronic bronchitis and emphysema usually occur in people who have smoked or who continue to smoke cigarettes. Once you stop smoking, the damage done to your lungs cannot be repaired, but your rate of loss of lung function usually returns to that of the normal population. A small proportion of people who develop emphysema do so as a result of an inherited condition called Alpha 1 anti-trypsin deficiency which makes them particularly susceptible to the adverse effects of smoking. If you have emphysema it is always worthwhile having this checked by way of a simple blood test.

To better understand what happens to the breathing tubes and the lungs of people with chronic bronchitis and emphysema, it is worthwhile knowing how lungs normally work.

How do our lungs work?

Each time air is drawn in through the nose and mouth, it enters the windpipe or trachea before flowing into the right and left main airways and then out through about 20-25 further divisions of the breathing tubes, until it enters the air sacs called alveoli.

It is within the air sacs that oxygen from the air is absorbed into very small blood vessels called capillaries before returning to the heart and being pumped out to the rest of the body. At the same time, a waste product called carbon dioxide is removed from the capillaries into the alveoli and is then breathed out.

How does emphysema happen?

Emphysema gradually develops in all people independent of whether or not they smoke. If you were to live until 110 years of age and not smoked, it is likely you would be breathless when walking around the house as a result of a loss of alveoli. About 1 in 4 people who smoke destroy their alveoli at a much more rapid rate. Those who are most susceptible to the bad effects of smoking will develop breathlessness in their 40s or 50s, whilst others may not develop the problem until their 70s. When sufficient air sacs have been destroyed, the airways which feed them become floppy and narrow, making it harder and harder to breath.

What happens in chronic bronchitis?

Bronchitis simply means inflammation within the bronchi or airways. Fit people with normal airways can develop an acute bronchitis, most usually as a result of a viral infection and people with asthma will also have inflammation within the airways. In acute bronchitis, the inflammation will resolve when the virus is no longer active and may recover more quickly if appropriate medication is used (antibiotics for bacterial infection and anti-inflammatory agents like prednisone for inflammation). In the majority of asthmatics, inflammation in the airways can be kept under control and may even effectively disappear with use of long-term inhaled steroid therapy.

The name chronic bronchitis infers that the inflammation cannot resolve despite appropriate treatment, although short courses of oral steroids and inhaled steroids may reduce the amount of inflammation and thus symptoms.

We usually make mucus in the airways to keep them moist, but if inflammation persists, the production of mucus becomes excessive. This leads to cough and sputum production. If inflammation persists within the airways (and which is more likely to happen if people continue to smoke), then after a period the inflamed airway will be replaced by fibrosis (scar tissue), which makes the breathing tubes narrower and also floppy. Both excessive mucus production and narrowed breathing tubes make it harder to breathe and shortness of breath results.

People who have chronic bronchitis and emphysema are at greater risk of developing acute episodes of bronchitis. These episodes often follow a viral infection, but as people with chronic bronchitis become more severely affected, they may arise without any trigger such as a cold or flu.

How do you know whether you have chronic bronchitis or emphysema?

If you smoke and have a mildly productive cough (of small amounts of mucus), then by definition you have an element of bronchitis. This will only be associated with breathlessness if the airways or bronchi have become narrowed, either as a result of a severe acute bronchitis or because the airways have narrowed over time as a result of chronic inflammation.

It is said that you need to have lost about half your lung function before you begin to develop symptoms of breathlessness. This may first become apparent when you are walking up hills or stairs, but of course in advanced cases, breathlessness can occur just with dressing or showering and when you have about 20% of your lung function remaining.

Despite narrowed airways, people with chronic bronchitis or emphysema are still able to draw sufficient air in to breathe. However on breathing out, the breathing tubes collapse earlier than usual which causes air to be trapped in the lungs and for the lungs to over inflate. This causes an uncomfortable sensation in the chest and contributes to the feeling of breathlessness. Certain breathing techniques, medications and even surgery can deflate the lungs to a degree, reducing the severity of the symptom, making people feel less uncomfortable.

No matter what the cause of breathlessness (chronic bronchitis, emphysema, bronchiectasis, heart failure), as it worsens, it often causes anxiety and a loss of self-confidence. Understandably, as a result people often get out less and have less social contact. Together with the physical disability this can lead to depression. It is therefore important to find out whether everything has been done to try and alleviate your symptoms and whether you have made the appropriate adjustments to your condition, and which in turn allows you to maintain as good a quality of life as possible. Certainly people who feel they have won better control over their symptoms tend to feel better and do better than those who don't try and find ways of better managing symptoms.

