

Relation between Detection of Iron Deficiency Anemia and Parents Unacceptable Behaviour in Children

Eilyad Issabeagloo^{1*}, Mohammad Taghizadieh², Parviz Kermanizadeh³, Reza forughi⁴

¹Department of Pharmacology, Medical Sciences Faculty, Tabriz branch, Islamic Azad University, Tabriz, Iran.

²Department of pathology, Medical Sciences Faculty, Tabriz branch, Islamic Azad University, Tabriz, Iran.

³Department of Immunology, Medical Sciences Faculty, Tabriz branch, Islamic Azad University, Tabriz, Iran.

⁴Department of Internal Medicine, Medical Sciences Faculty, Tabriz branch, Islamic Azad University, Tabriz, Iran.

ABSTRACT

Iron deficiency is one of the most common diseases. This disease is caused by low intake of iron. Iron need is much more than what is intaked. The infants should intake iron as a complementary food from 6 month years. Unfortunately, parents stop giving iron drops because of darkness teeth color.

This study is descriptive and cross-sectional. About 183 infants (from 12 month to 2 years) were participated in this study. These infants have referred to Tabriz's pediatric clinics in Iran within 2010 to 2011. The questionnaires were completed by the parents and the tests were done and inspected during the study.

In this study 183 infant participated that 77 people were female and 106 people were male. They were grouped in two groups. The first group (12 to 18 months) and the second group (18 months to 2 years) include 51.3% and 48.7% respectively. Then they were categorized in three groups: the first group has received the iron drop regularly (22%), the second group has not received the iron drop regularly (38%) and the third group has not received the iron drop at all (40%). The reason of this was inspected. 19.17% was because of parents imprudence, 35.6% because of family and their friends recommendation, 16.44 due to health officer's view, 5.06 due to physician recommendation and 9.6 due to pediatricians recommendation and 4% due to sundry reasons.

The main reason in iron deficiency breakout is the parents unacceptability in the country.

KEY WORDS: iron, iron deficiency, iron drop, infant

INTRODUCTION

Anemia has different type, which the most common type is iron deficiency anemia; in iron deficiency anemia due to iron deficiency the number of red blood cells decreases (1). Required daily amount of iron for one man is 1 mg/dl and for one woman is 1.4 mg/dl (2).

Mineral iron is absorbed 1-2% in people who do not have iron deficiency anemia, but in absorption of iron from meat, it is absorbed 20% (3). About the main causes of iron deficiency in addition to celiac disease, Crohn's disease, eating antacids, Chronic blood loss from hookworm disease in the digestive tract, gastrointestinal cancer, peptic ulcer, esophageal varices prolonged use of NSAIDs are also effective in the incidence of iron deficiency (1). This disease creates symptoms such as Weakness, Fatigue, Paleness, Koilonychia, anorexia, Pica, Glossitis, Restlessness, tachycardia in patients (2, 4, 5, 6, 7). Considering the frequent recommends about the use of iron drops (ferrous sulfate) in Term infants from 4 months and preterm children from 1 month, but some parents refuse to give the iron and cause irreversible damages to their children (8). Some parents due to the high number of children, low education levels, low levels of information, father's poor occupation status, due to multiple pregnancies, false cultures, and other people's false and inappropriate interference, refuse to give the iron. Despite enormous programs and investments in prevention of iron deficiency anemia and iron's free prescription from health centers, unfortunately, some parents still refuse to give the iron. Even the prevalence of iron deficiency anemia in our country has been reduced but it still has a high percentage.

Some parents refuse to give ferrous sulfate drops because it turns children's teeth color to black, while with simple and appropriate ways they can use iron drops without changes in teeth color and prevent the functional, cognitive and behavioral problems which may arise in the future for their children.

According to the high percentage of patients referred to the children clinics who refuse to give iron drops to their children because it turns teeth color to black and high prevalence of iron deficiency anemia in these children, we decided to study the prevalence of iron deficiency anemia in the children who suffer irreversible losses because of parents improper behavior.

