The way to get back in service

Are you one of the 60% of men over 40 who suffers from erectile dysfunction (ED)? Do you fall into the 30% of men with ED for whom medication does not work?

Perhaps you are among the increasing numbers of younger men showing signs of erectile problems, as stress and other lifestyle factors take their toll, between the sheets?

If you or your partner falls into any of the above categories, you may be interested to know about the findings of a new US study on the effects of the chemical, nitric oxide (not to be confused with nitrous oxide, commonly known as laughing gas), on the erection process.

Scientists have known for two decades about the biochemical factors that trigger penile erection, but not what's needed to maintain one, say researchers from John Hopkins Hospital, the teaching hospital and biomedical research facility of Johns Hopkins University School of Medicine, in Baltimore.

They say their research into nitric oxide, published in a recent issue of the *Proceedings of the National Academy of Science*, uncovers the biochemical chain of events involved in that process.

New therapies

The information may lead to new therapies to help men who have ED, they say. There have even been suggestions that new drugs could be on the market in three to four years.

"We've closed a gap in our knowledge," says senior author of the study, Dr Arthur Burnett, a professor of urology at Johns Hopkins Medicine, in a university press release.

"We knew that the release of the chemical nitric oxide, a neurotransmitter that is produced in nerve tissue, triggers an erection by relaxing muscles that allow blood to fill the penis," says Burnett, who enjoys a reputation as a world authority in the science and medicine of male ED.

"We thought that was just the initial stimulus. In our research, we wanted to understand what happens next to enable that erection to be maintained."

Burnett says the researchers now understand that the nerve impulses that originate from the brain, and from physical stimulation, were sustained by a cascade of chemicals generated during the erection following the initial release of nitric oxide.

The key finding is that after the initial release of nitric oxide, a biochemical process called phosphorylation takes place to continue its release and sustain the erection.

Erectile dysfunction renders men unable to have or to sustain an erection, say experts.

While there are no definitive statistics on how many men in South Africa suffer from ED, Johannesburg endocrinologist Dr Sindeep Bhana says the incidence in this country is likely to reflect trends in the US, including the findings of the most comprehensive study in that country: the *Massachusetts Male Ageing Study*, which found that the ED affects up to 60% of men over the age of 40.

Causes

The study showed that ED has a variety of causes, including high cholesterol, diabetes, and a variety of lifestyle factors, such as stress and smoking, with between 5% and 15% of men reporting complete impotence.

Ironically, says Bhana, as the nitric oxide discovery moves doctors a step closer to beating the ailment, ED does offer an advantage: it can act as an early warning sign of cardiovascular problems.

Because the vessels supplying the penis with blood are smaller than the arteries supplying the heart, any blockage of the arteries leading to the penis is a precursor to tightening arteries in other organs, including the heart, says Bhana.

"Studies have already shown that if you have ED, you very likely to have a heart attack within the next 24 to 60 months," he says.

"Your penis talks to you before your heart," Bhana says.

Johannesburg cardiologist Dr Riaz Motara says a significant aspect of ED is not just to its established link to cardiovascular disease, but also to the medication used to treat it, as it is known to have an adverse effect on sexual function.

Motara also points out that heart disease, such as angina, heart attack or coronary artery disease, does not just affect the heart; it affects the arteries all over the body, including the kidneys, the eyes and the brain, and of course the arteries in sexual organs. So the blood flow is limited primarily from an organic process that is affecting the body, says Motara.

He says the side effects of heart disease medication, and specifically the drugs that are used to treat hypertension and the cholesterol, are known to cause ED.

"Generally, though, drugs for heart disease are safe, unless you are taking the drugs which are contra-indicated (for) some drugs for ED, which can cause a profound drop in blood pressure, and that is very dangerous," he says.

While much has been known about nitric oxide, to date scientists had not been able to synthesise it in order to reproduce and maintain it in the body.

The ability to do that, Motara says, will be significant to treat more than just sexual dysfunction in men.

Because the artery is the same all over the body, if an agent works for ED, it will work for other problems in the body as well.

It makes sense that if scientists can develop a drug or solution to improve nitric oxide production in the cells in the blood, that this will improve blood flow, and help to treat ED as well, Motara says.

However, any drug used to treat sexual dysfunction should be used as part of a holistic treatment plan, because of the variety of causes, says Motara. For example, he says medication or treatment of heart disease can cause ED, but the

disease process itself can cause erectile dysfunction.

"And of course there is the whole psychological (aspect)," Motara says, "where a man who has suffered a heart attack thinks he can't have sex because he is afraid he'll get another heart attack."

New drugs

Burnett says scientists have long known that the release of the chemical nitric oxide, a neurotransmitter that is produced in nerve tissue, triggered an erection by relaxing muscles that allow blood to fill the penis.

"In our research, we wanted to understand what happens next to enable that erection to be maintained," he says.

In a study of mice, Burnett and colleagues found a complex positive feedback loop in the penile nerves that triggers waves of nitric oxide to keep the penis erect. "The basic biology of erections at the rodent level is the same as in humans," Burnett says.

This built on their groundbreaking study published in the journal *Science* in 1992, in which Burnett and Johns Hopkins co-author Dr Solomon Snyder, a professor of neuroscience, showed for the first time that nitric oxide was produced in penile tissue.

Their study demonstrated the key role of nitric oxide as a neurotransmitter responsible for triggering erections.

"Now, 20 years later, we know that nitric oxide is not just a blip here or there; instead it initiates a cyclic system that continues to produce waves of the neurotransmitter from the penile nerves," says Burnett.

This will make it possible to develop new medical approaches to help men with erection problems caused by such factors as diabetes, vascular disease or nerve damage from surgical procedures, he says.

Bhana says that while the nitric oxide discovery had been on the cards for some time, it brings scientists a step closer to developing a drug that will be more effective than current medication, that does not work in all men.

"What they have now confirmed is that the nitric oxide stimulates the local tissue and the nerve tissue to produce a neuronal nitric oxide that maintains the erection," says Bhana.

"It means one more avenue to target in finding a drug that not only produces nitric oxide but that can maintain it. So now you will see drug research going into maintaining nitric oxide levels, and see how long they can keep it there."

Currently the most popular treatment for ED is with the class of drugs known as phophodiesterase type 5 (PF5) inhibitors that help boost blood flow to the penis. The most well known is Viagra, but others include Avanafil, Cialis, and Levitra.

However, doctors say that up to 30% of patients do not respond to one or another of these drug. There is also no way to tell who will respond to which drug, and men have to use trial and error to find which one works best and best suits their lifestyle.

US specialists at Harvard Medical School also advise a holistic approach. They say that an improved sex life will always involve more than just popping pills.

"The never-ending advertisements for (ED) drugs seem to suggest that popping a pill guarantees a great sex life for men dealing with this challenging problem," the doctors say in a recent issue of Health Beat, a publication of Harvard Medical School.

"A satisfying sex life takes a lot more than functioning body parts - ED can set in motion a cycle of emotional and

relationship problems," the doctors say.

"Fixing" the ability to achieve an erection may uncover other sources of sexual dysfunction, such as low libido, difficulties with arousal or sexual issues in a partner, they say. They advise seeing a sex therapist to devise a programme of treatment that deals with emotional and physical issues that contribute to ED.

Studies have already shown that if you have erectile dysfunction, you are likely to have a heart attack within two to five years.

Source: *Business Day* via I-Net Bridge

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