

Clinical profile of iron deficiency anemia in children from 6 months to 12 months of age

DR ARJUN JAISWAL¹, DR ASHISH VERMA²

Abstract: Background: Understanding the iron stores, would help us understand iron deficiency anemia better and help us combat with the associated comorbid conditions. **Objectives:** to assess severity of anemia, to find out iron deficiency anemia is associated with which factors, to correlate other associated comorbid conditions. **Methodology:** a prospective observational study which will be conducted in avbrhospital on 75 patients. sample will be collected from IPD admissions in department of pediatrics. **Results:** after appropriate analysis with expect to assess iron deficiency anemia and its severity in children, factors causing iron deficiency anemia and correlate it with other comorbid condition. **Conclusion:** in this study we expect to observe profoundness of iron deficiency anemia in children with age group 6 months to 12 months of age. we also expect to see a positive association between anemia and weaning supplementary diet, we expect to find correlation of the anemia with other comorbid condition and also expect study to highlight clinical profile of children with IDA in this region.

Keywords: Iron Deficiency, Serum Ferritin

I. Introduction

In the developing countries as well as developed countries millions of people are affected by iron deficiency anemia, it is usually seen in children who are young, women who are pregnant and women of child bearing age. One of the major health problem in India is iron deficiency anemia, it has major adverse effects on the development of the children⁽¹⁾.

According to WHO preschool-aged children of India has highest prevalence of iron deficiency anemia. As majority of India is rural population anemia is more prevalent in India⁽²⁾. The prevalence of anemia in India is increasing at a very rapid pace in children aged 6 to 36 months⁽³⁾. Iron Deficient Anaemia (IDA) is the most common type of anemia.

It is caused by the lack of dietary iron or insufficient uptake of iron⁽⁴⁾.

There are many conditions are associated with anemia, including

- Infectious diseases
- Nutritional deficiency
- Absorptional deficiency
- Genetic mutations like transferrin (TF) (TFR1 and TFR2), matriptase (TMPRSS6).⁽⁵⁾

¹ Designation- Junior Resident , Department Pediatrics , Jawaharlal Nehru Medical Sciences, Datta Meghe Institute of Medical Sciences, Wardha , Email arjun.arjaiswal@gmail.com , Mob. No 9096918109

² Designation- Associate Professor , Department- Pediatrics , Jawaharlal Nehru Medical Sciences, Datta Meghe Institute of Medical Sciences, Wardha, Email-avarma2055@gmail.com , Mob. No.9860500063

II. BACKGROUND-

IDA is more prevalent in children of age group 6 months to 12 months. serum ferritin help to diagnose iron deficiency anemia. which help us to manage it accordingly.

Objectives:

To assess severity of anemia

To find out factors associated with iron deficiency anemia

To correlate other associated co morbid conditions

Method:

Study Design : Observational Prospective Study

Setting: The Study Will Be Conducted At Department Of Paediatrics , Jnmc, And Avbrh , Sawangi (M), Data Will Be Collected In Between 2019 To 2021.

PARTICIPANTS

Inclusion criteria

Patients Admitted From 6 Months To 12 Months Diagnosed With Iron Deficiency Anemia And Hb Less Than 11 gm/dl Will Be Included In Study.

Lower limits for haemoglobin and hematocrit values specified by World Health organisation by age and gender		
Groups by age and gender	Haemoglobin (gm/dl)	Hematocrit %
Children aged between 6 to 59 months	11	33

Exclusion criteria

1) patient who are already on iron supplementation

These children will be enrolled and there detailed history , examination , investigations and clinical profile will be entered into proforma .

Iron deficiency anemia will be diagnosed by treating paediatrician before inclusion. The diagnosis will be based on history, signs like pallor and investigations. The investigation include namely haemoglobin , mcv, mchc, mch, rdw, peripheral smear , serum iron level , tbc , serum ferritin.

Variables:

Hemoglobin levels less than 11.

