Original Article

Ferrum phosphoricum 3X and *Ferrum metallicum* 3X in the Treatment of Iron Deficiency Anaemia in Children: Randomized Parallel Arm Study

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Abstract

Background: Anaemia in children has significant adverse health consequences and is a major public health problem. **Objective:** The objective of this study is to identify efficacy of *Ferrum phosphoricum* 3X (FP) and *Ferrum metallicum* 3X (FM) in changing haemoglobin (Hb) levels in school-going children, 12–14 years of age with Iron Deficiency Anaemia (IDA). **Materials and Methods:** School children were screened for Hb levels using a portable haemoglobinometer at Noida, Kottayam, Guwahati and Imphal. Children with Hb levels ≤11.9 g% and ≥8 g% were investigated for IDA by measuring serum ferritin level and other parameters. Children enrolled were divided into two categories, i.e., mild (Hb 11–11.9 g%) and moderate anaemia (Hb between 8 and 10.9 g%). Children in both the groups were randomised into FP and FM groups and prescribed accordingly for 3 months. Hb levels were repeated after 3 months. **Results:** 2,878 children were screened and 792 (27.5%) were identified to have Hb between ≤11.9 g% and ≥8 g%. 102 (mild anaemia: FP-30; FM-29, moderate anaemia: FP-21, FM-22) were enrolled after investigations and consent. Significant increase in Hb was seen in children with moderate anaemia in FP group (9.95 ± 0.749–10.97 ± 1.51). Increase in Hb in other groups was not significant. **Conclusion:** Percentage of children with low iron reserves and having true IDA was <4%. FP has a potential to improve Hb levels in children with no side effects.

Keywords: *Ferrum metallicum*, *Ferrum phosphoricum*, Haemoglobin, Homoeopathy, Iron Deficiency Anaemia, School Children, Serum Ferritin

Introduction

Anaemia, defined as low blood haemoglobin (Hb) concentration, is a public health problem that affects low, middle, and high income countries, has significant adverse health consequences, and impacts social and economic development. Although the most reliable indicator of anaemia at the population level is blood Hb concentration, measurements of this concentration alone do not determine the cause of anaemia. Anaemia may result from a number of causes, with the most significant contributor being iron deficiency. Approximately 50% of cases of anaemia are considered to be due to iron deficiency.[1]

A survey published in 2010 identified a very high prevalence of iron-deficiency anaemia (IDA) among the study population in India and reported that more than 95% of children, adolescent girls and pregnant women suffer from anaemia. The prevalence is the highest among the adolescents, i.e., 97.8% out of which 27.1% of adolescent girls, are severely anaemic.[2]

The cause of anaemia is identified by complete blood examination (Hb, mean corpuscular volume [MCV] or mean corpuscular haemoglobin [MCH], packed cell volume [PCV], iron studies, serum ferritin indices, etc.). Serum ferritin level is the most useful index of the diagnosis of iron deficiency. In an

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anaemic adult, a ferritin level below 15 µg/L is diagnostic of iron deficiency, and levels between 15 and 30 µg/L are highly suggestive.[3] Lower thresholds (from 10 to12 µg/L) have been used for children.[4]

The prevention of IDA requires an approach that addresses all the potential causative factors. Interventions to prevent and correct iron deficiency include the measures to increase iron intake through food-based approaches, namely dietary diversification and food fortification with iron, iron supplementation and improved health services and sanitation.[5] Iron supplementation, however, is the mainstay of treatment.

Homoeopathy treatment focuses on better absorption and utilisation of iron in the body, rather than on supplementation as per the recommended dietary allowances per se. As per homoeopathic literature, *Ferrum phosphoricum 3X (FP)* increases Hb[6] and is useful for treatment of anaemia. *Ferrum metallicum 3X (FM)* is best adapted to young weakly persons who are anaemic.[6] Empirically, these medicines are used frequently by homoeopathic practitioners, alone or with other medicines for the treatment of anaemia in all age groups. A specific trial of FP or FM in IDA has not, however, been conducted.

This study was undertaken to identify the efficacy of homoeopathic FP and FM in changing Hb levels in children in the age group of 12–14 years suffering from IDA.

The study was approved by the Institutional Ethical Committee of the Central Council for Research in Homoeopathy vide its letter dated 4 July 2014 and retrospectively registered with Clinical Trial Registry of India under CTRI/2019/05/019077, dated 13 May 2019. All procedures were in accordance with the ethical standards of the responsible committee on human experimentation and with the World Medical Association Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects.[7]

Materials and Methods

Study setting

The study was conducted in school settings in the community to screen children suffering from IDA, who may as yet be undiagnosed. Further, provision of medicines and clinical assessments were undertaken in the school settings to ensure regular intake of medicines and assessments whilst reducing extra efforts on part of children or parents when the children as yet would be asymptomatic and therefore, not sick enough to visit health facility.

