



SIGNS OF A DRUG MISMATCH

AFFORDABLE GENETIC TESTS are helping Thai patients avoid adverse drug side effects.

Thailand has the world's second highest proportion of patients with Stevens-Johnson Syndrome (SJS)/toxic epidermal necrolysis (TEN), an extreme skin reaction that occurs mostly as an adverse reaction to drugs. While the reaction is rare, parts of the skin can peel off in entire sheets, resulting in death for 10% of patients.

With pharmacogenetic testing, a genetic analysis that anticipates the body's response to drugs, severe reactions like SJS/TEN are largely preventable. A number of initiatives are in progress, so that such tests can be implemented in Thailand.

Seizure drug success

Thailand's first pharmacogenetic success came with carbamazepine, a drug used to treat seizures. "Testing for a reaction-inducing version of a gene called HLA prevents 90% of SJS/TEN cases caused by carbamazepine," explains Surakameth Mahasirimongkol,

an epidemiologist at the Ministry of Public Health. "The test cost nearly US\$100, however, so we developed our own version for the Thai population by taking into account local genetic variations. We were able to lower the cost to US\$30, a price that patients could pay right away."

"WE'VE BROUGHT DOWN THE NUMBER OF ADVERSE REACTION CASES BY 80% SINCE 2009"

In 2018, the national universal healthcare scheme began covering the test, making Thailand the first middle-income country with full access to preventative genetic testing for SJS/TEN. While there were 131 cases of carbamazepine-induced severe reactions in 2013, this plummeted by 68% to 42 patients by 2016. The goal now is to hit fewer than 10 per year.

Next on the horizon is providing national health insurance coverage for testing for allopurinol, a drug used to treat gout and kidney stones. Allpurinol is a leading cause of severe skin reactions including SJS/TEN, and between 5% to 10% of Thai people carry a variant of a gene associated with adverse reactions from the drug. "Covering genetic testing for allopurinol would cost 10 times more than for carbamazepine, as there would be more eligible patients," says Mahasirimongkol. "The cost issue needs to be addressed, but we're working to get approval within one to three years."

All-in-one test

Mahasirimongkol envisions a future where Thai healthcare professionals use a genetic reference table to flag patients in advance for known adverse drug reactions. Whole genome sequencing would play an essential role, as it can test for

hundreds of genes associated with drug reactions at once.

"We've brought down the number of adverse reaction cases by 80% since 2009, but it took more than a decade to implement a single pharmacogenetic test in the health system – that's way too long," he says. "With whole genome sequencing however, you only need to sequence once, and the data can be entered in electronic health records for future reference. I see that as the way forward." ■



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