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STROKE remains one of Malaysia's most pressing health challenges, consistently ranking among the country's top causes of death.

Aside from the fatality rate, stroke often leaves survivors with lifelong disabilities, affecting not only individuals, but entire families.

In response, the Acute Networks Striving for Excellence in Stroke (Angels) initiative aims to help strengthen stroke care nationwide.

Launched in 2016 by German multinational pharmaceutical company Boehringer Ingelheim and endorsed by the European Stroke Organisation (ESO) and the World Stroke Organisation (WSO), the Angels initiative helps hospitals worldwide become "stroke-ready".

Its goal is straightforward: to improve stroke treatment by providing hospitals with the tools, resources and support necessary to ensure timely, effective care.

By enhancing hospital preparedness and increasing stroke awareness, the initiative helps healthcare teams deliver faster and more effective treatment.

For Sarawak General Hospital (SGH) consultant neurologist and stroke care leader Dr Law Wan Chung, the initiative arrived at a critical time.

"Stroke has consistently been among the top three causes of death in Malaysia over the past 10 to 15 years," he explains.

"The Angels initiative is very timely for Malaysia, as we urgently need to reduce both mortality and morbidity related to stroke."

Every minute matters

There are two main types of strokes: ischaemic, caused by a blood clot blocking a vessel in the brain, and haemorrhagic, caused by ruptured blood vessels that result in bleeding.

The most common type of stroke in Malaysia is ischaemic.

"Without oxygen-rich blood, brain cells begin to die within minutes," Dr Law explains.

"One minute lost means 1.9 million nerve cells are lost."

"Every 15-minute delay significantly reduces the chance of patient recovery."

He adds: "Treatment must be delivered within four-and-a-half hours of symptom onset."

"This means patients need to reach the hospital within that window, undergo examination, and most importantly, receive brain imaging to determine whether they are eligible for treatment."

Yet, many patients arrive too late. Data from the National Stroke Registry shows that only about 35% reach the hospital within that window.

"On average, patients take around seven hours to seek medical care – far beyond the ideal time frame," Dr Law notes.

If patients arrive early and meet the criteria, doctors will administer intravenous clot-dissolving medication to break down the blockage and restore blood flow.

However, for patients with large vessel occlusion, where a major artery is blocked, medication alone may not be sufficient.

In such cases, a wire may be inserted through a procedure

Saving time, saving brains



In East Malaysia, geography is often an impediment to getting stroke patients treated quickly, with some needing to be flown to hospitals that have stroke care units. Photos: Filepic

called mechanical thrombectomy – a minimally-invasive method to physically remove the clot.

Together, these are the most effective treatments for ischaemic stroke patients, and form the core focus of the Angels initiative in Malaysia and globally.

Becoming stroke-ready

Before participating hospitals are chosen for the Angels initiative, they must first meet essential criteria.

This includes having a specialist doctor trained in stroke care and access to neuroimaging facilities such as a CT (computed tomography) scanner or MRI (magnetic resonance imaging).

Once identified, hospitals receive on-site training from the Angels team to establish clear workflows and treatment criteria.

This starts from public awareness and extends to emergency medical services (EMS), i.e. ambulance services.

EMS personnel are trained to recognise stroke symptoms, prioritise patients within the treatment window and alert hospitals in advance.

Upon arrival, whether by ambulance or walk-in, the emergency department rapidly

assesses patients and sends them for urgent brain imaging in radiology before a neurologist's evaluation.

Public awareness also plays a crucial role.

Healthcare providers promote the BE FAST mnemonic to help people recognise warning signs:

- > B: Balance problems
- > E: Eye or vision disturbance
- > F: Facial drooping
- > A: Arm or leg weakness
- > S: Speech difficulties (slurred or confused speech)
- > T: Time, emphasising the urgency of seeking medical help.

"Even one sudden symptom is enough to go to hospital," Dr Law stresses.

Specific targets

Performance is closely monitored by the Angels team.

Stroke centres are graded gold, platinum or diamond based on key indicators.

These include the total number of stroke patients seen, the minimum number of patients treated over a given period, and the percentage of patients who receive clot-busting treatment.

One critical benchmark is door-to-needle time – i.e. the interval between hospital arrival and treatment – with an international target of 60 minutes.

"At SGH, our initial door-to-needle time was nearly two hours," Dr Law says.

"Through systematic auditing, we reduced it to under 60 minutes."

Another key measure tracks the proportion of eligible patients who receive treatment, ensuring that no suitable patient is missed.

Dr Law stresses that leadership is equally vital and that having a dedicated "stroke champion" to coordinate teams and drive improvement is essential.

With only around 170 practising neurologists nationwide and most large hospitals having only one or two, 24-hour coverage remains challenging.

"We cannot rely only on neurologists," he says.

"This role may also be taken on by physicians, geriatricians or emergency specialists, depending on the hospital's resources."

"Everyone must work in sync." Currently, SGH has earned 10 Gold Awards for hospital performance and one Diamond Award for ambulance performance.