Mcv less than 80.

Hematocrit less than 33.

Serum ferritin levels below 7 ng/dl.

Data sources/ measurement :

Serum hb levels

Mcv levels

Hematocrit levels

Serum ferritin levels

All the test will be done at Central Clinical Laboratory, Acharya Vinoba Bhave Rural Hospital, Wardha.

Study size: 75

Statistical methods:

All the data will be entered in excel sheet.

The qualitative data will be analysed using chi square test or Fischer's exact test.

The quantitative analysis will be done using student -t test . The p value significance level less than 0.05 will be considered significant.

III. Expected outcomes/results:

Participants- all children admitted in dept. Of paediatric in AVBRH of age group 6 months to 12 months of age and has Hb less than 11 gm/dl except the patient who are already on iron supplements.

Outcome data: serum ferritin help us to diagnose and monitor iron deficiency anaemia in children from 6 months to 12 months of age group before it leads to further co morbid conditions.

Main results: quantitative and qualitative analysis is done and values of results are compared with standard.

Discussion:

A number of articles on related aspects of this study were reviewed ⁽⁵⁻⁶³⁾. This study will give profoundness of iron deficiency anaemia in children with age group 6 months to 12 months of age, a positive association between anaemia and weaning supplementary diet, find correlation of the anaemia with other co morbid condition and highlights clinical profile of children with iron deficiency anaemia in this region.

IV. References

1. Who. Iron Deficiency Anemia: Assessment, Prevention, And Control. A Guide For Programme Managers. Geneva, World Health Organization. 2001.
2. Kanchana Et Al International Journal Of Contemporary Pediatrics. Int J Contemp Pediatr. 2018 Mar;5(2):499-502
3. Benoist B, Mclean E, Egli I, Cogswell. Worldwide Prevalence Of Anemia 1993-2005. Eds. Geneva, Switzerland: World Health Organization; 2008.
4. International Institute For Population Sciences And Macro International. National Family Health Survey (Nfhs-3), 2005-2006: Key Findings. Mumbai, India: International Institute For Population Sciences; 2007.
5. Lozoff B, Jemenez E, Wolf AW. Long Term Developmental Outcome Of Infants With Iron Deficiency. New Eng J Med. 1991;325:687-94
6. Saurabh Kumar Gupta, Deepak Bansal, Prahbjot Malhi, Reena Das. "Developmental Profile In Children With Iron Deficiency Anemia And Its Changes After Therapeutic Iron Supplementation" , The Indian Journal Of Pediatrics, 2010
7. Vidya P Paranjape. "Study Of Prevalence Of Iron Deficiency Of Anemia In School Going Children In Rural India" , Journal Of Evolution Of Medical And Dental Sciences, 2014