Identification of children with low haemoglobin (screening 1)

The study was undertaken by four centres of Central Council for Research in Homoeopathy at Dr. D. P. Rastogi Central Research Institute for Homoeopathy, Noida; National Homoeopathic Research Institute in Mental Health, Kottayam; Regional Research Institute for Homoeopathy, Guwahati and Regional Research Institute for Homoeopathy, Imphal. The schools where the Weekly Iron Folic Acid supplementation (WIFA) Program of the Government of India[8] had not been implemented at Noida (Uttar Pradesh), Kottayam (Kerala), Guwahati (Assam) and Imphal (Manipur) were approached. The study was undertaken where the school authorities gave approval for participation. A short orientation of identified teachers of the school was conducted. The parents of the children were informed about the study and voluntary written informed consent of parents was undertaken to measure Hb levels in the children in the age group of 12–14 years, using a portable haemoglobinometer. Verbal assent of the child was taken before undertaking the investigation.

Study duration

The study duration was between July 2015 and March 2018.

Testing for iron deficiency anaemia (screening 2)

After screening 1, children with Hb levels ≤11.9 g% and ≥8 g% were invited to participate in the study. A participant information sheet was sent to the parents and written voluntary informed consent of the parents and assent from children was taken for conducting detailed investigations for IDA. The investigations were serum ferritin, Vitamin B12 levels, C-reactive protein (CRP), serum iron, total iron-binding capacity (TIBC), red cell count, MCV, PCV, MCH and mean corpuscular haemoglobin concentration (MCHC). Stool examination was conducted to identify parasitic infestations. Parents of the children identified with severe anaemia (i.e., Hb level <8 g%) were advised to get appropriate treatment for their children, and these children were not included in the study.

Inclusion/exclusion criteria

Children with serum ferritin levels below 15 µg/L, low MCV (<87 fl), CRP, Vitamin B12 levels within normal range, no complaints of malaria (recent within the past 6 weeks), worm infestation, concurrent heart, liver or renal systemic condition were enrolled in the study. However, during the course of the study, very few children were identified with low serum ferritin (data presented in results), and the inclusion criteria were modified to include children with serum ferritin up to 50 µg/L with raised red cell distribution width. The criteria of low MCV were removed. However, in spite of this, adequate sample of children could not be enrolled (data presented in results section) and the criteria were further modified to include all children irrespective of serum ferritin levels.

Sample size

In the absence of reliable prevalence of low serum ferritin in children with low Hb, it was proposed to enrol an initial sample of 80 children in each group, i.e., 80 with mild and 80 with moderate anaemia to be further randomised and 40 allocated in each FP and FM groups. The total sample size was 160 children, including 10% dropouts.

Randomisation, blinding and intervention

Children enrolled were divided into two groups, i.e., those having mild anaemia (Hb between 11 and 11.9 g%) and

those having moderate anaemia (Hb between 8 and 10.9 g%). Children in both the groups were allotted serial numbers separately and randomised into two groups, i.e., FP group and FM group by using computer-generated random numbers. This was a single-blind study, where the participants at the study site were kept blind about drug allocation. Two tablets of FP or FM was prescribed to these children as per group allocation, to be taken twice a day for a period of 3 months. The medicines were procured from The Kerala State Homoeopathic Cooperative Pharmacy (HOMCO), Kerala, in a single batch, as tablets in blister packs.

Follow ups and assessments

Institutionally qualified homoeopathic practitioners conducted screening, assessments and follow-up of all children enrolled in the study. Fortnightly follow-ups, for a period of 3 months, were conducted at the school premises. The presence of a school teacher was mandatory during these assessments. Parents were free to contact the study investigators at these pre-scheduled follow ups in the school or could contact the investigators at the research centres on other days. Laboratory investigations were conducted at the end of 3 months. Change in Hb levels, serum ferritin, serum iron, TIBC, red cell count, PCV, MCV, MCH and MCHC and symptomatology of children was assessed. Adverse events during the period of treatment, if any, were also recorded. Mean values before and after the treatment were compared using the paired *t*-test.

