

Fat transforms vitamin C from 'good cop' into 'bad cop'

Fat in the stomach may cause vitamin C to promote, rather than prevent, the formation of certain cancer causing chemicals, reveals research published ahead of print in the journal *Gut*.

The researchers analysed the impact of both fat (lipid) and vitamin C (ascorbic acid) on nitrite chemistry in the upper (proximal) stomach, which is especially vulnerable to pre-cancerous changes and tumour growth.

Nitrites, which are present in human saliva, and in certain preserved foodstuffs, may be converted to cancer causing compounds called nitrosamines.

Nitrosamines are formed in acidic conditions, such as those afforded by stomach acid, but vitamin C inhibits their formation, by converting nitrite to nitric oxide.

The researchers replicated the chemical conditions of the proximal stomach and measured the formation of nitrosamines, oxygen, and nitric oxide.

Without fat, vitamin C curbed the levels of two nitrosamines by a factor of between five and 1000. And it completely eliminated the production of the other two.

But when 10% fat was added, vitamin C actually boosted the production of nitrosamines between 8 and 140-fold.

Fat remains in the proximal stomach for some time after a meal and also makes up a substantial amount of the cells lining the stomach, say the authors.

Nitric oxide is formed when vitamin C reacts with nitrite in acid. However, the nitric oxide can diffuse into fat and then react with oxygen to form nitrosoamine generating chemicals.

The findings may be relevant to the recent observations that vitamin C supplements fail to reduce cancer risk, say the authors.

Source: BMJ Specialty Journals

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