8. L. Siu, On Behalf Of The Us Preventive Services Task Force, Screening For Iron Deficiency Anemia In Young Children: Uspstf Recommendation Statement Albert.
9. Julie M Schneider, Mary L Fujii, Catherine L Lamp, Bo Lönnerdal, Kathryn G Dewey, Sheri Zidenberg-Cherr Anemia, Iron Deficiency, And Iron Deficiency Anemia In 12–36-Mo-Old Children From Low-Income Families1 *The American Journal Of Clinical Nutrition*, Volume 82, Issue 6, December 2005
10. Maureen M Black, Anna M Quigg, Kristen M Hurley, Margery Reese Pepper; Iron Deficiency And Iron-Deficiency Anemia In The First Two Years Of Life: Strategies To Prevent Loss Of Developmental Potential *Nutrition Reviews*, Volume 69, Issue Suppl_1, 1 November 2011
11. Richard F. Hurrell, Ph D, Preventing Iron Deficiency Through Food Fortification *Nutrition Reviews*, Volume 55, Issue 6, June 1997
12. I W Booth, M A Aukett, Iron Deficiency Anaemia In Infancy And Early Childhood, *Archives Of Disease In Childhood* 1997;76:549–554
13. C Hershko, D Bar-Or, Y Gaziel, E Naparstek, A M Konijn, N Grossowicz, N Kaufman, G Izak; Diagnosis Of Iron Deficiency Anemia In A Rural Population Of Children. Relative Usefulness Of Serum Ferritin, Red Cell Protoporphyrin, Red Cell Indices, And Transferrin Saturation Determinations, *The American Journal Of Clinical Nutrition*, Volume 34, Issue 8, August 1981.
14. Mishra KK, Kelkar P, Kumar K. An interesting case of trichotillomania in a pre-school child. *J Indian Assoc Child Adolesc Ment Health* 2018;14(4):131-135.
15. Sthapak E, Gajbe U, Singh BR. Study of communication between musculocutaneous and median nerves in man. *J Anat Soc India* 2018;67:S37-S44.
16. Tripathi A, Avasthi A, Grover S, Sharma E, Lakdawala BM, Thirunavukarasu M, et al. Gender differences in obsessive-compulsive disorder: Findings from a multicentric study from northern India. *Asian J Psychiatry* 2018;37:3-9.
17. Yeola ME, Gode D, Bora AK. Evaluation of abdominal malignancies by minimal access surgery: Our experience in a rural setup in central India. *World J Laparoscopic Surg* 2018;11(3):115-120.
18. Balwani M, Bawankule C, Ramteke V, Pasari A. Hepatitis C virus, directly acting antivirals and Guillain-Barré syndrome. *Saudi J Kidney Dis Transpl* 2018;29(5):1237-1239.
19. Balwani MR, Pasari A, Meshram A, Jawahirani A, Tolani P, Laharwani H, et al. An initial evaluation of hypokalemia turned out distal renal tubular acidosis secondary to parathyroid adenoma. *Saudi J Kidney Dis Transpl* 2018;29(5):1216-1219.
20. Goyal RC, Choudhari SG, Tankhiwale SR. Assessment of competency based medical internship training with ‘cumulative grade points average system’-An innovative step towards meeting ‘vision 2015’ of medical council of india. *Indian J Public Health Res Dev* 2018;9(8):155-162.
21. Yeola ME, Gode D, Bora AK. Diagnostic laparoscopy as an effective tool in evaluation of intra-abdominal malignancies. *World J Laparoscopic Surg* 2018;11(2):68-75.
22. Sharma S, Singh AD, Sharma SK, Tripathi M, Das CJ, Kumar R. Gallium-68 DOTA-NOC PET/CT as an alternate predictor of disease activity in sarcoidosis. *Nucl Med Commun* 2018;39(8):768-778.

