

# SCIENCE

## ScienceTalk

# Is tuberculosis still a problem in S'pore?

## While the incidence rate is low, there are some older folk here with latent infection

Every year, World Tuberculosis Day falls on March 24.

The day is commemorated to raise public awareness about the health, social and economic consequences of tuberculosis (TB), and to step up efforts to end the global TB epidemic.

The World Health Organisation estimates that 9.9 million people worldwide developed the disease in 2020, with 1.5 million deaths globally.

Over the past 16 years, the TB incidence rate in Singapore has remained between 30 and 40 per 100,000 people.

Given that TB was prevalent in Singapore before the 1960s – an immunisation programme for newborn babies was started in the mid-1950s – there is still a sizeable number of older people in Singapore with latent TB infection.

This means that while the bacterium is present in their bodies, they do not show any symptoms and are not infectious as the bacterium is suppressed by the immune system.

These patients can potentially develop active TB disease – where symptoms start to show and the patient becomes infectious – when their immunity wanes, posing a risk of transmission in the community.

Ahead of World Tuberculosis Day on Thursday, Dr Tay Jun Yang, associate consultant at the National Centre for Infectious Diseases (NCID), answers some common questions about the disease.

**Q How does TB spread, and are family members in the same household at higher risk of contracting TB?**

**A** TB is a disease that primarily affects the lungs. It spreads through close and prolonged contact with a person who has infectious TB.

TB affecting the lungs (pulmonary) or voice box (larynx) is infectious and it can spread when the infected person coughs, sneezes or speaks.

Hence, people living in the same household, or those who are in frequent, close contact with the affected person, are at higher risk of being exposed to TB and getting infected.

Children below the age of five and people with weakened immune systems are also at increased risk of developing TB.

**Q What precautions should I take to minimise the risk to family members?**

**A** People diagnosed with infectious TB should immediately start treatment, which usually involves a combination of several antibiotics, and be put on medical leave for the first two weeks.

While they will become non-infectious after two weeks of treatment, they will still need to complete a minimum six-month course of treatment. During this time, those on treatment do not pose a risk to their family members or other people.

However, during the first two weeks of treatment, they should stay at home except when attending directly observed therapy treat-

ment at the Tuberculosis Control Unit in Moulmein Road or a polyclinic. This treatment requires patients to take their medications under the observation of a healthcare worker.

They should also wear a mask in the presence of other people during the first two weeks of treatment and practise good cough etiquette, such as covering their mouth with a tissue when they cough or sneeze if unmasked.

**Q Where do I go if I want to be screened for TB? What is the TB screening process?**

**A** People who have been exposed to a person with infectious TB may be called by the NCID to undergo contact screening at the Tuberculosis Control Unit. During screening, they will undergo blood tests and possibly a chest X-ray to determine if they have been exposed to TB.

If diagnosed with active TB disease, they will promptly be started on the appropriate treatment.

If there is evidence of exposure to the TB bacteria but no active disease is detected, also termed latent TB infection, patients will be given a course of preventive therapy to prevent them from developing active TB disease in future.

**Q What symptoms should I look out for?**

**A** Symptoms of TB include pro-

longed cough (defined as coughing for three weeks or more), coughing blood, weight loss, night sweats and persistent fever.

Individuals who are unwell and display these symptoms should seek medical attention early to ensure prompt diagnosis and treatment.

**Q Can TB be cured?**

**A** TB is curable. Following TB screening, an outcome from the TB test will determine the course of treatment.

If the test is positive, the doctor will then determine if the person has active TB disease or latent TB infection.

A person with active TB in the lungs or voice box may be infectious and may exhibit specific TB symptoms. If diagnosed with active TB disease, the person should be treated immediately and will need to take at least six months of medications under the direct supervision of a healthcare professional.

TB is curable and more than 95 per cent of people with drug-sensitive TB, which means that the TB bacteria are not resistant to any of the drugs targeted to kill them, are cured as long as they adhere to the prescribed treatment.

Otherwise, TB may recur or become resistant to first-line anti-TB drugs.

A person with latent TB infection does not develop symptoms and does not spread TB to others, but the TB bacteria remain in the body.

If diagnosed with latent TB infection, one can be started on a course



ENSURING PROPER RECOVERY

The full course of treatment for drug-sensitive TB typically requires patients to take several medications for six to nine months. Adherence to treatment and medical appointments is important to ensure proper recovery and to prevent the spread of TB in the community. Poor adherence to medication can lead to drug-resistant forms of TB, which take longer and are harder to treat.



**DR TAY JUN YANG** (above), associate consultant at the National Centre for Infectious Diseases.

of preventive treatment to prevent the development of active TB disease in future.

**Q How is TB treatment carried out? Do I really need to go to the clinic and be observed taking my medication every day?**

**A** The full course of treatment for drug-sensitive TB typically requires patients to take several medications for six to nine months.

Adherence to treatment and medical appointments is important to ensure proper recovery and to prevent the spread of TB in the community.

Poor adherence to medication can lead to drug-resistant forms of TB, which take longer and are harder to treat.

