Iron Protein Succinylate (IPS)

1. Clinical trials referenced for bioavailability and side effects

(Liguori 1993)

A large study of 1095 anemic patients. They received either IPS (in two 60mg doses) or a ferrous sulfate controlled release tablet (105mg). Uses Hemoglobin repletion test.

Results

In first month, the sulfate group showed faster results, but at the end of the 60 days IPS results were noticeably better. The overall clinical rating was significantly in favor of ITF 282 (IPS) with 78.9% of favorable results vs 67.6%. For side effects "The general tolerability, although favorable with both treatments, was significantly more favorable with ITF 282"

My summary

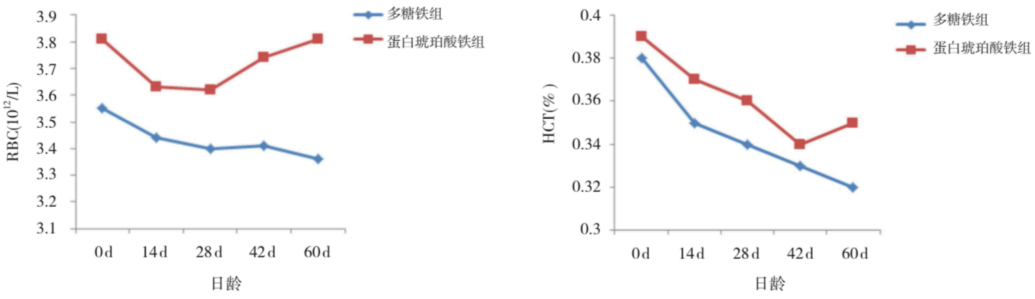
Hard to know what their favorable results % means without looking at the full study (could only access the abstract) but it seems it was **slightly more effective than slow release sulfate**. Also IPS seemed to have about **half the side effects**.

(Xing and Tong 2013)

Compared IPS to PIC in premature babies. Treatment lasts 60 days, compares Hb, RBC, serum iron, serum ferritin. Values for both treatments decreased, but towards day 60, IPS results increased.

Their conclusion:

IPS oral solution (red line) has good efficacy and tolerability in preventing and treating AOP (anemia of prematurity).



My summary

Hard to make too many conclusions from that study, **appears the same or slightly better than PIC** for premature babies**.** It would be interesting to have seen it for longer than 60 days, or compared with sulfate. Can't find the full article in english, just parts.

(Gennazzani et al. 1992)

Study of 81 iron deficient patients (average age 65). Only compared IPS against a control group receiving no iron. Measured Hb, RBC, TIBC, TSI, Serum ferritin. Improved a bit, but not useful enough for a comparison. Interesting to note that most of the indicators decreased at first before rising slightly.

(Cancelo-Hidalgo et al. 2013) – study outlined in gluconate section

Overall AE's (adverse events)

Ferrous sulfate with mucoproteose (SR) - 4.1%, Ferrous sulfate without mucuproteose 32.3% (11.21 relative to SR), iron protein succinylate - 7.3% (1.96 relative to FS SR) (no statistical difference).

My summary

So it has about a **quarter of the AE's of sulfate**, and about the same as slow release sulfate. Note that despite the big dataset there were no details on study, dosage or food.

(Najean, Acuto, and Scotti 1995)

This seems to be a study just like (Liguori 1993) but with 174 patients (nearly all female and all anemic). Again compares IPS with slow release ferrous sulfate. All laboratory efficacy variables were tested (Hb, Hct, RBC, etc.) over 2 months. Stats look slightly better for IPS but their conclusion is 'The differences between the treatments were not statistically significant.'

My summary

Showed **no statistical difference** between IPS and slow release sulfate bioavailability

(Careddu and Scotti 1993)

A study of 502 anemic children treated with either ITF282 (IPS) or ferrous polystyrene sulphonate. Study lasted 60 days, testing the usuals (hemoglobin, hematocrit, ferritin, blood iron, transferrin saturation, MCHC)

Again it found that IPS is more effective but not at the start 'indicating a more progressive and steady therapeutic effect'. 'The overall clinical rating was, although not significant, in favor of ITF 282'

Not much use to me as the reference iron isn't one i'm comparing. Not actually sure what ferrous polystyrene sulphonate is.

(Köpcke and Sauerland 1995)

Analysis of 3 trials with about 1800 patients. Compared the increase in Hb with 3 different treatments: ITF282 (IPS), iron sulphate (IS) and iron-polysterene sulphonate.

Similar results to the others, in that IPS was the same or lower than the 2 ref drugs in the first 30 days, but then **in the last 30 its efficacy was always better**. They make a suggestion for the reason - that the other treatments cause more irritation which then limits absorption even more. So rather than thinking of IPS improving over time, it's more that it stays more constant and the absorption of the others decrease as irritation builds. Just speculation but interesting. Also had **less side effects**.

(Haliotis and Papanastasiou 1998)

100 anemic children given either IPS or iron hydroxide polymaltose (a ferric polysaccharide) complex and monitored for 2 months (RBC, hematocrit, hemoglobin, MCV, serum iron, total iron binding capacity, and ferritin). **IPS results were better than the ferric polysaccharide** both after 30 days and 60 days.

1.1. Other info sources

http://www.pharmicsvitamins.com/resources/ips-science/

This is the spiel from the makers of Ferrets IPS. Disappointing that the only study they mention is one done on rats. The angle they push is what has come up in most the studies - High degree of tolerability and low toxicity.

(Raja et al. 2000)

Good article for explaining the mechanisms for absorption of IPS. It is insoluble in the acidic conditions of the stomach, and instead it's released in the intestines. They're not sure of the exact details, but the primary method of absorption is thought to be the same as other non-heme – reducing the ferric to ferrous and then through the ferrous pathway.

(Cremonesi and Caramazza 1993)

"ITF 282 is an iron succinyl casein complex containing 5% iron. The main property of the derivative is to keep iron bonded at acidic pH values. This accounts for a better tolerability of the compound compared with iron salts, during the treatment of iron deficiency. Pharmacological studies in normal and anemic rats demonstrated that this iron complex is almost as active as ferrous sulphate against iron deficiency anemia, but it is significantly less potent in increasing serum iron"

2. References used in this section

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