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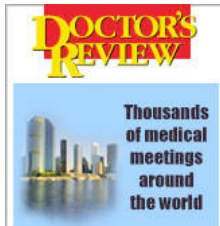
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ADVANCES in MEDICINE

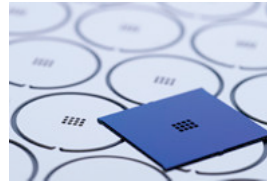
Spit test spots recent heart attacks

Speeds up diagnosis, reduces the number of missed MIs

BY CHRISTINA SCHALLENBERG



Pinpointing patients who've just suffered a heart attack may soon be as simple as asking them to spit into a tube. Transfer the saliva onto a lab card with integrated bio-chip, push that card into an analyser — and voilà, 15 minutes later you have your answer. The test is quick and painless and could be administered in the ambulance, yielding a result even before the patient arrives at the hospital.



Nano-bio-chips like this one made of silicon (in blue) can be used to test saliva for characteristics of heart disease

Photo credit: Glen Simmons

"Right now, an EKG is the first thing that's done when you suspect a heart attack, but it misses 25 to 50% of MI patients," explains John McDevitt, PhD, one of the lead scientists investigating this new technology at the University of Texas. "After the EKG, the next step is a blood-based test, for which the patient needs to wait in line, etc. All said and done, it often takes between 60 and 90 minutes for the results to come back." If the person has indeed suffered a heart attack, the 'golden hour' — the time slot when treatment is most crucial — has been squandered.

That's where the saliva test may make a huge difference. As a companion to the EKG, ie administered early on, it could greatly reduce the number of missed MIs upstream in the diagnostic pathway. Explains Dr McDevitt: "In our recent trial, the EKG alone missed 33% of heart attack patients. When it was combined with the spit test, that number went down to 3%."

SAME, BUT DIFFERENT

The principle behind the test is similar to that of current serum-based assays measuring cardiac markers such as CK-MB, myoglobin and troponin I. It analyses proteins present in saliva that correspond to heart damage in roughly the same way as the markers used in blood tests. From an initial 109 proteins they were looking at, Dr McDevitt and his colleagues have narrowed it down quite a bit: "Four proteins can shoot up an answer that's nearly equivalent to the FDA-approved serum-based test."

A definitive plus of the saliva test is its ease of use. While patients currently still have to spit into a tube, it's quite possible that in the future, they may be able to spit directly onto the lab card — the researchers are still figuring out what makes the most sense in this respect. For the healthcare provider, the test is simple, quick and convenient. The lab card has the same format as a credit card, and when asked about the size of the analyser, Dr McDevitt cheerfully reports that "it's about half the size of a toaster." In other words, it's very transportable and should fit easily into any ambulance.

TEST OF TIME

So how long until the spit test hits the market? Right now, the technology is still in the clinical testing phase, so it'll likely be another two to five years before it becomes commercially available. But the good news is that the lab card for acute MI is only the beginning — there's lots more in the pipeline. For instance, the researchers are also working on a bio-chip that assesses the risk of a future heart attack or other cardiovascular event. "This kind of chip could be used at the GP's office or pharmacy to provide direct feedback to patients on how lifestyle changes affect their health. There's a score they can look at to see how they're doing," explains Dr McDevitt. He goes on to say that his group is currently talking to dentists to see whether the test could be combined with dental exams: "The dentist appointment is the most regular check-up that people go to, often twice a year. But not everybody goes for their yearly physical." Such regular monitoring would allow patients and healthcare providers to keep an eye on the progression of risk factors.

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