Adapting to any limitations and ensuring that other members of the family and friends understand your condition can do a lot to relieve anxiety and lift depression.

Other problems

People with chronic bronchitis and emphysema are at greater risk of developing other medical conditions such as coronary artery disease, pneumonia, stroke and even lung cancer. This is not made to make you feel like the situation is hopeless, but rather to point out that if other conditions exist, they also need to be optimally managed for you to gain better control of symptoms.

Investigations/Tests

1. Lung function tests

a. Peak Flow Meters

These provide a relatively crude measure of lung function, but are cheap and readily available. Some people with chronic bronchitis and emphysema find benefit in measuring their peak flow reading from time-to-time.

b. Spirometry

This offers a much more accurate measure of lung function and is an essential measurement in determining whether you have chronic bronchitis or emphysema, in monitoring your response to treatment, and in determining whether your lung function remains stable on medication.

c. Detailed Lung Function Tests

Detailed lung function tests are available in the Green Lane Hospital Respiratory Medicine Department and at the Mercy Physiology Laboratory. Your doctor may on occasion arrange for these, particularly if he/she is trying to more accurately evaluate the severity of your condition and to help exclude other conditions (such as heart failure or other lung conditions).

2. Chest x-ray

Everyone who is diagnosed with chronic bronchitis or emphysema should have a chest x-ray performed. This may support the diagnosis (it may show over inflation of the lungs) and helps to exclude other diagnoses such as lung cancer and heart failure.

3. Blood tests

Everyone with chronic bronchitis or emphysema should have an Alpha 1 anti-trypsin level performed. It is also worthwhile performing a blood count as anaemia can contribute to breathlessness. Conversely, people who are developing worse lung function may have falling oxygen levels which may lead to an increase in blood cells.

4. ECG

People with chronic bronchitis and emphysema are at increased risk of coronary artery disease and it is worthwhile ensuring that they have not had a previous heart attack, which may be causing weakness of the heart muscle, and thus contributing to breathlessness. Further, as the severity of chronic bronchitis and emphysema worsens, it is important to ensure that the right side of the heart is not under strain (which would be shown up on an ECG) and which may be an indication for oxygen therapy.

5. CT scan of the chest

This may be useful were a diagnosis of emphysema has been made and when you have smoked relatively few cigarettes. This would help exclude other lung conditions. It may also be worthwhile if abnormalities are disclosed on the chest x-ray which require further investigation. It may also be considered if you are being considered for lung volume reduction surgery.

6. Sputum culture

Some people who continue to have discoloured sputum despite antibiotics, or who have frequent episodes of bronchitis, need to have sputum cultured. Certain bacteria are frequently found in people with chronic bronchitis and are not necessarily causing problems, but merely reflecting the severity of bronchitis. Others may have unusual infections with for example fungi (aspergillus) or atypical TB organisms and which may require specific treatment.

7. Bronchoscopy

This investigation is usually not warranted, but if you should cough up blood, then a bronchoscopy may be indicated to exclude lung cancer.

Treatment

a. Smoke cessation

If you haven't already given up smoking, this is by far the most important and useful thing you can do. Smoke cessation gives medications a better chance to work and leads to an improvement in survival, no matter how severe your condition is. Smoke cessation is gaining increased recognition and hopefully funding in acknowledgment that it is an extremely important part of therapy.

In Auckland, a number of GPs have attended and run a smoke cessation programme, which was developed by the University of New South Wales. Other programmes exist including one run by the Adventist Hospital in Auckland.

b. Relievers/bronchodilator therapy

The most commonly used are called beta agonists (Ventolin, Bricanyl, Respolin, Airomir) which may help open up the airways a little leading to some deflation and to a reduction in breathlessness. Their effect tends to last from minutes to hours and if they benefit you, they can be taken 1-2 puffs 4 times a day or as required. They do not reduce decline in lung function if you continue to smoke and there is some flimsy evidence to suggest that you may develop tolerance to them over time if used in too high a dose.

Another type of reliever is the anticholinergic inhaler (Atrovent). If you find benefit from this medication, then you can use 2 puffs 3-4 times a day. There is no evidence that this reduces decline in lung function in smokers, but there is no evidence that tolerance develops.

If you find benefit from both beta agonist and anti-cholinergic therapy, then for ease of administration you may find it helpful to try Combivent 2 puffs 4 times a day, which is a combination of Ventolin and Atrovent.