Directly observed therapy is currently the best way of ensuring patients' response and adherence to treatment for their personal health and that of others around them. An outreach programme is available for patients who are unable to visit the clinics for their treatment due to age or infirmity.

**Q Why am I not protected even though I was given the BCG vaccination as a baby?**

**A** The Bacillus Calmette-Guerin (BCG) vaccine is administered to all children at birth and protects babies and young children against other serious forms of TB, such as TB meningitis, which affects the brain lining, and disseminated TB, where the bacteria have spread to multiple organs within the individual.

However, it offers limited protection against pulmonary TB, which refers to TB in the lungs. This is the most common form of TB disease among adults.

Hence, people may not be protected from developing pulmonary TB even though they have undergone the BCG vaccination.

**Q How affordable is TB treatment, and are there any subsidies provided?**

**A** TB treatment is heavily subsidised for Singaporeans and permanent residents. Additional charges would apply for non-basic tests.

**Q How should someone with TB take better care? Are there any specific areas the person should look out for?**

**A** People diagnosed with TB should adhere strictly to the medication regime.

They should ensure that they take all their medications for the full prescribed period on a regular basis, and make sure they do not skip doses or stop taking the medications early, even if the symptoms go away and they start to feel better.

This ensures that the TB bacteria are successfully eliminated. A healthcare professional will advise them on the side effects to look out for and what they should do if they develop side effects after taking the medication.

If you are caring for someone with TB, give your full support and encourage the person to take the medications.



The National Centre for Infectious Diseases has a gallery where current infectious diseases such as HIV and tuberculosis are highlighted. World Tuberculosis Day falls on March 24, and the World Health Organisation estimates that 9.9 million people worldwide developed the disease in 2020, with 1.5 million deaths globally. ST PHOTO: LIM YAOHUI

## S'pore-based biotech firm starts clinical trials for oral cancer drug

Kolette Lim

A biotechnology company based in Singapore has started clinical trials for a new oral cancer drug which it said could lead to cheaper and more targeted treatment of the disease.

AUM Biosciences hopes its treatment option would also allow for malignancies, which cannot be completely eradicated, to be managed like other chronic ailments, with pills taken on a regular basis.

The firm said traditional cancer treatments such as chemotherapy

are unable to differentiate normal cells and cancer cells, but targeted drugs can engage cancer cells specifically.

"The prior approach was akin to throwing spaghetti at the wall, hope something stuck, and calling that our solution to that cancer."

"The current paradigm is to understand the biology of the cancer, which means we are slicing and dicing cancer into a thousand-plus orphan indications," said Dr Harish Dave, chief medical officer and co-founder of AUM Biosciences.

The firm said this small-molecule targeted cancer therapy approach could lead to fewer nega-

tive side effects, such as fatigue and anaemia, or low red blood cell count.

Mr Vishal Doshi, its chief executive, said the firm decided on oral medication as it will allow patients to pause consumption for a short time whenever there are significant negative effects.

This would likely result in increased patient compliance for treatment, he added. "For example, Covid-19 vaccination is done through vaccination and people do feel a bit scared. With oral medication, the patient's journey becomes easier," said Mr Doshi, who is also a registered pharmacist.

The company acquires drugs from biotech companies or research institutes such as the Agency for Science, Technology and Research (A\*Star) and develops them into cancer medication that is safe to be commercialised.

AUM Biosciences said Singapore has only two oncology drugs in the pipeline – ETC159 and ETC206, which the firm successfully acquired in 2018 and is now developing as a small-molecule oral cancer drug.

Cancer is the leading cause of death in Singapore, with 16 people dying each day from the disease. In 2019, the country spent \$375 million on cancer drugs, a quarter of the Republic's drug spending.

Aside from potentially having fewer side effects, Mr Doshi said, small-molecule cancer drugs could be developed for less money than common treatments for cancer.

This would translate into lower

treatment costs for patients.

Last October, the company raised \$36.8 million in seed funding.

AUM Biosciences has started clinical trials for different oral drugs to treat colorectal cancer, the most common cancer among men, and breast cancer.

The company said it is expecting breakthroughs and announcements in the next few months.

The pills can be taken as a stand-alone treatment or alongside other treatment options, such as chemotherapy, said Mr Doshi.

"If we could make a difference in these cancers, we could help patients live longer," he said.

Professor Lee Soo Chin, head and senior consultant of the department of haematology-oncology at the National University Cancer Institute, said that small-molecule targeted cancer drugs have been in the market for 15 to 20 years.

These drugs target different types of cancers specifically, she added.

"The advantage of targeted therapy compared with conventional chemotherapy is that it is more specific against cancer cells and generally has fewer side effects than conventional chemotherapy that causes more side effects on normal cells," said Prof Lee.

Dr Polly Chen, a principal investigator at the Cancer Science Institute of Singapore, said most small-molecule targeted cancer drugs are orally administered.

Dr Chen, who is also an associate professor of the department of anatomy at the Yong Loo Lin School of Medicine, said: "The oral route is convenient, non-invasive and pain-free; the lives of busier Singaporeans will be minimally affected."

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