OXYGEN KILLS CANCER

Doctors hail exciting new breakthrough

A NEW way of destroying cancer, radically increasing effectiveness of radiotherapy, was hailed yesterday as a "very exciting" breakthrough by scientists.

If the oxygen supply within a tumour is increased, cancerous cells become far more sensitive to treatment.

Experts hailed the discovery as ground-breaking and said it would allow drugs to "prime and soften up" potentially deadly tumours before they are targeted with intensive treatment.

Research was carried out on breast, head and neck cancers as well as carcinomas that line the surface of the skin and organs. But it is expected that it could be adapted for use in other cancers.

"We have discovered a new way of overcoming the major reason most cancers become resistant to treatment with radiation or chemotherapy," said Professor Gilles McKenna, director of the research institute.

"By increasing the oxygen levels within the tumour, we can make it much more sensitive to treatment, allowing us to incorporate new drugs into a patient's therapy before they are faced with the disease.

"The new approach offers the potential to make a substantial difference to the lives of people suffering from cancer."

"We believe this can make a massive difference to the treatment of cancer and the quality of life of cancer patients."

Professor McKenna said that the team's work had revealed the new method of making tumours more sensitive to chemotherapy drugs.

"We believe this could revolutionise the way we treat cancer in the future."

A NEW VICTIM EVERY TWO MINUTES

- CANCER TYPE: 200
cancers - each with different causes, symptoms and treatments. 293,000 new cases diagnosed each year in UK.

- MOST COMMON: Breast, lung, bowel and prostate cancers account for more than half of all new cancers. Every two minutes a victim diagnosed.

- DEATHS: Causes one in four UK deaths. Three-quarters in over 65s. In 2007, 155,000 died in UK. Death rate fell 10% in the last decade. One in five die from lung cancer.

- NEW FEAR: Increase in potentially avoidable cancers, malignant melanoma, uterine (womb) and kidney.

- CHEMOTHERAPY: Anti-cancer drugs to destroy cancer cells.

- RADIOTHERAPY: High energy X-rays to try to destroy tumour and cure cancer. Can also be given to help pain.

- CURE: If both given at same time treatment is called chemoradiation. It can cure some cancers and reduce chance of it coming back.

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The new treatment will be an effective in all radiotherapy-treated tumours, including those notoriously hard to treat such as pancreatic cancer.

Previously experts have tried to cut off the blood supply, fueling tumour growth to starve and kill it. But the new method improves the blood vessel network within the tumour, increasing the concentration of oxygen.

Instead of boosting a tumour's growth potential, it has the opposite effect and weakens the cancer from the inside, making it far more sensitive to harsh radiotherapy.

Survive

Usually cancer cells fight to survive, but the new treatment makes them weak and less resistant to treatment.

Cancers low in oxygen are three times more resistant to radiotherapy. So, by restoring oxygen levels to that of a normal cell, the tumours become three times more sensitive to treatment. And a better, more stable blood supply in the tumour enables improved delivery of chemotherapy drugs.

Professor Gilles McKenna, said: "We have discovered a new way of overcoming the major reason most cancers become resistant to treatment with radiation or chemotherapy."

"Early results from a trial in patients with advanced pancreatic cancer suggest that this method can greatly improve the outcome in this disease, which is very difficult to treat."

"Clinicians in Oxford are pressing on to expand their trials to include patients with lung, cervical and rectal cancer, and they hope to begin adding patients to new trials later this year."

"If successful, these methods could bring new hope to patients with some of the most difficult to treat cancers."

The research, published today in the journal Cancer Research, was carried out by scientists from the Cancer Research UK-MRC Gray Institute for Radiation Oncology & Biology at the University of Oxford. They treated mice with certain drugs that improved the stability of blood vessels in the tumours.

Professor Gilles McKenna, director of the institute, said: "We are very excited to have uncovered this brand new approach to cancer treatment - where the drugs prime the cancer cells for radiotherapy."

"Previous work by the researchers had shown that treatment with some of these systems of drugs could improve radiotherapy, but it was not understood how."

Potential

Dr Lesley Walker, Cancer Research UK's director of cancer information, said: "For a long time scientists have been looking for ways to boost the oxygen supply to tumours to improve response to treatment and make radiotherapy even more effective."

"We still need to do more work on this technique, but boosting the effects of radiotherapy and chemotherapy are very exciting developments that hold real potential for use in patients."

"There are more than 200 types of cancer with 263,400 new cases diagnosed each year in the UK and causing one-in-four of all deaths."

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