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Cannabis compound 'halts cancer'

Last Updated: Monday, 19 November 2007

A compound found in cannabis may stop breast cancer spreading throughout the body, US scientists believe.

The California Pacific Medical Center Research Institute team are hopeful that cannabidiol or CBD could be a non-toxic alternative to chemotherapy.

Unlike cannabis, CBD does not have any psychoactive properties so its use would not violate laws, Molecular Cancer Therapeutics reports.

The authors stressed that they were not suggesting patients smoke marijuana.

They added that it would be highly unlikely that effective concentrations of CBD could be reached by smoking cannabis.

CBD works by blocking the activity of a gene called Id-1 which is believed to be responsible for the aggressive spread of cancer cells away from the original tumour site - a process called metastasis.

Past work has shown CBD can block aggressive human brain cancers.

The latest work found CBD appeared to have a similar effect on breast cancer cells in the lab.

Future hope

Lead researcher Dr Sean McAllister said: "Right now we have a limited range of options in treating aggressive forms of cancer.

"Those treatments, such as chemotherapy, can be effective but they can also be extremely toxic and difficult for patients.

"This compound offers the hope of a non-toxic therapy that could achieve the same results without any of the painful side effects."

Dr Joanna Owens of Cancer Research UK said: "This research is at a very early stage.

"The findings will need to be followed up with clinical trials in humans to see if the CBD is safe, and whether the beneficial effects can be replicated.



The CBD compound found in cannabis is non-toxic

“ This compound offers the hope of a non-toxic therapy that could achieve the same results without any of the painful side effects ”

Lead researcher Dr Sean McAllister

"Several cancer drugs based on plant chemicals are already used widely, such as vincristine - which is derived from a type of flower called Madagascar Periwinkle and is used to treat breast and lung cancer. It will be interesting to see whether CBD will join them."

Maria Leadbeater of Breast Cancer Care said: "Many people experience side-effects while having chemotherapy, such as nausea and an increased risk of infection, which can take both a physical and emotional toll.

"Any drug that has fewer side-effects will, of course, be of great interest."

But she added: "It is clear that much more research needs to be carried out."

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Too much cannabis 'worsens pain'

Last Updated: Wednesday, 24 October 2007

Smoking large amounts of cannabis for therapeutic reasons may increase rather than reduce pain, a US study suggests.

The pain-relieving qualities of cannabis have long been hailed, and several countries have made it available for medicinal purposes.

But quantity is key, according to the study in the journal *Anesthesiology*.

University of California researchers found moderate use had the greatest impact on pain in 15 volunteers, while large doses actually made pain worse.

The team recruited 15 healthy volunteers, in whom pain was induced by injecting capsaicin - the "hot" chemical found in chilli peppers - under their skin.

They were then given cannabis to smoke. The strength of the dose was determined by the tetrahydrocannabinol content, which is the main active chemical in cannabis.

Some of the volunteers were given a placebo.

High, but in pain



Canada and Holland allow the medical use of cannabis

Five minutes after smoking the drug, none of the doses had any effect on the pain felt.

But 45 minutes later, those who had smoked the moderate dose said their pain was much better, while those who consumed high doses said it had got worse.

They did, however, feel "higher" than counterparts who had taken moderate doses.

Dr Mark Wallace, the lead researcher, said the findings could have implications for the way medicinal cannabis was offered, both in pure and drug form.

Some experts are concerned that results on healthy volunteers could not be translated into how cannabis works in the bodies of those with cancer or multiple sclerosis, for whom the drug is increasingly seen as a potential form of pain relief.

Dr Laura Bell, of the MS Society, said: "Many people with MS report benefits to symptoms such as pain from taking cannabis, however studies to date on the effects of cannabis on pain are small and difficult to draw firm conclusions from.

"We would be interested to see the results from larger scale studies focused on people with MS."

Body's own pain relief 'is best'

Last Updated: Thursday, 27 July 2006

Doctors looking to harness the benefits of cannabis may do better to focus on boosting the body's own pain relief system, scientists suggest.

The human body has its own endocannabinoid system which helps regulate pain, hunger and anxiety.

Experts at the Federation of European Neuroscience Societies meeting in Vienna said using plant cannabinoids would mean less targeted therapies.

They said this meant it was harder to avoid unwanted side-effects.

Experts said this was because it was the drug affected many different areas in the brain, nerves and immune system.

Research was presented to the conference which showed that a cannabis-like chemical, could worsen symptoms in mice with an epilepsy-like condition.

However, doctors stress previous studies in animals and humans have shown that multiple sclerosis patients can benefit from cannabinoid medicines.

Professor David Baker, of the Institute of Neurology at University College London, who attended the meeting, said: "There is a benefit of moving from agents from illegal plant based medicines to looking at how we use pharmaceutical medications to target the benefits of cannabinoids, but reduce the well known adverse effects."

The only cannabis-based drug which can be currently be used in the UK is a treatment for MS called Sativex.