Results

The study was conducted in 19 identified schools at the 4 centres. 2,878 children were screened and 792 (27.5%) were identified to have Hb between ≤11.9 g% and ≥8 g%. Nine children, who had Hb level below 8 g%, were not included in the study and their parents were informed to take treatment for their children from physician of their choice. Out of 792 children, consent of parents and assent of 474 (60%) children was obtained for undergoing detailed investigation for IDA. Out of these, 474 children were investigated for IDA. 368 children were excluded due to non-fulfilment of inclusion criteria and 4 children withdrew their consent. Out of 368 cases excluded, 354 (96%) cases had serum ferritin above 15µg/L signifying that their iron reserves were normal, which is considered a hallmark for IDA. 102 children were enrolled under the study. Centre-wise details of screening and enrolment are given in Table 1.

The desired sample of 160 children could not be achieved, in spite of best efforts of undertaking screening continuing from July 2015 to November 2017 in different schools. The screening could not be continued further because 'WIFA programme' had got initiated in almost all the schools. Conducting screening in children on regular supplementation of iron and folic acid would have defeated the study objectives, and identifying the very small percentage of children not taking supplements in schools posed logistic problems.

Intervention

It was identified that though 27.83% of school children screened had low Hb, the percentage of children with low iron reserves and having true IDA was <4%. Out of 102 children enrolled, 59 had mild anaemia and 43 had moderate anaemia. 51 children were prescribed FP and other 51 were prescribed FM [Figure 1], which included 29 boys (28.43%) and 66 (64.70%) girls. Out of these 102 children, 2 with mild and 1 with moderate anaemia dropped out from FP group, while 2 each with mild and moderate anaemia from FM group dropped out of the study, and their post-intervention investigation could not be done. Data of only those children who completed the study were analysed. All children were between the age group of 12–14 years, with a mean age being 12.96 ± 0.79 years [Table 2].

Change in haematological parameters in children with mild anaemia

Out of 30 children in FP group and 29 in FM group, 28 and 27 respectively, completed treatment, and their post-intervention investigations were conducted. Out of 28 cases on FP, Hb increased in 19 cases and reduced in 9 cases. Out of 27 cases on FM, Hb increased in 17, remained static in 2 and reduced in 8 cases.

In most of the children, serum Iron, TIBC, MCV, MCH and MCHC were found to be normal at baseline and continued to remain within normal range post-treatment. In cases where the values were not within normal, pre- and post-values have been compared to identify treatment response. Change in these parameters before and after treatment is given in Table 3.

Serum ferritin increased from 6.5 µg/L to 95 µg/L, 13 µg/L to 97 µg/L and 6.4 µg/L to 9.9 µg/L, in 3 children on FP and from 5.5 µg/L to 9.5 µg/L in one child on FM.

Table 1: Screening data region wise

Number of children	Guwahati (%)	Imphal (%)	Kottayam (%)	Noida (%)	Total (%)
Screened for Hb testing	596	182	827	1273	2878
No anaemia (Hb >12 g%)	324 (54.36)	178 (97.80)	710 (85.85)	865 (67.94)	2077 (72)
Mild anaemia (Hb: 11-11.9 g%)	159 (26.67)	2 (1.09)	97 (11.73)	269 (21.13)	527 (18.3)
Moderate anaemia (Hb: 8-10.9 g%)	108 (18.12)	1 (0.55)	20 (2.41)	136 (10.68)	265 (9.2)
Severe anaemia (Hb: <8 g%)	5 (0.008)	1 (0.55)	0	3 (0.23)	9 (0.3)
Excluded	267	3	107	313	690 (87)
Enrolled	00	00	10 (moderate: 7, mild: 3)	92 (moderate: 34, mild: 58)	102 (12.8)

