

Summary of the results of the clinical trial for laypersons

Title of the study: Clinical study on how a new iron supplement formulation is absorbed in women when taken in multiple doses
Protocol number: CRO-PK-25-380 - Sponsor code Z7257J01
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General information about the study: Iron deficiency is one of the most common nutritional deficiencies worldwide and can be due to low iron intake, increased iron requirement or excessive iron loss. Iron deficiency adversely affects physical, cognitive, and immunological functions, leading to fatigue, weakened immunity, and impaired cognitive performance. Different strategies can be carried out to correct iron deficiency, among which iron supplementation. Unfortunately, iron supplements often don't work as expected, because the body doesn't absorb the iron easily. Additionally, they may cause undesirable effects, including the unpleasant metallic taste and gastrointestinal discomfort. In this context, the Sponsor, Zambon S.p.A., has developed Monurelle® Ferro Naturale, a plant-based preparation based on spiruline naturally enriched in iron content. Based on the evaluation of the results of nonclinical studies, Monurelle® Ferro Naturale formulation appeared able to bind and transport the iron within human cells in a more assimilable and possibly better tolerable way in comparison with other iron formulations already present on the market. To investigate the behaviour of Monurelle® Ferro Naturale when administered to humans, the Sponsor conducted this clinical trial, whose primary objective was to evaluate the bioavailability of iron (i.e., the amount of iron that reaches the bloodstream) after single and multiple administration of the new formulation to healthy or with mild iron deficiency women. Furthermore, the study assessed the safety and tolerability of the formulation, as well as the participants' subjective evaluation and satisfaction with its intake. The clinical study was conducted at the Phase I Unit of CROSS Research S.A., located in Arzo, Switzerland. The first participant attended the first study visit on 01MAR2026, and the last participant completed the final visit on 29MAY2026.
Population of participants: Twelve (12) healthy or with mild iron deficiency women were enrolled in the study, received the study product and completed the study per protocol. The most important criteria for the participant's inclusion in the clinical study were the following: 1) Informed consent signed by each participant; 2) Women aged from 18 to 60 years (inclusive); 3) Ability to comprehend the full nature and purpose of the study and to comply with the requirements of the entire study; 4) Serum iron of 4-12 µmol/L (22.3 and 67.0 µg/dL) inclusive at preliminary visit; 5) Body mass index from 18.5 to 30 kg/m² inclusive, blood pressure and heart rate within normal limits, and no clinically significant abnormalities on physical examination, laboratory tests, or electrocardiogram (ECG); 6) Absence of diseases or allergies that could affect the study results; 7) Sterile or postmenopausal for at least 1 year or, if of child-bearing potential, in days 5-20 of the menstrual cycle during the study, not suffering from metrorrhagia, not breastfeeding, with a negative result of pregnancy tests and available to abstain from sexual intercourse or use an acceptable method of contraception until study completion.
Investigational product used: Prior to enrolment in the clinical study, participants underwent a preliminary visit. This visit included a physical examination, an ECG, an assessment of vital signs (blood pressure and heart rate), an alcohol saliva test, a serum pregnancy test, a drug screening test, and blood and urine laboratory analyses. Following this initial evaluation, the Investigator assessed participants' eligibility: only participants meeting all required criteria were enrolled in the clinical trial. The product Monurelle® Ferro Naturale was administered once a day for three consecutive days. Participants took the product by mouth, in the morning, at 08:00±1 h, under fasting conditions of at least 10 h. Blood samples were collected before taking the product and at several time points during the 8 h following its intake. These measurements were performed after the first and the third dose of the product, in order to assess iron levels after single and multiple product administrations, respectively. Furthermore, approximately 3 h after each product administration, participants completed a short questionnaire to evaluate their subjective satisfaction with the product. At the same time, the clinical staff assessed the gastrointestinal tolerability, by evaluating whether the participants experienced one of the following burdens: heartburn, stomach discomfort, stomach pain, abdominal discomfort, abdominal pain, nausea or vomiting.

Investigational product used (cont.): At the final visit, participants underwent a physical examination, an assessment of vital signs and blood and urine laboratory analyses to identify any change occurred with respect to the assessments performed at the preliminary visit. Throughout the entire study, participants were asked to report any change in their health status. The Investigator continuously checked the occurrence of any adverse effect, with particular attention to those potentially related to the intake of the study product.
Description of adverse reactions and their frequency: One side effect was experienced by one participant (8.3%) during the study: a participant suffered from vomiting of moderate intensity after the first administration of Monurelle® Ferro Naturale. Although assessed by the Investigator as related to study product, the event was transient and resolved spontaneously within the study end. Importantly, the participant continued the assumption of the investigational product without adverse effects and expressed a favourable opinion concerning both product satisfaction and gastrointestinal tolerability. Except for this episode, no other participants experienced gastrointestinal burdens due to product intake. No participants withdrew from the study due to an adverse event, and no serious or severe adverse events were reported. No effects of the study product on laboratory analyses results, vital signs, physical examination or body weight were observed throughout the study.
Overall results of the clinical trial: The results of this clinical study clearly showed a substantial increase in iron levels in the bloodstream after the intake of Monurelle® Ferro Naturale. The iron concentrations increased in all participants following both single and multiple administrations of the product. Both in single and multiple dose regimens, the highest concentration of iron was observed at 5 h after the administration of the study product. Specifically, at this time point, mean iron concentrations were approximately doubled compared to those observed prior the product intake after a single administration of the study product, whereas following three administrations, mean iron concentrations increased by about 60%. Importantly, no iron accumulation was observed. About the subjective assessments, the product received very positive evaluations: a large majority of participants - around 80% to 100% - reported being satisfied or very satisfied with the product. Most participants did not perceive a metallic taste following the product intake and, among those who found a metallic taste, it was described as mild or very mild. This is particularly relevant in clinical practice, as the persistence of a metallic taste is one of the factors contributing to poor compliance in iron supplementation treatment. In conclusion, more than 90% of participants would use the product again in the future.
Comments on the outcome of the clinical trial: Monurelle® Ferro Naturale was shown to substantially increase iron levels in the bloodstream, even just a single administration, and was well tolerated. This is supported by participants' feedback, with more than 90% declaring they would use the product again in the future.
Indication if follow up clinical trials are foreseen: Not applicable.
Indication where additional information could be found: Further information can be obtained by contacting the study sponsor, as indicated above.