MedicalXpress

Iron in the blood could cause cell damage, say researchers

February 11 2016

Concentrations of iron similar to those delivered through standard treatments can trigger DNA damage within 10 minutes, when given to cells in the laboratory.

This is the finding of scientists from Imperial College London, who suggest that researchers need to look carefully at the amount of iron given in standard treatments, such as tablets and infusions, and the effects this could be having on the body.

Iron is essential for the body to function and has a crucial role in transporting oxygen—low levels cause anaemia which leads to tiredness and lethargy. Iron tablets, which are available over the counter or on prescription, are taken by millions of people in the UK—with six million prescriptions issued each year for iron tablets in England and Wales alone.

In the study, published in the journal *PLOS ONE*, the team used human endothelial cells, which line blood vessels, and added a placebo or an iron solution of 10 micromolar (a similar concentration to that seen in the blood after taking an iron tablet).

Through looking at genes used within cells, and then examining the cells in more detail, they found that within ten minutes, cells treated with the iron solution had activated DNA repair systems. These were still activated six hours later.

Dr Claire Shovlin, senior author of the study, at the National Heart and Lung Institute at Imperial, said: "We already knew that iron could be damaging to cells in very high doses. However, in this study we found that when we applied the kinds of levels of iron you would find in the blood stream after taking an iron tablet, this also seemed to be able to trigger cell damage—at least in the laboratory. In other words, cells seem more sensitive to iron than we previously thought."

Dr Shovlin added: "This is very early stage research, and we need more work to confirm these findings and investigate what effects this may have on the body. We are still not sure how these laboratory findings translate to blood vessels in the body."

She stressed that prescribed iron supplements are essential for many patients: "We're not at the stage yet where we would advise doctors to change their approach to prescribing iron supplements. Many people need extra iron—it is crucial to allow our bodies to function properly—and anyone with any concerns about their iron supplements should talk to their healthcare provider.

"However, this study helps to open the conversation about how much iron people take. At the moment, each standard iron tablet contains almost 10 times the amount of iron men are recommended to eat each day - and these dosages haven't changed for more than 50 years. This research suggests we may need to think more carefully about how much iron we give to people, and try and tailor the dose to the patient."

The team initially started researching this area after finding that a small proportion of people using iron tablets for the condition hereditary haemorrhagic telangiectasia, which causes abnormalities in the blood vessels, reported their nose bleeds got worse after iron treatment.

Provided by Imperial College London