Hb: Haemoglobin

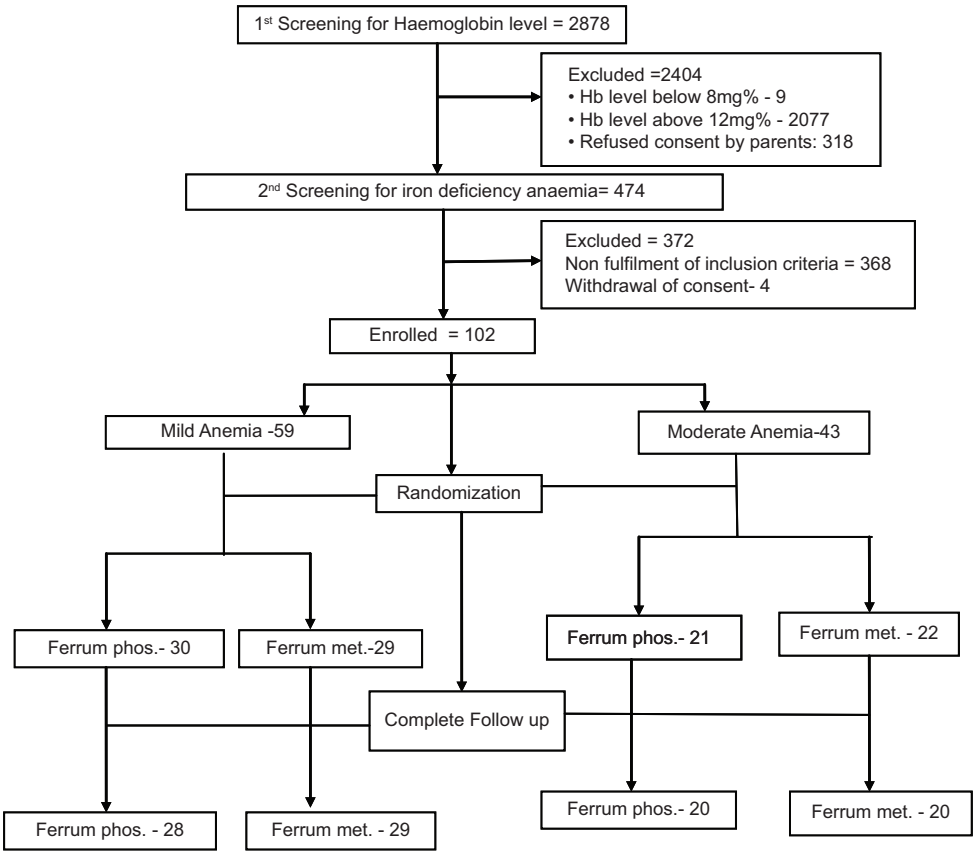

Figure 1: Flow chart of participants

Table 2: Gender distribution

Gender	FP		FM	
	Mild anaemia	Moderate anaemia	Mild anaemia	Moderate anaemia
Male (*n*)	9	6	6	8
Female (*n*)	19	14	21	12
Age (mean±SD)	13±0.86	13±0.79	12.77±0.75	13.15±0.74

FM: *Ferrum metallicum* 3X, FP: *Ferrum phosphoricum* 3X, SD: Standard deviation

Change in haematological parameters in children with moderate anaemia

Out of 21 children in FP group and 22 in FM group, 20 in each group completed treatment, and their repeat investigations were conducted. Hb was repeated in all children. Out of 20 cases on FP, Hb increased in 18 cases, remained static in 1 and reduced in 1 case. Out of 20 cases on FM, Hb increased in 12 cases, remained static in 1 and reduced in 7 cases.

In most of the children, serum iron, TIBC, MCV, MCH and MCHC were found to be normal at baseline and continued to remain within normal range post-treatment. In cases where the values were not within normal, pre- and post-values have been compared to identify treatment response. Change in these parameters before and after treatment is given in Table 4.

Change in serum ferritin in cases where serum ferritin was low, i.e., below 15 µg/L was seen in only 4 cases, which increased from 4.3 µg/L, 2.6 µg/L, 7.3 µg/L, 2 µg/L to 9.1 µg/L, 6.9 µg/L, 12.4 µg/L and 8.6 µg/L, respectively in children on FP. In children taking FM, serum ferritin, 5 cases had serum ferritin below 15 µg/L i.e., 2.8 µg/L, 5.8 µg/L, 7.4 µg/L, 8.3 µg/L, 13 µg/L which increased to 7 µg/L, 15.2 µg/L, 9.5 µg/L, 16.5 µg/L and 98 µg/L, respectively.

In children enrolled with serum ferritin below 15, change in Hb and serum ferritin was seen with both FM and FP [Table 5].

Discussion

To our knowledge, this is the first study to identify the specific changes in the haematological pattern in children with IDA after 3 months of regular intake of *Ferrum phosphoricum*/*Ferrum metallicum*. Out of 102 children enrolled, data of 95 children treated in either group [Figure 1] showed that 66 (69.47%) children had an increase in Hb percentage, whereas 4 (4.12%) children remained static and 25 (26.31%) had a decrease in Hb levels. The change in Hb was statistically significant in the 20 children being treated with FP who presented with moderate levels of anaemia. To detect the changes in mild anaemia of only 1 g%, on statistically significant parameters, a larger sample of children is needed than that what was enrolled in the study. The response of children in FM group was not significant in either mild or moderate anaemia. This could also be due to