Serevent or Formoterol are long-acting inhaled beta agonists the effect of which may last for 12-14 hours. They are available in inhaler form and are registered for use in asthma (free if asthmatics fulfil specific guidelines with permission from the Health Authority). They are not registered for use in chronic bronchitis or emphysema in New Zealand. If you would like to try these medications, then you would have to pay for them. The cost for a year's supply would be in the vicinity of $450-600.

Tiotropium is a long-acting anti-cholinergic inhaled therapy, which may last for upwards of 20 hours. It is undergoing final clinical trials internationally (which we have been involved in at Green Lane Hospital) but is not yet available in New Zealand.

The major benefit from long-acting inhaled bronchodilator/reliever medications, is that people often feel grateful that there is less need for them to reach for their Ventolin or short

acting beta agonist therapy and which leads to greater confidence and improvement in quality of life.

c) Inhaled steroids (Becotide/Becloforte/Flixotide/Pulmocort/Respocort)

Controversy still exists as to their exact place in the management of chronic bronchitis and emphysema. Clinical trials suggest there is no benefit if people continue to smoke. For those who have given up smoking, improvement in lung function can be shown for 3-6 months after starting therapy at reasonably high doses. There is no evidence to suggest any further benefit after this time, apart from a possible reduction in frequency of episodes of bronchitis in those people with severe chronic bronchitis/emphysema.

Presently in New Zealand, we spend up to $25 million a year on inhaled steroids in people with chronic bronchitis and emphysema and it is likely that a good deal of this money is wasted and could be better spent on therapies with greater efficacy.

My suggestion at this time would be to use upwards of 2000mg of inhaled Becloforte/Respocort or 1000mg Flixotide per day for 3-6 months. After this, it is unlikely you would be deriving any benefit (and you may start developing mild side effects) such that I would suggest reducing by 1 puff every 2 months and as long as there is no deterioration in your symptoms or lung function. You need to work closely with your doctor whilst doing this. You may reduce to a low dose or possibly stop therapy altogether.

d) Oral steroids

If you have just been diagnosed with chronic bronchitis or emphysema, then you should be offered 20mg of prednisone for 3 weeks. This will allow adequate time for you to gain all of the benefit from this therapy and to try and improve lung function and control over symptoms. Subsequently, you should not get trapped into continuing oral prednisone therapy, even if you felt that you have gained benefit. Some people may need to gradually withdraw prednisone subsequently by reducing by say 5mg every week or 2 until the course is finished. Others will be able to stop the 3-week course abruptly without any problems.

If you remain on oral prednisone, the short term benefits will be overtaken in a few months to a year by the adverse effects of oral steroid therapy (see section on oral steroids).

Treatment of episodes of acute bronchitis often requires prednisone therapy. Depending on the severity of the attack, either 20-40mg a day should be employed. If the attack is associated with "mucky" sputum, then an antibiotic should also be used.

e) Dopamine agonists

These are not registered for use in New Zealand and require further testing. They are presently undergoing extensive trials internationally as well as at Green Lane Hospital. Initial studies suggest they are useful in reducing mucus and cough and in improving breathlessness, and seem to work directly on the airways and possibly the breathing centre.

f) Phosphodiesterase inhibitors

Another new line of therapy which shows promise but is years away from being registered. We have been involved in studies on this compound at Green Lane Hospital and may be involved in further studies in 2000.

Miscellaneous treatments

a. Inhaled therapy

There are a number of inhalers available for administering your reliever/beta agonist treatments. For people with chronic bronchitis/emphysema, I would strongly suggest the use of metered dose inhalers (press and breathe devices) in association with a spacer. This ensures that you are getting the right dose of medication to your breathing tubes. It also means that you can use a large number of puffs (upwards of 10-20 puffs of Ventolin/Respolin/Atrovent via the spacer) every hour or two during flare ups of bronchitis. This is a much cheaper and effective way of administering these drugs than a nebuliser.

Nebulisers have become popular in the management of chronic bronchitis and emphysema. However, there is no extra benefit from using them over say 20 puffs of Ventolin via a metered dose inhaler delivered through a spacer device. As such, depositing 10 or 15 doses of Ventolin or Respolin or Bricanyl into the appropriate spacing device and subsequently inhaling it while breathing normally is as effective as a nebuliser at much less cost.

b. Rehabilitation

Rehabilitation courses now exist at Green Lane Hospital, North Shore Hospital, South Auckland Health and Mercy Hospital. Such courses are very effective and improve exercise capacity and thus quality of life in the majority of people over 6-8 weeks.