It has been granted a special licence meaning it can only be used if the doctor takes responsibility for prescribing it.

The drug, produced by GW Pharmaceuticals, is a mouth spray containing two chemicals found in cannabis, THC and cannabidiol.

It is made using plant cannabinoids.



Cannabis extracts are hard to target

Cannabis 'reduces surgery pain'

Last Updated: Friday, 2 June 2006

A cannabis plant extract provides pain relief for patients after major surgery, research has shown.



Cannabis drugs could help with pain after operations

An Imperial College London team tested the extract - Cannador - on 65 patients after surgery such as knee replacements and found it helped manage pain.

The researchers believe the results could lead to new pain relief drugs, even though the chance of side effects increased with stronger doses.

The research appears in the US journal Anesthesiology.

Lead researcher Dr Anita Holdcroft said: "Pain after surgery continues to be a problem because many of the commonly used drugs are either ineffective or have too many side effects.

"These results show that cannabinoids are effective and may lead to the development of a wider range of drugs to manage post-operative pain."

The researchers tested Cannador in different doses on 65 patients who had previously undergone surgery.

While all 11 patients who received a 5mg dose of the drug requested additional pain relief, only 15 of the 30 who received the 10mg dose and 6 of the 24 on the 15mg dose did so.

Side effects

However as the dose increased some patients reported increased side effects such as nausea and increased heart rate.

Professor Mervyn Maze from Imperial College London, who also worked on the study, said: "We thought cannabis might be beneficial in helping manage pain following surgery, as previous research indicated cannabinoids help 'top up' the body's natural system for reducing pain sensation.

"This research proves it can be effective, with minimal side effects at low doses."

GW Pharmaceuticals, a Salisbury-based firm, is developing cannabis-based medicines under licence from the UK government.

One of its products, Sativex, has already been licensed in Canada for pain control in people with multiple sclerosis, and trials of the drug's ability to provide pain relief for people with advanced cancer are continuing.

Mark Rogerson, a company spokesman, said: "This latest trial is another welcome contribution to the body of evidence that cannabinoids have a role to play in medicine."

“ This latest trial is another welcome contribution to the body of evidence that cannabinoids have a role to play in medicine

Mark Rogerson, GW Pharmaceuticals

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Brain 'cannabis' Parkinson's hope

Last Updated: Thursday, 8 February 2007

Boosting levels of the brain's natural cannabis-like chemicals could improve the treatment of Parkinson's disease, a US study suggests.

Mice with a similar condition could move normally within 15 minutes of having a cocktail including a compound which increases endocannabinoid levels.

But the scientists, writing in Nature, warned smoking cannabis would not have the same effect.

UK experts said the study increased understanding of Parkinson's.

Around one in 500 people in the UK have the disease.

It is a progressive, degenerative, neurological condition for which there is currently no cure.

Sufferers find increasing difficulty in moving their arms and legs. They develop tremors and facial tics, and gradually become more and more immobile.

Treatment combination

The researchers, from Stanford University Medical Center in California, focused on an area of the brain called the striatum which has already been linked to Parkinson's.

The activity of nerve cells in the striatum relies on the chemical dopamine.

“ It is a long, long way to go before this will be tested in humans

Dr Robert Malenka, Stanford University

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If there is too little dopamine in that area, Parkinson's disease can develop.

They used mice genetically modified to have a condition like Parkinson's and marked certain cells with a fluorescent protein that glowed vivid green under a microscope.

Their study indicated that two types of cells formed a "push-pull system" in the brain - one is thought to be involved in activating motion, while the other is likely to stop unwanted movement.

If there is too little dopamine, it is thought that the cells which restrict motion become dominant, making it harder for a person to move.

An existing drug which boosts dopamine levels led to a small improvement in the animals' condition.

But it was only when they added an experimental drug designed to slow the breakdown of endocannabinoids, being developed by Californian firm Kadmus Pharmaceuticals, that the mice showed a dramatic improvement.

The mice went from being unable to move, to moving freely in 15 minutes.

'Greater insight'

Dr Robert Malenka, who led the study, said: "They were basically normal.

"This points to a potentially new kind of therapy for Parkinson's disease."

But he added: "It is a long, long way to go before this will be tested in humans, but nonetheless, we have identified a new way of potentially manipulating the circuits that are malfunctioning in this disease."

And he stressed that the study found the use of specific chemicals made the difference.

"That is a really important difference, and it is why we think our manipulation of the chemicals is really different from smoking marijuana."

Kieran Breen, director of research and development at the UK's Parkinson's Disease Society, said: "The study provides us with a greater insight into how the nerve cells in the area of the brain affected in Parkinson's are connected and how they communicate with one another.

"A greater understanding of this will provide information about the changes that occur when nerve cells die and may ultimately lead to the identification of new targets in the cell at which drugs can act to treat the symptoms of the condition."

Bowel study backs cannabis drugs

Last Updated: Sunday, 31 July 2005

Patients with inflammatory bowel disease may benefit from cannabis-based drugs, UK scientists believe.