*Corresponding author: Eilyad Issabeagloo, Department of Pharmacology, Medical Sciences Faculty, Tabriz branch, Islamic Azad University, Tabriz, Iran. Dr.e.issabeagloo@gmail.com Tel: +989144079927

MATERIAL AND METHODS

Patients:

This is a descriptive cross-sectional study. In this study 183 children who were aged between 12 months to 2 years, were examined, 77 children were female and 106 were male. These children born with ideal weight about 2.5-3.5 Kg and ideal height about 50±1.23 and ideal head circumference about 35±2 and were not diagnosed with any specific disease in their lifetime and were not the result of multiple Gestations.

Location and duration of the study: These children were selected from the children who referred to Tabriz’s pediatric clinics. Study duration was about 12 months of the winter 2010 to winter 2011.

Population of study was children who were aged 12 month to 2 years and were referred to Tabriz’s pediatric clinics. The sample size was about 183 children. Before starting the study, there were some explanations that in this study some questions will be asked and we will require some examinations and test from their children and the all information will be strictly confidential. We got their address and contact number for follow-up, if its needed. We gave them the questionnaire and explanation about each question was given, then the children were examined. Ferritin, Fe Serum, TIBC, CBC examinations was requested. We visit then one month after with the test results and they were visited every month during the study.

Ethical considerations:

We got the parental permission that obtained information will be kept confidential.

Studied instances:

Age, sex, prevalence of iron deficiency anemia, taking iron regularly or irregularly, non-consumption of iron, people advised not to use iron.

Statistical analysis: obtained data are presented as Mean±SD and also frequencies and percentages. Data Comparison was performed using chi square test. $P \leq 0.05$ were considered significant.

RESULTS

- Of the total examined sample, 51.4% in the age group 12 to 18 months and 48.6 percent are in the age group 18 months to 2 years.

Table 1: Distribution of patients based on age

	frequency	percent	Valid percent	Cumulative percent
Valid 12-18 months	94	51.4	51.4	51.4
18-24 months	89	48.6	48.6	100.0
Total	183	100.0	100.0	

- Also of the total examined sample, 42.1% were female and 57.9% were male.

Table 2: Distribution of patients based on sex

	frequency	percent	Valid percent	Cumulative percent
Valid Female	77	42.1	42.1	42.1
Male	106	57.9	57.9	100.0
Total	183	100.0	100.0	

- From the total examined patients, 21.9% regularly and 38.9% irregularly take iron and 39.9% were not taking iron.

Table 3: Distribution of patients in terms of taking iron

	frequency	percent	Valid percent	Cumulative percent
Valid Received the iron regularly	40	21.9	21.9	21.9
Received the iron irregularly	70	38.3	38.3	60.1
Not Received the iron regularly	73	39.9	39.9	100.0
Total	183	100.0	100.0	

- From all of the patients, 19.1% percent have iron deficiency anemia.

Table 4: Distribution of patients in terms of iron deficiency

	frequency	percent	Valid percent	Cumulative percent
Valid Have	35	19.1	19.1	19.1
Haven't	148	80.9	80.9	100.0
Total	183	100.0	100.0	

- In the total studied samples, in 19.2 % not taking the iron was because of parent’s imprudence (PI), in 35.6% it was because of Family and their friend's recommendation (FR), in 16.4% it was recommended by Health officer recommendation (HOR), in 15.1% it was because of Physician recommendation (PYR), in 9.6% it was recommended by Pediatrician (PDR) and in 4.1% it was because of sundry reasons (SU).