People with chronic bronchitis/emphysema benefit from strengthening their diaphragm, chest muscles, arms and of course legs. They also benefit from improving their cardiac fitness.

The rehabilitation programme at Green Lane Hospital has been carefully evaluated and shows: an improvement in quality of life and exercise capacity and a reduction in hospital admissions in those who complete the programme. There is no reason why improvements cannot be sustained by continuing the programme at home with distant supervision.

c. Oxygen therapy

International guidelines exist for the use of long-term oxygen therapy. Once oxygen levels get to below a certain level, particularly if associated with evidence of strain on the right side of the heart, then there is clear evidence that oxygen therapy is beneficial. To be useful it must be taken for at least 16 hours a day.

Portable oxygen cylinders are not funded in New Zealand. International guidelines, however, suggest that portable oxygen may be of use in those with reduced oxygen levels in the bloodstream during exercise and those who experience a reduction in breathlessness and an increased exercise capacity during oxygen therapy.

A trial is underway at Green Lane Hospital to evaluate portable oxygen and will conclude in October 2000. If this study confirms a positive effect, then portable oxygen may become more available. Until that time, those people wishing to consider a trial of portable oxygen need to buy/rent their own small oxygen cylinder (around $2,700) and learn to decant oxygen from larger oxygen cylinders. If a clear benefit can be shown from an outpatient assessment, then large oxygen cylinders will be supplied to allow decanting to the smaller unit.

d. Lung volume reduction surgery

Lung volume reduction surgery is not fully funded presently in New Zealand. We are developing a database of patients who might be amenable to surgery and are only offering it to those patients who might otherwise be considered for lung transplantation.

There is a small group of people with a particular pattern of emphysema on CT scan who derive definite benefit from this operation. Only about one person in 30 has this pattern and almost invariably gain benefit from the procedure.

Uncertainty exists internationally as to whether this improvement is maintained in the medium to long term. Until the results of two studies (one in the United States and one in England) are completed, there is little likelihood of this becoming fully funded in New Zealand.

In the meantime, the results from the selected group of patients at Green Lane Hospital, in association with the results of lung volume reduction surgery in Australia, will be analysed and if clear benefit is exhibited still a few years after the procedure, then there will be a strong case for this to be funded and performed more routinely at Green Lane Hospital.

e. Lung transplantation

This is available to only a very small group of people with emphysema. Only those under the age of 55 years, who have attended a rehabilitation programme, and given up smoking for at least 2 years, and who have no other contraindications to lung transplantation will be considered. Survival results of lung transplantation for emphysema reveal around 80% alive at 2 years and 55-60% at 5 years.

Miscellaneous

1. Flu vaccination

Flu vaccination has proven benefit for anyone with emphysema or chronic bronchitis, contributing to a 55% reduction in episodes of acute bronchitis.

2. Pneumococcal vaccine

There is less evidence to support Pneumococcal vaccine. However, if you have frequent infections, it should be considered.

3. Mucolytic agents

There is some evidence that mucolytic agents (agents which reduce the tenacity of sputum which allows it to be cleared more easily) are beneficial in chronic bronchitis. Combining the results of all trials available, there is a small but definite advantage from their use in people who produce a lot of mucus. Unfortunately these agents are not funded in New Zealand and you would have to pay for them.

4. Diet

It is important to maintain good nutrition. When the lungs begin to fail, you may begin to lose weight. This can be a protective mechanism, since becoming lighter means that the lungs and heart need to work less hard. However, if your weight reduces to below a certain level, your diaphragm and chest wall muscles may not work as well. Therefore, you may require supplemental foods such as Pulmocare, Ensure Plus or Fortisip, which can be prescribed by your doctor free of charge if they gain permission from the Health Authorities to prescribe them.

5. Antibiotics

As previously stated, antibiotics are of proven benefit when you have acute episodes of bronchitis associated with discoloured mucus. Some people who have frequent episodes of bronchitis may benefit from "prophylactic" antibiotics (i.e. taking antibiotics regularly).

6. Immunoglobulin therapy

A very small group of people have low immunoglobulin levels. In exceptional circumstances and when recurrent infections are common, immunoglobulin therapy may need to be administered 3-6 times weekly. This problem is seen more often in association with Alpha 1 anti-trypsin deficiency.

7. Chronic bronchitis/emphysema support group

The first support group in Auckland has been established at Green Lane Hospital (contact Pam Young, physiotherapist, Green Lane Hospital).

