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Ultraviolet light could beat hospital TB

Installing ultraviolet lights in hospital wards and waiting rooms could stop tuberculosis spreading, a study shows.

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Ultraviolet light could help beat TB on wards in hospitals, say scientists. Photo: MARTIN POPE

The rays damage the bacteria's DNA so they cannot infect people, grow or divide and are already used in ambulances and operating theatres as a disinfectant.

Researchers found 35 per cent of guinea pigs given air straight from a ward of 69 TB patients became infected themselves - compared to 9.5 per cent of animals that breathed in the same oxygen that was first exposed to UV radiation.

They say TB bacteria - including drug-resistant strains - can be killed by hanging a shielded UV light from the ceiling with a fan to mix the air.

Dr Rod Escombe, of Imperial College London, said: "When people are crowded together in a hospital waiting room, it may take just one cough to infect several vulnerable patients.

"Our previous research showed that opening windows in a room is a simple way to reduce the risk of tuberculosis transmission, but this is climate-dependent - you can't open the windows in the intensive care ward of a Siberian hospital for example."

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UV Light Cuts TB Spread

LONDON, March 17, 2009 - Installing simple ultraviolet C (UVC) lights in hospitals could help reduce the transmission of tuberculosis (TB), including the drug-resistant strains.

According to a new study by researchers at the Imperial College London; the University of Leeds; Hospital Nacional Dos de Mayo, Lima, Peru and other international institutions UV lights could cut the spread by 70 percent.

Every year, over nine million people are infected with tuberculosis and nearly two million people die from the disease, according to the World Health Organization. Infection rates are particularly high in places where vulnerable people are crowded together, such as hospitals, homeless shelters and prisons.

When a tuberculosis patient coughs, bacteria are sprayed into the air in tiny droplets, floating around the room and infecting other patients, visitors and healthcare staff. These bacteria can be killed by hanging a shielded UVC light from the ceiling with a fan to mix the air, say the researchers.

UVC light kills tuberculosis bacteria, including drug-resistant strains, by damaging their DNA so they cannot infect people, grow or divide. It is already used at high intensity to disinfect empty ambulances and operating theatres.

"When people are crowded together in a hospital waiting room, it may take just one cough to infect several vulnerable patients," said Rod Escombe, the study's principal investigator from the Wellcome Trust Centre for Clinical Tropical Medicine at Imperial College London. "Our previous research showed that opening windows in a room is a simple way to reduce the risk of tuberculosis transmission, but this is climate-dependent - you can't open the windows in the intensive care ward of a Siberian hospital for example."

"Thankfully, the rate of tuberculosis infection in countries like the UK is relatively low and people who are infected can be treated using antibiotics, which are readily available here. People are more likely to die from the disease in developing countries like Peru, because there are limited resources for isolating patients, diagnosing them quickly and starting effective treatment," added Escombe. "Also, the prevalence of drug-resistant TB is much higher in the developing world. Preventing infection is much easier and cheaper than treating a patient with tuberculosis."

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Mike Waites
Health Correspondent

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tuberculosis and about two million die from the disease.

Infection rates are particularly high in places where vulnerable people are crowded together, such as hospitals, homeless shelters and prisons.

The illness is spread when a patient coughs and sprays bacteria into the air in tiny droplets.

But the bacteria can be killed by hanging a shielded UVC light from the ceiling and by putting in place an effective system to move and mix the air, say experts from Leeds, London and Lima in Peru. UVC light kills tuberculosis bacteria, including drug-resistant strains, by damaging their DNA so they cannot infect people, grow or divide. It is already used at high intensity to disinfect empty ambulances and operating theatres.

Cath Noakes, of the faculty of engineering in Leeds, said the impact of the lights was greatest when combined with careful management of air flow on wards. "The lights must be set high enough to ensure patients and health workers are not over-exposed, but if the lights only treat air at that level there will be little benefit," she said.

"To be most effective, ventilation systems need to create a constant flow of treated air down to patient level, and potentially infected air up towards the lights."

Lead researcher Rod Escombe, from the Wellcome Trust Centre for Clinical Tropical Medicine at Imperial College, London, said: "Thankfully, the rate of tuberculosis infection in countries like the UK is relatively low and people who are infected can be treated using antibiotics, which are readily available here.

"People are more likely to die from the disease in developing countries like Peru because there are limited resources for isolating patients, diagnosing them quickly and starting effective treatment. Preventing infection is much easier and cheaper than treating a patient with tuberculosis."

The research is published in the *Public Library of Science Medicine*.

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150: the first group received air exposed to the UV lights in the ward, the second group received ward air treated with negative ionisers, and the third control group was given untreated air straight from the ward. The guinea pigs were given skin tests for tuberculosis once a month.

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