The Bath University team found people with the gut disorder had an abundant number of a type of cannabinoid receptors in their body.

They believe this is part of the body's attempt to dampen down the inflammation and that giving a drug that binds to these receptors could boost this.

Their findings appear in the journal *Gastroenterology*.

Cannabinoids

When people have Crohn's disease or ulcerative colitis - collectively known as inflammatory bowel disease or IBD - their immune system goes into overdrive, producing inflammation in different areas of the digestive tract.

This causes symptoms such as pain and urgent diarrhoea.

Anecdotally, people with IBD who have been users of cannabis have reported that their symptoms get better when they use the drug.

Dr Karen Wright and colleagues examined gut samples from healthy people and IBD patients and looked for the presence of two receptors known to react to natural cannabis-like compounds produced by the body.

Both the patients and the healthy people had similar numbers of CB1 receptors in their gut. However, the IBD patients had far greater numbers of CB2 receptors.



The compounds share some properties with cannabis

“ These initial results look extremely promising and exciting

”
Dr Derek Scott from Aberdeen University

The normal job of CB1 and CB2 receptors is to switch immune responses on or off. CB1 receptors also help to promote wound healing in the lining of the gut.

Potential therapy

Dr Wright said: "This gives us the first evidence that very selective cannabis-derived treatments may be useful as future therapeutic strategies in the treatment of Crohn's and ulcerative colitis.

"This is because some extracts from cannabis, known as cannabinoids, closely resemble molecules that occur naturally in our body, and by developing treatments that target this system, we can help the body recover from some of the effects of these diseases."

She said that the psychoactive effects and the legal implications associated with herbal cannabis use made it unsuitable as a treatment.

However, it might be possible to make a synthetic cannabis-like drug that has all of the therapeutic benefits and none of the other actions of cannabis.

"Targeting drug development to components of the in-built cannabinoid system could be the way forward," she said.

Dr Derek Scott, a researcher in Biomedical Sciences at Aberdeen University, said: "These initial results look extremely promising and exciting.

More trials

"However, further work is required so that we can better understand exactly how the signalling pathways controlled by cannabinoid receptors might be targeted in IBD patients, and whether there might be any side-effects."

Cannabis-based medicines are already used for multiple sclerosis in some countries.

Dr John Zycheck, from the Peninsula Medical School in Plymouth, which has been granted £2 million to study these drugs for MS, said: "There is no reason why clinical studies could not be undertaken at a fairly early stage because we are already testing cannabinoids for a variety of different conditions.

"Cannabinoids do have an effect on the gut. It slows gut transit. We see it in our MS patients."

He said more work was needed to check whether these drugs would reduce inflammation and to work out a dose that was strong enough but not toxic.

Dr George Kunos from the US National Institutes of Health said an alternative approach could involve testing compounds that amplify the action of the body's natural cannabinoids by blocking their normal destruction in the gut.

He said animal studies suggested compounds that block the enzyme fatty acid amidohydrolase (FAAH) do this.

Dr John Bennett, Chairman of Core, a national gut and liver disorders charity, said: "I would not want any patient to think that a cannabis-based treatment for IBD is around the corner. Much more work is needed."

[Current cannabis law](#)

Cannabis

Cannabis is a Class B drug.

The government reclassified cannabis from Class C to Class B in January 2009. The decision was part of the drug strategy: [Drugs: protecting families and communities \(new window\)](#).

Why Class B?

Classing cannabis in Class B reflects the fact that skunk, a much stronger version of the drug, now dominates in the UK. Skunk has swept many less potent forms of cannabis off the market, and now accounts for more than 80% of cannabis available on our streets, compared to just 30% in 2002.

The classification of cannabis means:

- the government will robustly enforce laws on cannabis supply and possession
- police and other agencies will work to shut down cannabis farms and arrest the organised criminals who run them
- the consideration of additional aggravating sentencing factors for those caught supplying

cannabis near schools

Current penalties related to cannabis

Penalties for supply, dealing, production and trafficking

The maximum penalty is 14 years imprisonment.

Penalties for possession

The maximum penalty is five years imprisonment.

Young people in possession of cannabis

A young person found to be in possession of cannabis will be arrested and taken to a police station where they can receive a reprimand, final warning or charge depending on the seriousness of the offence.

Following one reprimand, any further offence will lead to a final warning or charge. Any further offence following a warning will normally result in criminal charges. After a final warning, the young offender must be referred to a Youth Offending Team to arrange a rehabilitation programme.

This police enforcement is consistent with the structured framework for early juvenile offending established under the Crime and Disorder Act 1998.

Adults in possession of cannabis

Anyone caught in possession of cannabis could be arrested.

Alternatively, police may:

- issue a warning (primarily for first-time offenders)
- issue a penalty notice for disorder, with an on-the-spot fine of £80

Find out more

Learn more about cannabis penalties on the [Home Office drugs policy website \(new window\)](#).