Summary

COPD is common and is almost always associated with smoking. It is the fourth most common cause of death in the Western World and the fourth most common cause of hospital admission. It continues to increase in prevalence and is expected to become the number one cause of death in the Western World.

As always, the best strategy is to stop smoking before too much damage has occurred.

If you smoke and have symptoms of cough and sputum production, or have become aware of breathlessness when climbing stairs or hills, then you must obtain a lung function test (the best screening test is spirometry). If you are defined as one of the 25% of people who

are disadvantaged in terms of reduced lung function, then it is imperative you stop smoking.

DEMENTIA - a patient's guide
Dr Geoff Green - Physician

What is it?

Dementia is defined as an acquired, usually persistent impairment of intellectual function, including memory problems and at least one of the following - language impairment, visuospatial (orientation) problems, difficulties with calculations, reasoning, and abstraction. Personality change may occur. Despite these impairments, the person remains fully alert. However, these intellectual losses are severe enough to interfere with work or social activities.

Dementia is a syndrome and as such does not refer to a specific disease. There are a large number of causes. The more important causes include:

Alzheimer's disease

Multiple strokes ("vascular dementia")

Alcohol

Head injuries

Brain tumours

Hydrocephalus (water on the brain)

Parkinson's disease (but not all patents with Parkinson's disease get dementia)

Infections such as meningitis, AIDS and certain viruses

Vitamin deficiencies (especially Vitamin B12)

Hormonal disturbance such as an under-active thyroid gland

*The first two causes account for the majority of cases.

Dementia becomes more common with age. Five percent of the population over 60 are said to have dementia, but this rises to 20% of the population over 80 years. It appears to affect all ethnic groups. It is a common cause of disability in the elderly, and is common in residents of rest homes and geriatric hospitals.

What are the symptoms?

The changes tend to be slowly progressive, and subtle at first. It is common to notice memory problems initially. However, this needs to be distinguished from mild memory loss that occurs with age and is not related to dementia. Often the changes are noticed first by family and friends, rather that the patient.

With time, the initial memory loss becomes more severe and obvious. Long term and short term memory becomes affected. Other intellectual functions become affected. The person may have difficulty in balancing their chequebook, difficulty counting change, may show poor judgement with purchases, and their self-hygiene may decline. A personality change may occur with the person becoming more slovenly, rude, and sometimes uninhibited. All these symptoms occur at different rates and to different degrees, depending on the underlying cause.

Dementia needs to be distinguished from:

Delirium, a temporary condition of brain dysfunction, associated with disturbed consciousness, which typically fluctuates. It is usually caused by some physical illness.

Depression

Strokes which may, for example, produce speech difficulties without dementia

Sensory impairment, such as severe deafness

It is important for people with suspected dementia to see a physician, so that the diagnosis can be confirmed, the cause can be determined, and so that treatment can begin.

What tests are needed?

Usually a clinical assessment is needed, a few blood tests and a brain scan. Sometimes neuropsychological tests, including various "puzzles" are performed to determine which part of the brain is most affected. Occasionally other tests such as analysis of spinal fluid and electroencephalograms (brain wave measurement) are required.

What can be done to help?

Treatment depends on the cause. In some circumstances, treatment of the underlying cause results in a considerable intellectual improvement. However, in the majority of cases, dementia is persistent and often gets worse (progressive).

It is important for sufferers of dementia to be well informed regarding their diagnosis and prognosis, so that they can anticipate the future. They require advice on wills, appointing Powers of Attorney, financial planning etc. It is important to provide support for their caregivers, such as relief care. Maintaining a familiar environment and routine is helpful and avoids episodes of acute confusion. Unnecessary medications should be withdrawn (under the supervision of a physician).

Specific remedies depend on the cause. In certain cases, drugs are beneficial. Depending on the cause, other interventions may help. For example, cessation of alcohol in alcoholics; surgery in hydrocephalus; control of blood pressure and aspirin in vascular dementia; certain drugs in Alzheimer's disease. Behavioural symptoms often respond to non-pharmacological interventions. Recognising patterns of behaviour, and avoiding precipitants of undesirable behaviour (which are often recognised in time), and behaviour management strategies are helpful.

Future trends

A vast amount of research is continuing into dementia. New discoveries are being made regularly. For example, new drugs have recently become available for the treatment of Alzheimer's Disease.

There is growing confidence that in the future, our ability to prevent and treat dementia will improve greatly.