The awards are assessed every three months, requiring hospitals to consistently maintain performance standards.

Beyond individual hospitals, Kuching has been recognised this year by the WSO as an Angels Region – a designation awarded to areas where community awareness, EMS partnerships and acute hospital care are optimised to deliver better outcomes for stroke patients.

Achieving this requires hospital, emergency services, local authorities and public educators to work in concert to provide safe, coordinated care for stroke patients in their communities.

Other areas in Malaysia that have received this recognition include the Barat Daya district in Penang and Taiping in Perak.

Introducing a common framework

When Angels was first introduced in Malaysia, stroke services were limited.

In 2017, only about 34 hospitals provided organised stroke-ready treatment, often on a case-by-case basis.

In fact, SGH had already begun 24/7 hyper-acute stroke care as early as 2015, becoming the first hospital in Malaysia to do so.

"The early years were

Promoting public awareness of stroke and the importance of seeking treatment quickly is one of the requirements of the Angels initiative.

challenging," Dr Law recalls.

"There was no established system."

"Everything had to be built from scratch."

Over time, workflows were refined and systems strengthened.

"We could see that the model worked."

In 2017, when the Angels initiative was introduced, SGH was the first in East Malaysia to participate and adopt the international protocols and guidelines.

"It allowed us to monitor, audit and expand services – first across the state, and later, nationwide," he says.

Rather than operating independently, hospitals collaborated towards shared targets, fostering collaboration and replacing fragmented efforts with a coordinated, standardised approach.

Today, 47 hospitals under the Health Ministry, six under the Higher Education Ministry and 48 private hospitals nationwide provide hyper-acute stroke services.

In East Malaysia, 22 hospitals participate in the initiative, including 12 in Sarawak.

Reaching rural communities

For patients living near urban centres, access to stroke care is relatively straightforward.

In rural Sarawak, however, geography poses significant challenges.

To address this, an integrated ambulance network was established.

"Patients in smaller district hospitals within the Kuching region – including Bau, Serian and Lundu – can be rapidly transferred," Dr Law explains.

These cluster hospitals lack neuroimaging equipment, requiring transfer to SGH for such facilities.

"If patients present within the treatment window, ambulances may bypass nearer facilities and transport them directly to SGH to have everything done here, including imaging and treatment," he says.

Today, most Sarawak hospitals with specialist support and neuroimaging provide hyper-acute stroke care, forming referral networks with smaller facilities.

Mechanical thrombectomy, however, remains limited. SGH is currently the centre in Sarawak offering the procedure.

For smaller district hospitals outside Kuching, treatment still relies heavily on medication to dissolve clots.

"Patients from other districts may require air transfer."

"Unlike in Peninsular Malaysia, where ambulances can transport patients over long distances by road, Sarawak's geography presents challenges, as the state is much larger," he says.

"Ideally, patients should reach Kuching within six hours, although it may still be considered up to 24 hours after symptom onset."

"Upon arrival, doctors reassess whether brain tissue remains viable before proceeding."

Dr Law emphasises that the most important message the public needs to understand is that stroke is treatable, and in many cases, reversible.

"The earlier treatment is given, the better the chances of full recovery."



KNOW YOUR MEDICINES

By HOR CHEAH YEN

BREASTFEEDING has long been widely recognised as the optimal source of nutrition for infants, as it provides numerous health benefits for them.

Since 1981, the World Health Organization (WHO) has recommended exclusive breastfeeding for the first six months of an infant's life, followed by continued breastfeeding alongside complementary foods for up to two years of age or beyond. Nevertheless, many mothers express concerns about the safety of taking medicines during breastfeeding, with the key one being: Do all medicines pass into breast milk?

Depends on the drug

Although in theory, most medicines are transferred into breast milk to some extent, the majority of commonly-used medicines by breastfeeding women can be taken safely.

This is as the amount of medicine present in breast milk is usually small and unlikely to cause harm to the infant.

In addition, breastfeeding women generally try to avoid taking medicines whenever possible and use them only when necessary.

Nevertheless, exceptions apply to certain medicines that may be present in high concentrations in breast milk or may exert harmful effects even at low concentrations.

Therefore, each medicine must be evaluated on an individual basis.

The amount of a medicine that passes into breast milk depends on its pharmacokinetic properties.

These include the molecular size of the medicine, the proportion of the drug that remains unbound in the bloodstream, and the duration for which the drug stays in the circulation.

When an infant is exposed to a medicine through breast milk, several factors determine whether side effects may occur.

These include:

- > **Timing of the dose** – feeding before mother takes the medicine results in the lowest possible drug exposure
- > **Volume of breast milk consumed** – a lower intake is associated with a reduced risk of side effects
- > **Age of the infant** – the younger the baby, the more underdeveloped their main organ functions are likely to be, which could affect how much of the medicine is absorbed, distributed or excreted.

Safe to use

There are times when breastfeeding women may need to take medicines to treat short-term illnesses or long-term chronic conditions.