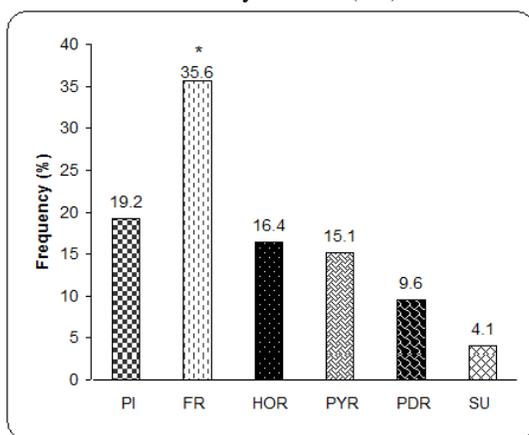


Figure 1: Distribution of patients in term of not taking the Iron. Results represented as abundance. * p<0.05

Table 6: Relationship between age and sex of patients

		sex		Total	
		Female	male		
Age	12-18 months	Count	34	60	94
		Age % within	36.2%	63.8%	100.0%
	18-24 months	Count	43	46	89
		Age % within	48.3%	51.7%	100.0%
Total	Count	77	106	183	
	Age % within	42.1%	57.9%	100.0%	

Table 7: relationship between Iron deficiency and consumption of Iron

		Iron deficiency		total	
		Have	Haven't		
Group	Received the iron regularly	Count	2	38	40
		Group % within	5.0%	95.0%	100.0%
	Received the iron irregularly	Count	9	61	70
		Group % within	12.9%	87.1%	100.0%
	Not received the iron	Count	24	49	73
		Group % within	32.9%	67.1%	100.0%
Total	Count	35	148	183	
	Group % within	19.1%	80.9%	100.0%	

- Review the reason of not taking the Iron:

We used One-dimensional chi square test. In fact we examined distribution of not taking the Iron reasons. The value of chi square test is 25.22, degree of freedom is 5 and significance level is equal to 0/000. Considering that the significance level of test is less than 0.05, distribution of not taking the Iron reasons has significant difference. Friends and family’s recommendation had the most frequency.

Table 8: Evaluation of not giving the Iron

	Observed No.	Expected No.	Residual
Parents imprudence	14	12.2	1.8
Family and their friend's recommendation	26	12.2	13.8
Health officer recommendation	12	12.2	-0.2
Physician recommendation	11	12.2	-1.2
Pediatrician recommendation	7	12.2	-5.2
Sundry	3	12.2	-9.2
Total	73		

DISCUSSION

IDA is a common problem for both the developed and the developing world. According to WHO, the prevalence of anemia among children of 0–4 years old in 1980 is as follows: Africa 56%, North America 8%, Latin America 26%, Eastern Asia 20%, North Asia 56%, Europe 14% and Oceania 18%. Around 43% of the world's children (12% in developed countries and 51% in developing countries) suffer from anemia (9, 10, 11, 12, 13, 14). Turkey possesses the greatest percentage of IDA among the Mediterranean countries: 44% of the children between 6 and 24 months of age have Hb values <11gr/ dl (15) In Morocco 35.4% of children 6 months to 5 years of age were found with Hb values below the normal limit (16).

It is reported that the prevalence of IDA in the developed countries has fallen under 20% in comparison to 70% of the developing countries (17). The 9.4% of iron deficiency and 4.3% of IDA that was reported in Spain has been attributed to insufficient iron diet (18). In Britain the prevalence of IDA in childhood varies widely depending on the socio-economic status, culture and nationality of the population, i.e. for Pakistanis it is 29% while for Indian 20% (19). In Ireland, the prevalence of IDA is reported as 2.6% in children aged 12 months and 9.2% in children aged 24 months (20). One of the reasons that parent avoid giving the Iron is that Iron oxides teeth and turn it's color to black. To prevent this, there is simple and appropriate solution. While giving the iron to the infant or child you should pour the irons drops into the rear of the mouth and subsequently give the water to the child and clean the teeth with tissue or cotton and diluted salt water (21). Iron deficiency anemia in children is mostly due to nutritional deficiency. World Health Organization has estimated that about 1/4 of the iron deficiency anemia patients population is specific to children before school age and women. Iron deficiency anemia is an important problem for developing countries in Asia and Africa. Increases of the need for iron during the pregnancy and breast feeding throughout the world is more than natural received edible iron (2). In this study, 183 infants who were aged between 12 month to 24 month were examined which about 22% had received Iron regularly, and 38% had received iron unordered and irregularly and 40% did not received Iron drops.