23. Daigavane S, Prasad M. To observe the proportion of amblyopia among children presenting in a rural hospital in Central India. *J Datta Meghe Inst Med Sci Univ* 2018;13(3):119-121.
24. Gadge A, Acharya N, Shukla S, Phatak S. Comparative study of transvaginal sonography and hysteroscopy for the detection of endometrial lesions in women with abnormal uterine bleeding in perimenopausal age group. *J SAFOG* 2018;10(3):155-160.
25. Anjankar SD. Urethral protrusion of the distal end of shunt. *J Pediatr Neurosci* 2018;13(3):371-372.
26. Swarnkar M, Pandey P. Heterotopic subserosal pancreatic tissue in jejunum. *Formosan J Surg* 2018;51(4):167-170.
27. Choudhari MS, Sonkusale MI, Deshpande RA. Sudden cardiac arrest on 5 th day after coronary artery bypass graft surgery: Diagnostic dilemma. *Ann Card Anaesth* 2018;21(3):341-342.
28. Kirnake V, Arora A, Sharma P, Goyal M, Chawlani R, Toshniwal J, et al. Non-invasive aspartate aminotransferase to platelet ratio index correlates well with invasive hepatic venous pressure gradient in cirrhosis. *Indian J Gastroenterol* 2018;37(4):335-341.
29. Kürhade G, Nayak BS, Kurhade A, Unakal C, Kurhade K. Effect of martial arts training on IL-6 and other immunological parameters among Trinidadian subjects. *J Sports Med Phys Fitness* 2018;58(7-8):1110-1115.
30. Balwani MR, Bawankule C, Khetan P, Ramteke V, Tolani P, Kute V. An uncommon cause of rapidly progressive renal failure in a lupus patient: Pauci-immune crescentic glomerulonephritis. *Saudi J Kidney Dis Transpl* 2018;29(4):989-992.
31. Mohite D, Hande A, Gupta R, Chaudhary M, Mohite P, Patil S, et al. Immunohistochemical evaluation of expression pattern of p53, p63, and p73 in epithelial dysplasia. *J Datta Meghe Inst Med Sci Univ* 2018;13(3):122-129.
32. Rathi N, Chandak M, Mude G. Comparative evaluation of dentinal caries in restored cavity prepared by galvanic and sintered burs. *Contemp Clin Dent* 2018;9(5):S23-S27.
33. Gupta V, Bhake A. Reactive Lymphoid Hyperplasia or Tubercular Lymphadenitis: Can Real-Time PCR on Fine-Needle Aspirates Help Physicians in Concluding the Diagnosis? *Acta Cytol* 2018;62(3):204-208.
34. Zodpey S, Sharma A, Zahiruddin QS, Gaidhane A, Shrikhande S. Allopathic Doctors in India: Estimates, Norms and Projections. *J Health Manage* 2018;20(2):151-163.
35. Yadav S, Agrawal M, Hariharan C, Dewani D, Vadera K, Krishna N. A comparative study of serum lipid profile of women with preeclampsia and normotensive pregnancy. *J Datta Meghe Inst Med Sci Univ* 2018;13(2):83-86.
36. Bhinder HHPS, Kamble TK. The study of carotid intima-media thickness in prediabetes and its correlation with cardiovascular risk factors. *J Datta Meghe Inst Med Sci Univ* 2018;13(2):79-82.
37. Munjal R, Mudey G. Nasal carriage of *Staphylococcus aureus* among undergraduate medical students: Prevalence and antibiogram including methicillin resistance, inducible clindamycin resistance, and high-level mupirocin resistance. *J Datta Meghe Inst Med Sci Univ* 2018;13(2):91-94.
38. Mittal V, Jagzape T, Sachdeva P. Care seeking behaviour of families for their sick infants and factors impeding to their early care seeking in rural part of central India. *J Clin Diagn Res* 2018;12(4):SC08-SC12.
39. Choudhary S, Tarafdar P, Jawade S, Singh A. A point to note in pili torti. *Int J Trichology* 2018;10(2):95-97.

