

'Rotten eggs' gas, fat and diabetes

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Researchers from the Peninsula Medical School in Exeter have for the first time identified a link between blood levels of the gas hydrogen sulfide (a gas more commonly associated with the smell of rotten eggs), obesity and type 2 diabetes.

The recent study published in the medical journal *Diabetologia* and presented at the British Microcirculation Society earlier this month, compared blood levels of [hydrogen sulfide](#) (H₂S) in lean men, overweight men with metabolic syndrome and male patients with established [type 2 diabetes](#) (T2DM).

Recent laboratory studies have shown H₂S which is produced naturally in the body from enzymes, is able to dilate [blood vessels](#) and regulate insulin production. However, until now there have been no clinical studies investigating the role of H₂S in the human circulation in health or in disease.

The study found that compared to lean and healthy men, blood levels of H₂S were twice as low in men with [metabolic syndrome](#) and up to four times lower in patients with diabetes. Men with low blood H₂S levels also had higher [blood pressure](#), higher levels of blood sugar, raised lipid levels, had increased resistance to insulin and had damage to small blood vessels in the skin.

The research team also showed that the amount of H₂S in the blood was determined by the extent of fat deposition in the body, in particular the amount of central or tummy fat. They found that blood H₂S levels were

significantly lower in people with a larger waist or hip measurement and higher BMI ([body mass index](#)) compared to those observed in lean people.

Dr. Matt Whiteman, who led the study at the Peninsula Medical School in Exeter, commented: "We have previously shown that the body can make H₂S in response to a variety of stimuli and that when it's made it can dilate blood vessels, reduce blood pressure and control the synthesis of insulin. However, up until now these observations were limited to the laboratory experiments using either isolated cells or tissues. This current study now translates these laboratory findings into a clinical setting."

Dr. Whiteman added "It is well known that with increased adiposity (or fatness), in particular central adiposity (higher waist measurements), that there is an increased likelihood of developing diabetes and vascular disorders such as high blood pressure and stroke. It would appear that only a small increase in adiposity leads to a significant reduction in blood H₂S levels. This may greatly impact upon the circulation since it will result in the loss of a key natural vasodilator and contribute to the vascular and biochemical complications associated with being overweight and having diabetes."

Dr. Whiteman further added that "our study also adds credence to public health programmes that encourage people to control their weight through exercise and diet, as a means to control the development of vascular disease and diabetes."

Provided by The Peninsula College of Medicine and Dentistry

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