Overall 19.12% had iron deficiency anemia which 1.09% were children who had received Iron regularly, 4.91% were children who had received iron irregularly and 13.11% were children who did not received iron drops. According to the results of conducted study, 19.17% was due to recklessness of the parents, 35.6% was due to recommendation of friends and family upon damaging teeth, 16.44% was due to recommendation of health centers staff ,15.06% was due to the General Practitioners advises and 9/6% was due to pediatricians advises and 4% has been caused by other reasons. Both the educational level and the profession of either father and/or mother affect to the same degree the presence of IDA, possibly by influencing the general socioeconomic conditions of the family and consequently the nutrition and development of the child. Several studies have shown that the education level, especially of the mother, has a direct relationship to the iron intake and iron deficiency (22, 23). Similarly occupations that are associated with lower incomes affect the child's nutrition (24, 25).

Previous studies indicated that the incidence of iron deficiency anemia in patients who regularly referred to the health centers is low (26). On the other hand this is an important point that that countries who have significantly improved their socio-economic status, did not manage to wipe out or proportionally decrease the incidence of IDA (27).

Conclusion

Considering the high prevalence iron deficiency anemia in our society, despite national programs and efforts, lots of parents avoid giving Iron drops to children, although it is freely available through the health centers. Unfortunately, some unpleasant result was found in this study which indicated that not taking the iron drops was due to advises from some colleagues in health centers and some of General Practitioners and even pediatricians.

On the other hand, unfortunately parents due to fault thoughts and intervention of relatives refuse to give the iron to the children and cause adverse effects of iron deficiency anemia for their children. Suggestions which we have in this area:

- 1) Better training and education for medical students and more education about help to prevent iron deficiency anemia prevalence.
- 2) Knowledge of dental students with iron deficiency anemia and its adverse effects on people's live and training methods to prevent the color change of teeth to black because of taking the iron drops.
- 3) More education for health center staff and emphasis on proper performance of their duties.
- 4) More staff follow-up in health centers about children who are aged 6 month to 2 years in terms of taking and how properly taking the Iron drop.
- 5) Training courses and classes for parents who have children under 2 year old for making them familiar with benefits of giving iron drops and harms of not giving iron drop and training how to use iron drop to prevent tooth decay in children.
- 6) Preparing educational pamphlets for proper way to take the iron and benefits of taking the iron.
- 7) More education for parents through mass media.

However, the use of other strategies can be beneficial besides education.

The major approaches mentioned are: provision with medical treatment, fortification of foods with iron, dissemination of information on the importance of a healthy and balanced diet and control of virus epidemics and parasitic infestations (28, 29).