40. Madke B, Gardner JM. Enhanced worldwide dermatology-pathology interaction via Facebook, Twitter, and other social media platforms. *Am J Dermatopathol* 2018;40(3):168-172.
41. Girish M, Rawekar A, Jose S, Chaudhari U, Nanoti G. Utility of Low Fidelity Manikins for Learning High Quality Chest Compressions. *Indian J Pediatr* 2018;85(3):184-188.
42. Goswami J, Balwani MR, Kute V, Gumber M, Patel M, Godhani U. Scoring systems and outcome of chronic kidney disease patients admitted in intensive care units. *Saudi J Kidney Dis Transpl* 2018;29(2):310-317.
43. Mohite PM, Anjankar AJ, Patnod S. Organo PHOSPHORUS pOISONING: Prognostic value of GCS score and other clinical indicators in assessing the final outcome. *J Indian Acad Forensic Med* 2018;40(2):197-205.
44. Mathur K, Ninave S, Patond S, Ninave S, Wankhade P. A comparative study of estimation of stature by Bertillon's system among individuals of different regions of India. *J Indian Acad Forensic Med* 2018;40(3):301-306.
45. Kumar S, Bhayani P, Hathi D, Bhagwati J. Hyponatremia initial presenting feature of normal pressure hydrocephalus in elderly patient: A rare case report. *J Gerontology Geriatrics* 2018;66(3):156-157.
46. Jaiswal S, Banait S, Daigavane S. A comparative study on peripapillary retinal nerve fiber layer thickness in patients with iron-deficiency anemia to normal population. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):9-11.
47. Deshpande P, Gupta V, Bhake A. Methylation pattern of retrotransposons: Biomarker for human cancer. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):66-70.
48. Deshpande S, Phatak S, Marfani G, Gupta N, Daga S, Samad S. Sonographic evaluation of painful shoulder and its comparison with clinical diagnosis. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):12-15.
49. Singh P, Jain S, Methwani D, Kalambe S, Chandravanshi D, Gaurkar S, et al. Study of correlation of pre-operative findings with intra-operative ossicular status in patients with chronic otitis media. *Iran J Otorhinolaryngol* 2018;30(5):273-281.
50. Papalkar P, Kumar S, Agrawal S, Raisinghani N, Marfani G, Mishra A. Heterotaxy syndrome presenting as severe pulmonary artery hypertension in a young old female: Case report. *J Gerontology Geriatrics* 2018;66(2):59-61.
51. Rawlani SM, Bhowate R, Kashikar S, Khubchandani M, Rawlani S, Chandak R. Morphological evaluation of temporo-mandibular joint in Indian population. *Braz Dent Sci* 2018;21(1):44-53.
52. Modi L, Gedam SR, Shivji IA, Babar V, Patil PS. Comparison of total self-stigma between schizophrenia and alcohol dependence patients. *Int J High Risk Behav Addict* 2018;7(3).
53. Rajan R, Gosavi SN, Dhakate V, Ninave S. A comparative study of equipotent doses of intrathecal clonidine and dexmedetomidine on characteristics of bupivacaine spinal anesthesia. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):4-8.
54. Rajan R, Gosavi S, Dhakate V, Ninave S. A comparative study of equipotent doses of intrathecal clonidine and dexmedetomidine on characteristics of bupivacaine spinal anesthesia. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):4-8.
55. Phatak S, Marfani G. Galactocele ultrasonography and elastography imaging with pathological correlation. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):1-3.

56. Swarnkar M, Agrawal A. Kimura's disease. *Formosan J Surg* 2018;51(1):26-28.
57. Chiwhane A, Pradeep. Study of rhythm disturbances in acute myocardial infarction. *J Assoc Phys India* 2018;66(January):54-58.
58. Gupta V, Bhake A. Assessment of Clinically Suspected Tubercular Lymphadenopathy by Real-Time PCR Compared to Non-Molecular Methods on Lymph Node Aspirates. *Acta Cytol* 2018;62(1):4-11.
59. Anjankar S. Askin's tumor in adult: A rare clinical entity. *J Datta Meghe Inst Med Sci Univ* 2018;13(1):54-57.
60. Jain J, Banait S, Tiewsoh I, Choudhari M. Kikuchi's disease (histiocytic necrotizing lymphadenitis): A rare presentation with acute kidney injury, peripheral neuropathy, and aseptic meningitis with cutaneous involvement. *Indian J Pathol Microbiol* 2018;61(1):113-115.
61. Jain V, Waghmare L, Shrivastav T, Mahakalkar C. SNAPPS facilitates clinical reasoning in outpatient settings. *Educ Health* 2018;31(1):59-60.
62. Bains SK, John P, Nair D, Acharya S, Shukla S, Acharya N. Aptitude of medical research in undergraduate students of a medical university - Miles to go before we sow. *J Clin Diagn Res* 2017;11(12):JC07-JC11.
63. Taksande A, Meshram R, Yadav P, Lohakare A. Rare presentation of cerebral venous sinus thrombosis in a child. *J Pediatr Neurosci* 2017;12(4):389-392.