Table 3: Change in haematological parameters in children with mild anaemia

Parameters	FP				FM			
	n	Mean±SD		*P* (paired *t*-test)	*n*	Mean±SD		*P* (paired *t*-test)
		Baseline	After 3 months			Baseline	After 3 months	
Hb	28	11.51±0.26	11.57±1.49	0.817	27	11.43±0.44	11.5±1.62	0.832
Serum iron (below 60mcg/dl	11	42.39±14.26	63.4±36.11	0.067	8	47.35±10.60	88.37±32.55	0.017
TIBC (more than 450 mcg/dl)	3	485.33±25.32	301±22.71	-	1	486	498	-
MCV (<87 fl)	24	78.79±5.75	79.80±7.98	0.402	20	77.3±4.53	77.2±7.48	0.935
MCH (<29 pg)	18	26.19±1.47	25.58±2.62	0.323	18	25.49±1.93	25.13±2.69	0.587
MCHC (<34g/dl)	17	32.80±0.91	32.58±2.24	0.698	15	32.41±1.16	32.21±1.91	0.747

FM: *Ferrum metallicum* 3X, FP: *Ferrum phosphoricum* 3X, SD: Standard deviation, HB: Haemoglobin, TIBC: Total iron-binding capacity, MCV: Mean corpuscular volume, MCH: Mean corpuscular haemoglobin, MCHC: MCH concentration

Table 4: Change in haematological parameters in children with moderate anaemia

Parameters	FP				FM			
	n	Mean±SD		*P* (paired *t*-test)	*n*	Mean±SD		*P* (paired *t*-test)
		Baseline	After 3 months			Baseline	After 3 months	
HB	20	9.95±0.749	10.97±1.51	0.002	20	10.13±0.96	10.65±2.02	0.207
Serum iron (below 60 mcg/dL)	8	33.04±14.52	60.25±36.74	0.046	8	38.19±12.17	51.87±31.07	0.234
TIBC (more than 450 mcg/dl)	6	488.03±26.53	417.5±103.40	0.185	1	495.17±27.61	457±113.31	-
MCV (<87 fl)	18	72.93±8.88	77.03±13.01	0.031	20	72.55±9.14	74.86±8.62	0.230
MCH (<29 pg)	13	23.18±2.96	23.58±3.06	0.552	16	22.88±3.50	22.8±3.18	0.798
MCHC (<34g/dl)	10	31.4±2.19	32.17±1.70	0.370	12	31.23±1.03	31.66±2.01	0.487

FM: *Ferrum metallicum* 3X, FP: *Ferrum phosphoricum* 3X, SD: Standard deviation, HB: Haemoglobin, TIBC: Total iron-binding capacity, MCV: Mean corpuscular volume, MCH: Mean corpuscular haemoglobin, MCHC: MCH concentration

Table 5: Change in haemoglobin and serum ferritin in children with low iron reserves

	FM		FP	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
n	6	6	7	7
Haemoglobin (Mean±SD)	10.63±0.73	11.35±1.70	10.37±1.13	10.91±1.21
Serum ferritin (Mean±SD)	7.13±3.44	25.95±35.49	6.01±3.69	34.13±42.30

FM: *Ferrum metallicum* 3X, FP: *Ferrum phosphoricum* 3X, SD: Standard deviation

lower sample size. No adverse events were reported in any child in either group.

These children were attending their school regularly and were not 'unwell' or 'ill' to miss school, in spite of low Hb levels. They were largely healthy due to maintenance of iron reserves, i.e., normal serum ferritin levels. On specific questioning, they complained of non-specific muscular pains, weakness, tiredness, breathlessness on exertion or menstruation-related complaints. Most of them reported improvement in their complaints irrespective of change in Hb after 3 months. None of the children were on any additional treatment for IDA or for any of these complaints. The study objective was however, not to identify symptomatic indications for the use of the medicines, but to identify change in Hb and other laboratory parameters associated with IDA. The role of dietary factors cannot be ruled out in cases of anaemia, particularly in IDA. During the period of study, the dietary intake of children was identified by specifically asking them about their dietary habits. No major change in dietary habits in children was seen during the period of the study.

The choice of study medication was not based on symptom presentation, but was rather a pathological prescription, based on low Hb as the only criteria. This was undertaken to explore utility of homoeopathic medicines in large scale public health care programmes, where classical individualisation process becomes practically difficult to be implemented.