Examples of medicines that are generally considered safe for use during breastfeeding include:

- > **Pain relievers**
These medicines are generally recommended for short-term use and only when necessary. Examples are paracetamol,

Can I take medicines while breastfeeding?

Mothers who are providing breast milk to their baby are usually concerned if any drugs they take could affect the young one.



The worry with breastfeeding mothers taking medicines is that the drug may enter the breast milk and adversely affect baby. — dpa



One option if a lactating mother has to take a short course of drugs that may have an effect on her baby, is to express breast milk before starting the medicines to ensure a continuing supply of milk. — TNS

mefenamic acid and ibuprofen.

> Antimicrobial medicines

These can be safely used to treat infections when taken at standard therapeutic doses.

Examples are amoxicillin, ampicillin, cloxacillin, cefuroxime, cephalixin and erythromycin.

> Antihistamines

These can be safely used to treat rhinitis or allergic reactions.

Examples are chlorpheniramine, loratadine and fexofenadine.

However, some antihistamines, particularly first-generation medications, may cause drowsiness, and should therefore be used with greater caution.

> Contraceptive medicines

Those safe to use are medicines that contain only progestin as the active ingredient.

> **Medicines for postpartum depression or anxiety**

Examples are paroxetine, sertraline and fluvoxamine.

> Epilepsy medicines

Examples are lamotrigine and carbamazepine.

> Fibre-based laxatives

These are preferred if needed during breastfeeding as other types of laxatives may cause diarrhoea in baby if taken in high doses by mother.

> Vitamin and mineral supplements

Examples are iron and vitamin B.

Be cautious

While most over-the-counter and commonly prescribed medicines are safe to use during breastfeeding, lactating mothers should still exercise caution when taking certain medicines.

For example, decongestant medicines that contain ingredients such as pseudoephedrine or phenylephrine, which are commonly used to relieve nasal congestion associated with colds, flu or allergic rhinitis.

These medicines may reduce breast milk supply.

As a safer option, breastfeeding mothers may consider using saline nasal drops, nasal sprays or a humidifier to help relieve nasal congestion instead.

There are other medicines also known to reduce or suppress breast milk production.

These include ergometrine, diuretics such as hydrochlorothiazide, and oestrogen-containing oral contraceptive pills.

Mothers are advised to consult their doctor or pharmacist for further information and appropriate alternatives.

For mothers with diabetes, medicines from the sulphonylurea group, such as gliclazide, should be avoided or used with caution during breastfeeding due to the risk of hypoglycaemia (low blood sugar) in the infant.

Certain antibiotics, such as chloramphenicol, tetracycline, metronidazole and quinolone antibiotics, should be avoided during breastfeeding or used only under strict medical supervision.

These medicines can pass into breast milk and may cause side effects, such as gastrointestinal disturbances or diarrhoea, in the infant.

Cancer treatments such as chemotherapy medicines, including metabolites, as well as radioactive medicines, should be avoided during breastfeeding because these substances can pass into breast milk and pose significant risks to the infant.

Medicines from the benzodiazepine group, which are commonly used to treat anxiety and insomnia, as well as opioid medicines prescribed for chronic pain may cause sedation and respiratory depression in the infant.

Advice for the public

Most medicines can still be safely used during breastfeeding, provided that those chosen are compatible with breastfeeding or pose a low risk of passing

into breast milk in significant amounts.

Mothers are advised to always inform their doctor or pharmacist that they are breastfeeding so that appropriate medicines can be selected.

They should also discuss with a healthcare professional before starting or stopping any medicines.

Use of health supplements and traditional preparations should also be informed to their doctor or pharmacist.

When medicines are necessary, mothers may consider feeding the infant just before taking the medicine to minimise the amount of drug transferred into breast milk.

For short-term use of medicines that may pose a risk to the infant, mothers may consider expressing breast milk before starting the treatment to maintain milk supply, and discarding the milk expressed while they are taking the medicine.

Breastfeeding should only be resumed after allowing sufficient time for the medicine to be fully eliminated from the body.

For mothers who require long-term treatment with medicines that pass into breast milk and may harm the infant, replacing breastfeeding with infant formula may be considered.

This decision should be discussed with a doctor or pharmacist, including guidance on weaning and selecting an appropriate formula for the infant.

Nevertheless, careful monitoring of the infant is important when mothers are taking any medicines.

Mothers are advised to observe their babies for any possible side effects, such as excessive sleepiness, unusual fussiness or irritability, changes in sleeping or feeding patterns, diarrhoea, skin rashes, breathing difficulties, or the infant appearing limp or floppy after feeding.

If any of these signs are observed, mothers should seek medical attention promptly.

As a conclusion, breastfeeding remains the best option for infant nutrition, and most medicines can be used safely during breastfeeding when appropriately selected.

The use of medicines during lactation requires a careful balance between effective treatment for mother and safety for baby, with each medicine assessed on an individual basis.

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