

# Using iron dextran to treat iron-deficiency anaemia

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Poor compliance with intravenous therapy can be an obstacle to the adequate management of iron deficiency anaemia in non-renal patients. This article reviews a project where the use of low molecular weight iron dextran complex as an alternative to iron sucrose was investigated



The new intravenous iron regimen reduces the overall costs of treatment, including spending on providing hospital transport

**P**atients at the City Hospital in Birmingham with severe iron deficiency anaemia have in many cases been treated with intravenous (IV) iron supplementation, rather than a blood transfusion, for several years. The move away from using blood was a result of its decreased availability, meaning that it needed to be reserved for those most in need. Some reasons for the reduced availability of blood are set out in Panel 1 (p225).

Iron sucrose, at a dose of 100mg administered three times a week for six weeks (ie, 18 doses in total), was the IV iron formulation initially used at the hospital. However, there was mounting evidence that poor compliance was an issue with this treatment. This article looks at how and why the IV iron supplementation protocol, for those patients who are either inadequately treated by, or intolerant of, oral iron preparations, was changed at City Hospital in Birmingham.

It should be noted that patients with renal failure typically make up a significant proportion of patients with iron deficiency anaemia. Such patients are, however, managed within the hospital in a satellite department of the renal unit at the Queen

Elizabeth Hospital. Drug supply for these patients is not the responsibility of the pharmacy at City Hospital in Birmingham. Oncology patients with iron deficiency anaemia were treated with a blood transfusion when this study was undertaken. Therefore, patients at City Hospital in Birmingham with iron deficiency anaemia who receive IV iron will generally be those who are pregnant, or have menorrhagia, a poor diet or a gastrointestinal condition.

## Assessing compliance

At the end of 2001, we undertook an audit to assess compliance with the IV iron sucrose regimen. Of 28 patients who had started the treatment regimen at the time of the audit, only two (7 per cent) went on to complete their prescribed course. A further four (14 per cent) patients received between 12 and 17 doses and five (18 per cent) received between six and 11 doses. The majority, 17 patients (61 per cent), had fewer than five (of the 18) doses.

The audit clearly indicated that there was poor compliance with the IV iron sucrose regimen among patients, suggesting that there was a failure to manage the anaemia adequately in all but a few patients. Undoubtedly, a significant cause of poor compliance was the inconvenience of attending the hospital three times a week for six weeks to receive the IV iron sucrose infusions.

Staff at the hospital were also aware of reports that pain on administration frequently occurred when IV iron sucrose was administered. Tissue damage was also said to be an issue, with reports from another hospital of cases of deep tissue damage (ie, extravasation) that had required plastic surgery to repair. Tissue damage is thought to result from the alkalinity of iron sucrose (approximately pH 11 when undiluted and pH 9.5 when diluted), which renders it a potential irritant.

Using repeat-dose IV iron sucrose also presented logistical and planning issues for health care staff at a time when resources were stretched.

## New policy

With the result of the audit in mind, a policy review was undertaken in 2002 with the aim of encouraging more patients to receive their IV iron.

An alternative IV iron supplementation regimen was developed, based on the use of low molecular weight iron dextran complex. This can be used at a dose of iron of up to 20mg/kg at a single administration, customised to a patient's weight and ferritin levels. This is administered as a total dose infusion.

The main advantage of using low molecular weight iron dextran complex is that patients can receive their IV iron treatment in a single hospital visit. Resource planning

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## Panel 1: Reasons for the reduced availability of blood in the UK

- Individuals who have received a blood transfusion are no longer allowed to donate blood. This is expected to reduce supplies by 4 per cent
- The arrival of a diagnostic test for Creutzfeldt-Jakob disease (CJD) could reduce donation by an estimated 30 per cent, with people shown to be at risk of CJD being prevented from donating

is therefore easier. Indeed, this approach has helped reduce waiting times and waiting-list pressures. Patients appear pleased with the new regimen. There is less intrusion to their time (eg, time off work) and fewer hospital visits. There has also been fewer patients complaining of pain at the site of infusion or tissue damage.

A further consideration is the cost of giving up to 18 infusions of iron sucrose (eg, the use of 18 giving sets, cannulas and 100ml bags of saline and the associated nursing time and bed use). This is in comparison to administration of low molecular

weight iron dextran complex which requires only one giving set, one cannula and one 500ml bag of saline. This saving is further increased if patients need to use hospital transport for each visit to receive iron sucrose. While the bed stay is longer for administering low molecular weight iron dextran complex than for a single 100mg infusion of iron sucrose, there is a significant efficiency saving in bed management and nurse planning when taking into account the 18 occasions that a patient needs to attend to complete the original iron sucrose regimen. The cost of the low molecular weight iron dextran can also provide a small saving.

### — Outcome following review

A survey to complete the audit cycle undertaken 12 months after the implementation of the revised policy indicated that 30 patients had received low molecular weight iron dextran complex as a single administration. The highest dose administered was 1,300mg and compliance was 100 per cent.

### — Conclusion

Using 100mg IV iron sucrose three times a week for six weeks to treat iron deficiency

anaemia did not seem to be delivering adequate clinical outcomes to patients and also required a significant amount of pharmacist and nursing time. Moving to a policy where iron deficiency anaemia is treated with a single dose of low molecular weight iron dextran complex has improved compliance and allows nurses and pharmacists to manage their time more efficiently.

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