In two studies published in 2017, one identified prevalence of low Hb as 53.5% in children studying in 5th to 10th standards in schools on Ambalapuzha Taluk in Kerala,[9] whereas another study identified only 4.23% boys having low Hb as compared to 52.17% of girls in age group of

10–15 years.[10] A systematic review on the prevalence of anaemia in Kerala concluded that accurate estimate of anaemia prevalence could not be made due to inconsistency in estimation methods, proportion of severe anaemia among school children and adolescents in general population were less in recent studies as compared to studies published during 1990–2000.[11] A national survey on 72,660 non-pregnant women (age group 15–49 years) identified lowest percentage of low Hb in Kerala (22.4%) and Manipur (25.8%) as compared to the national average of 49.6% (with all other states having a prevalence of more than 30% at least).[12] No similar large-scale survey of recent years for children in age group of 12–14 years could be identified.

Considering the variation in the proportion of low Hb and iron deficiencies, it has been suggested that where ever possible, national surveys should measure IDA prevalence so that program planners and national stakeholders can better understand the aetiology of anaemia in their country.[13] Not many studies could be identified in the literature where haematological profile of anaemia has been conducted to examine the prevalence of IDA vis-à-vis prevalence of low Hb levels. Our study highlights the importance of detailed anaemia profiling both in survey and intervention studies considering wide variations between the regions.

Notwithstanding, low sample size as a limitation, the pragmatic approach adopted by undertaking the study in the population settings, rather than in health-care settings increase its external validity. To our knowledge, no other study reports identification of true IDA in children in the age group of 12–14 years in multiple schools in 4 cities and their response to Homoeopathic medicines. The study shows that homoeopathic medicine FP 3X has a potential to improve Hb in children with no side effects. The medicine can be used on a larger scale to ascertain true effects. A larger population-based study to explore utility of FP 3X as an alternative to iron supplements at a mass level, particularly in children, is suggested, especially where supplementation is reported to have caused side effects like gastro-intestinal disturbances and skin pigmentation.

Conclusion

Percentage of children with low iron reserves and having true IDA was <4%. Homoeopathic medicine *Ferrum phosphoricum* 3X has a potential to improve Hb in children with no side effects. Further, validation with larger sample size is required.

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Conflicts of interest

None declared.

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बच्चों में लौह न्यूनता रक्ताल्पता के उपचार में होम्योपैथिक फेरम ड्रगों (फेरम फॉस्फोरिकम एंड फेरम मेटलिकम) के बीच यादृच्छिकृत तुलनात्मक अध्ययन

पृष्ठभूमि: बच्चों में रक्ताल्पता का स्वास्थ्य पर प्रतिकूल प्रभाव पड़ता है और यह जनस्वास्थ्य की एक प्रमुख समस्या है। **उद्देश्य:** इस अध्ययन का उद्देश्य लौह न्यूनता रक्ताल्पता (आईडीए) से ग्रसित, 12–14 वर्ष की आयु वाले बच्चों में हीमोग्लोबिन (एचबी) के स्तरों को परिवर्तित करने में फेरम फॉस्फोरिकम–3X (एफपी) और फेरम मेटलिकम–3X (एफएम) की प्रभावशीलता की पहचान करना है। **पदार्थ और पद्धति:** भारत के चार स्थानों; नॉएडा, कोट्टायम, गुवाहाटी और इम्फाल में चुने हुए स्कूलों से स्कूली बच्चों की जांच एक पोर्टेबल हीमोग्लोबिनोमीटर का उपयोग करके एचबी स्तरों का पता लगाने के लिए की गई। एचबी स्तरों ≤11.9 ग्रा. प्रतिशत और ≥8 ग्रा. प्रतिशत वाले बच्चों का परीक्षण आईडीए के लिए सीरम फेरिटिन स्तर और अन्य मापदंडों को मापकर किया गया। नामांकित बच्चों को दो श्रेणियों में विभक्त किया गया, अर्थात् निम्न रक्ताल्पता (एचबी 11–11.9 ग्रा. प्रतिशत के बीच) और मध्यम रक्ताल्पता (एचबी 8 और 10.9 ग्रा. प्रतिशत के बीच)। दोनों समूहों के बच्चों को एफपी और एफएम में यादृच्छिकृत किया गया और तदानुसार 3 महीनों के लिए निर्धारित औषधि दी गयी। एचबी स्तरों को 3 महीनों के उपरांत दोहराया गया। **परिणाम:** 2,878 बच्चों की जांच की गई और 792 (27.5 प्रतिशत) बच्चों में एचबी का प्रतिशत ≤11.9 ग्रा. प्रतिशत और ≥8 ग्रा. के बीच पाया गया। 102 बच्चों (निम्न रक्ताल्पता: एफपी–30; एफएम–29, मध्यम रक्ताल्पता: एफपी–21, एफएम–22) का नामांकन परीक्षणों और सहमति के उपरांत किया गया। एफपी समूह (9.95 ± 0.749–10.97 ± 1.51) में मध्यम रक्ताल्पता वाले बच्चों में एचबी में महत्त्वपूर्ण वृद्धि देखी गई। अन्य समूहों में एचबी में वृद्धि महत्त्वपूर्ण नहीं थी।

