Grant awarded to Biomineral Research Team for work on iron supplement

Iron deficiency: could a new supplement offer freedom from side effects?

Estimates suggest around two billion people – nearly one third of the world's population – are affected by iron deficiency.[1,2]

Children and pregnant women are particularly vulnerable and iron deficiency puts the health of mothers and babies at risk, and affects the physical and intellectual development of children. Sufferers of all ages are prone to infection, feel tired and weak, and find it difficult to concentrate.

Researchers at MRC HNR are developing a new iron supplement, which they hope will be effective, cheap and safe.

A project led by Dr Jonathan Powell and Dr Dora Pereira at MRC HNR has been awarded a £83k grant for 1.5yrs by Action Medical Research and WellChild.

A little more detail:

What's the problem and who does it affect?

Iron deficiency: a major threat to health

Around one in ten pre-school children, one in four school-age children and one in 20 adults in the UK are anaemic because they are deficient in iron.[3-6]

Numbers are even higher in developing countries.[3-6] Iron deficiency is in fact the most common and widespread nutritional disorder in the world.[7]

People who are anaemic due to iron deficiency are more prone to infection, they feel tired and weak, look pale, and find it difficult to concentrate and work effectively. Pregnant women, new mothers and children are most vulnerable. Some sadly lose their lives, normally around the time of childbirth.[7]

Worrying evidence suggests iron deficiency also impairs the physical and intellectual development of young children meaning, for example, that their IQ can be reduced by up to 10 points by the time they reach school age.[8-10]

Current treatments are inadequate. Iron supplements tend to cause side effects, such as abdominal pain, nausea, vomiting and irritation of the bowel. Many people find these side effects so unpleasant that they decide not to take their supplement.

What is the project trying to achieve?

Formulating a new iron supplement

The researchers are developing a new iron supplement that they believe resembles the iron forms naturally present in the intestine after we eat our food. They think this approach could reduce the number of side effects people experience when taking iron supplements.

The researchers are synthesising ten different formulations, which all contain iron but differ in their chemical composition. They are testing how well the formulations dissolve in test-tube conditions that mimic the inside of the stomach and intestines before and after a meal. This provides important information on how well the iron formulations are likely to be absorbed into the body.

Another important consideration is how good the iron formulations are at crossing the walls of the intestine and passing into the bloodstream. The researchers are investigating this using human cells.

The researchers are also checking how safe the iron particles are likely to be using standard tests of toxicity on human cells.

By the end of these studies, the researchers hope to have identified the formulation of the new iron supplement that seems to work best in the laboratory.

Who stands to benefit from this research and how?

A top-ten risk to health

By the end of this project, the researchers hope to have formulated a new iron supplement. The next step would be clinical trials, which would test the supplement's safety and effectiveness.

The researchers believe that the new supplement would be cheap enough for widespread use. Perhaps even more importantly, they believe it will not cause the troublesome side effects that are common with existing oral iron supplements.

Children and adults who are anaemic due to iron deficiency stand to benefit. Estimates suggest the health of three million children would benefit from an improved iron status in the UK alone.[3-6]

The World Health Organization ranks iron deficiency as one of the top ten most important risks to human health.[1] Iron deficiency affects an estimated two billion people and causes almost a million deaths a year.[1] Pregnant women, babies and children are particularly vulnerable to the most harmful effects of iron deficiency. But it causes a susceptibility to infection, tiredness, and difficulties concentrating and working in people of all ages.

It is clear that the need for a new iron supplement, which is cheap, safe and effective, is very great indeed.

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