REFERENCES

1. Kumar, V., A.K. Abbas, N. Fausto and R. Mitchell, 2007. 8th edition, Robbins Basic pathology, Iron Deficiency anemia, Saunders/Elsevier Publishers, pp: 122.
2. Kasper, D.L, E. Braunwald, S. Hauser, D. Longo, J.L. Jameson, A.S. Fauci, 2008. 17th Edition, Harrison's Principles of Internal Medicine. McGraw-Hill, PP: 628.
3. Marcdante, K., R.M. Kliegman, R.E. Behrman, H.B. Jenson, 2010. 6th edition, Nelson Essentials of Pediatrics. Saunders/Elsevier Publishers, pp: 696.
4. Kliegman, R.M., R.E. Behrman, H.B. Jenson and B. Stanton, 2007, 18th edition, nelson Text book of pediatrics, Iron Deficiency Anemia, Saunders/Elsevier Publishers, Vol 3, PP: 2014 .
5. National institutes of health, 2009, *National laibrary of medicine*, paleness.
6. National institutes of health, 2010, *National laibrary of medicine*, Appetite- decreased.
7. Kliegman, R.M., R.E. Behrman, H.B. Jenson and B. Stanton, 2007, 18th edition, nelson Text book of pediatrics, *Dental Caries*, pp: 1534.
8. Lacile Packard children hospital at Stanford, 2011, *Iron Deficiency Anemia*.
9. DeMaeyer, E., M. Aaiels–Tegman, 1985. The prevalence of anemia in the world. *World Health Statistics quarterly.*, 38:302–316.
10. Viteri, F.E., V. De Tuna and M.A. Gusman, 1972. Normal haemoglobin values in the central American population. *Br J Haematol.*, 23:189–204.
11. Domellof, M., K.G. Dewey, B. Lonnerdal, R.J. Cohen and O. Hernell, 2002. The diagnostic criteria for iron deficiency in infants should be reevaluated. *J Nutr.*, 132:3680–3686.
12. Looker, A.C., P.R. Dallman, M.D. Carroll, E.W. Gunter and C.L. Johnson, 1997. Prevalence of iron deficiency in the United States. *JAMA.*, 277:973–976.
13. Alice, C.Y. and G.D. Katherine, 1987. Prevalence of iron deficiency among Chinese children aged 6 to 36 months in Montreal. *Clin Med Am J.*, 136:373–378.
14. Hall, A., E. Bobrow and S. Brooker, 2001. Anemia in schoolchildren in eight countries in Africa and Asia. *Public Health Nutr.*, 4:749–756.
15. World Health Organization, 1992. *Prevalence of anemia in women*. Geneva, Switzerland: WHO.
16. World Health Organization, 1996. *Guidelines for the control of iron deficiency in countries of the Eastern Mediterranean, Middle East and North Africa*. Alexandria: World Health Organization Regional Office for the Eastern Mediterranean; WHO-EM/NUT/177, E/G/11.96.
17. Hercberg, S., P. Preziosi and P. Galan, 2001. Iron deficiency in Europe. *Publ Health Nutr.*, 4:537–545.
18. Dura Trave, T. and L. Diaz Velaz, 2002. Prevalence of iron deficiency in healthy 12 month–old infants. *An Esp Pediatr.*, 57:209–214.
19. Lawson, M.S., M. Thomas and A. Hardiman, 1998. Iron status of Asian children aged 2 years living in England. *Arch Dis Child.*, 78:420–426.
20. Freeman, V.E., J. Mulder, M.A. Van't Hof, H.M. Hoey and M.J. Gibney, 1998. A longitudinal study of iron status in children at 12, 24, and 36 months. *Publ Health Nutr.*, 1:93–100.
21. M. abdolaliyan, 2009. 1th edition, I'm with my babe (1-3years old). Health care, moiin publications, pp: 165-180
22. Ali, N.S. and R.W. Zuberi, 2001. The relationship of socio–demographic factors with iron deficiency anaemia in children of 1–2 years of age. *J Pak Med Assoc.*, 51:130–132.
23. Watt R.G., Dykes J. and A. Sheiham, 2001. Socio–economic determinants of selected dietary indicators in British pre–school children. *Public Health Nutr.*, 4:1229–1233.
24. Melse–Boonstra, A., S. Pee, E. Martini, S. Halati, M. Sari and S. Kosen, 2000. The potential of various foods to serve as a carrier for micronutrient fortification, data from remote areas in Indonesia. *Eur J Clin Nutr.*, 54:822–827.

25. Schneider, J.M., M.L. Fujii, C.L. Lamp, B. Lönnerdal, K.G. Dewey and S. Zidenberg-Cherr, 2005. Anemia, iron deficiency, and iron deficiency anemia in 12–36–mo–old children from low–income families. *Am J Clin Nutr.*, 82:1269–1275.
 26. Kohli-Kumar, M., 2001. Screening for anemia in children. *Pediatr.*, 108:56–59.
 27. Musaiger, A.O., 1990. Nutritional status of mothers and children in the Arab Gulf countries. *Health Promotion International.*, 5:159–268.
 28. Kazal, L.A., 2002. Jr Prevention of iron deficiency in infants and toddlers. *Am Fam Physician.*, 66:1217–1224.
 29. Lozoff, B., A.W. Wolf and E. Jimenez, 1996. Iron–deficiency anemia and infant development: effects of extended oral iron therapy. *J Pediatr.*, 129:382–389.
- Donald H Mahoney, 2001, *Iron Deficiency in infant and young children.*