निष्कर्ष: निम्न लौह संचय वाले और वास्तविक आईडीए रखने वाले बच्चों का प्रतिशत <4 प्रतिशत था। एफपी में बच्चों के एचबी स्तरों में बिना किसी दुष्प्रभाव के वृद्धि करने का सामर्थ्य है।

Étude comparative randomisée entre les médicaments homéopathiques à base de ferrum (Ferrum Phosphoricum et Ferrum Metallicum) dans le traitement de l'anémie ferriprive chez les enfants

Contexte: L'anémie chez les enfants, a des conséquences néfastes importantes pour la santé et constitue un problème majeur de santé publique. **Objectif:** L'objectif de cette étude est d'identifier l'efficacité de Ferrum Phosphoricum3X (FP) et Ferrum Metallicum3X (FM) pour modifier les taux d'hémoglobine (Hb) chez les enfants scolarisés entre 12 et 14 ans souffrant d'anémie ferriprive (IDA). **Matériel et Méthodes:** Les écoliers de certaines écoles de 4 régions de l'Inde - Noida, Kottayam, Guwahati et Imphal, ont été testés pour les niveaux d'Hb à l'aide d'un hémoglobinomètre portable. Les enfants avec des taux d'Hb ≤ 11,9 g% et ≥ 8 g% ont été étudiés pour l'IDA en mesurant le taux de ferritine sérique et d'autres paramètres. Les enfants inscrits ont été divisés en deux catégories, à savoir, anémie légère (Hb 11–11,9 g%) et modérée (Hb entre 8 et 10,9 g%). Les enfants des deux groupes ont été randomisés en groupes FP et FM et prescrits en conséquence pendant 3 mois. Les taux d'Hb ont été répétés après 3 mois. **Résultats:** 2878 enfants ont été dépistés et 792 (27,5%) ont été identifiés comme ayant une Hb comprise entre ≤ 11,9 g% et ≥ 8 g%. 102 (anémie légère: FP-30; FM-29, anémie modérée: FP-21, FM-22) ont été inscrits après les investigations et le consentement. Une augmentation significative de l'Hb a été observée chez les enfants présentant une anémie modérée dans le groupe FP (9,95 ± 0,749–10,97 ± 1,51). L'augmentation de l'Hb dans les autres groupes n'était pas significative. **Conclusion:** le pourcentage d'enfants ayant de faibles réserves de fer et ayant une véritable IDA était <4%. La FP a le potentiel d'améliorer les taux d'Hb chez les enfants sans effets secondaires.

Estudio comparativo aleatorio entre fármacos homoeopáticos de Ferrum (Ferrum Phosphoricum & Ferrum Metallicum) en el tratamiento de la anemia por deficiencia de hierro en niños

Fondo: La anemia en niños tiene importantes consecuencias adversas para la salud y es un problema importante de salud pública. **Objetivo:** El Objetivo de este estudio es identificar la eficacia de Ferrum Phosphoricum3X (FP) y Ferrum Metallicum3X (FM) en el cambio de los niveles de hemoglobina (Hb) en niños en escuela entre 12-14 años de edad con anemia por deficiencia de hierro (IDA). **Materiales y métodos:** Los escolares de escuelas seleccionadas en 4 partes de la India – Noida, Kottayam, Guwahati e Imphal, fueron examinados para los niveles de Hb usando un hemoglobinómetro portátil. Se investigaron niños con niveles de Hb de ≤11.9 g% y ≥8 la ida midiendo el nivel sérico de ferritina y otros parámetros. Los niños inscritos se dividieron en dos categorías, es decir, leves (Hb 11–11,9 g%) y anemia modoada (Hb entre 8 y 10,9 g%) Los niños de los grupos entraron aleatoriamente en grupos de FP y FM y se solicitaron en consecuencia durante 3 meses. Los niveles de Hb se repitieron después de 3 meses. **Resultados:** 2, 878 niños fueron examinados y 792 (27,5%) se identificó que tiene Hb entre ≤ 11.9 g y ≥ 8 g%. 102 (nivel de anemia: FP-30; FM-29, anemia moderada: FP-21, FM-22) se inscribieron después de las investigaciones y el consentimiento. Se ha observado un aumento significativo de la Hb en niños con anemia moderada en el grupo de FP (9.95 ± 0.749–10.97 ± 1.51). El aumento de la Hb en otros grupos no fue significativo. **Conclusión:** El porcentaje de niños con bajas reservas de hierro y con una verdadera AIF fue de <4%. FP tiene un potencial para mejorar los niveles de Hb en niños sin efectos secundarios.

Randomisierte Vergleichsstudie zwischen homöopathischen Ferrum-Medikamenten (Eisen Phosphoricum & Eisenmetallic) bei der Behandlung von Eisenmangelanämie bei Kindern

Hintergrund: Anämie bei Kindern hat erhebliche gesundheitsschädliche Folgen und ist ein großes problem der öffentlichen Gesundheit. **Ziel:** Ziel dieser Studie ist es, die Wirksamkeit von Ferrum Phosphoricum3X (FP) und Ferrum Metallicum3X (FM) bei wechselnden Hämoglobin(Hb)-Spiegeln bei schulischen Kindern im Alter von 12 bis 14 Jahren mit Eisenmangelanämie (IDA) zu identifizieren. **Materialien und Methoden:** Schulkinder aus ausgewählten Schulen in 4 Teilen Indiens – Noida, Kottayam, Guwahati und Imphal – wurden mit einem tragbaren Hämoglobinometer auf Hb-Niveau untersucht.Kinder mit hb-Werten von 11,9 g% und ≥8 g% wurden auf IDA untersucht, indem der Serumferritinspiegel und andere Parameter gemessen wurden.Die eingeschriebenen Kinder wurden in zwei Kategorien eingeteilt, d.h. (Hb 11–11.9 g%) und moderate Anämie (Hb zwischen 8 und 10,9 g%).Kinder in beiden Gruppen wurden in FP- und FM-Gruppen randomisiert und entsprechend für 3 Monate verschrieben.Die Hb-Werte wurden nach 3 Monaten wiederholt. **Ergebnisse:** 2.878 Kinder wurden gescreent und 792 (27,5%) wurden festgestellt, dass Hb zwischen ≤11.9 g% and ≥8 g%. 102 (milde Anämie: FP-30; FM-29, moderate Anämie:FP-21, FM-22) nach Untersuchungen und Zustimmung eingeschrieben wurden. Signifikanter Anstieg der Hb wurde bei Kindern mit mäßiger Anämie in der FP-Gruppe beobachtet. (9.95 ± 0.749–10.97 ± 1.51). Der Anstieg der Hb in anderen Gruppen war nicht signifikant. **Schlussfolgerung:** Der Anteil der Kinder mit niedrigen Eisenreserven und echten IDA-Werten betrug 4 %.FP hat ein Potenzial, Hb-Spiegel bei Kindern ohne Nebenwirkungen zu verbessern.

顺势疗法福莱姆药物之间的随机对比研究 (铁膜磷和铁膜金属) 儿童缺铁性贫血的治疗

背景：儿童贫血对健康有严重的不良后果，是一个重大的公共卫生问题。目的: 本研究的目的是确定铁膜磷3X的功效(FP)和 费鲁姆金属3X (FM) 改变 12-14 岁缺铁性贫血 (IDA) 的上学儿童的血红蛋白 (Hb)水平。材料与方法 : 来自印度4个地区选定学校的学子——诺伊达、科塔亚姆、古瓦哈蒂和因巴尔， 使用便携式血红蛋白计对 Hb 水平进行筛查。通过测量血清铁蛋白水平和其他参数，对Hb水平为±11.9g%和±8g%的儿童对国际开发代二代进行研究。 入学儿童分为两类，即轻度（Hb 11~11.9 g%）和中度贫血（Hb 之间 8 至 10.9 g%). 两组儿童被随机分成FP组和调频组，并相应开药3个月。Hb 水平在 3 个月后重复。结果：2，878名儿童接受了筛查，792名儿童（27.5%）被确定为有±11.9 g%和+8g%之间的Hb。102 （轻度贫血：FP-30;FM-29，中度贫血：FP-21，FM-22）经调查并征得同意。在FP组中度贫血儿童中，Hb显著增加 (9.95 ± 0.749 – 10.97 ± 1.51). 其他群体的Hb增加并不显著。结论：铁储量低且患有真实国际开发系统的儿童比例为+4%。FP有可能改善没有副作用的儿童的Hb水平。