



Case Report

The Classic Dermatological Signs of Iron Deficiency: A Case-Series

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Abstract

Introduction: Anaemia is defined as a decrease in the total amount of RBCs or haemoglobin in the blood. Anaemia patients show skin signs like pallor, koilonychia, and hair loss. **Aim:** The aim of the study is to find the cause of typical rash and confirm the diagnosis. **Materials/Methods:** This retrospective study involves collection of 26 patients showing typical skin lesions. All subjects involved in this study are categorized according to age, sex, type of lesions and site involved. All were investigated for hematological parameters mainly haemoglobin (Hb), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH). Everyone was showing reduced parameters with microcytic hypochromic red blood cells suggesting iron deficiency anaemia. These patients were further investigated for other causes of anaemia and diagnosis was confirmed by serum iron levels, total iron binding capacity, serum ferritin and transferrin saturation. Other causes like zinc deficiency, pellagra, contact dermatitis were also ruled out. **Results:** Almost all patients are females except two males. Majority of them are young females. The skin lesions can present isolated on face or hands or both sites. Each and every subject is confirmed to have iron deficiency anemia. **Limitations:** This is a single center study. **Conclusion:** These typical eczematous hand and perioral lesions were highlighting the importance of looking for iron deficiency in affected patients without a more obvious cause.

Keywords

Iron Deficiency Anaemia, Eczema, Cutaneous Marker

1. Background

Anaemia is usually defined as a decrease in the total amount of RBCs, haemoglobin or haematocrit values in the blood [1, 2]. In India almost, quarter of population suffers from anaemia. There are various types of anaemia like megaloblastic anaemia, pernicious anaemia, iron deficiency anaemia, haemorrhagic anaemia, haemolytic anaemia and aplastic anaemia. Iron deficiency is one of the causes of anaemia. Literature mentions pallor, koilonychia, angular cheilitis and hair loss as signs of anaemia [3, 9]. Here I have reported 26 cases having typical skin rash signaling iron deficiency anaemia which is not mentioned in the literature.

2. Objective

The aim of the study is to find the cause of typical rash and confirm the diagnosis which is not mentioned anywhere in literature.

3. Methods

In this case series study, 26 patients showing similar skin lesions are involved.

Case 1: One of my initial patients, a 27 years female who presented with reddish well demarcated lesions over hands since last few days (Figure 1). Clinically the lesions were

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asymptomatic, superficial, hyperkeratotic, well demarcated and crust like patches. They were erythematous to brownish in colour. It was distributed over dorsum of hands. There was no history like contact dermatitis or any systemic disease. On examination no other significant skin lesion or systemic finding noted. Pallor was significantly noticed. On investigations she was found to have severe iron deficiency anaemia.



Figure 1. Erythematous superficial crusted lesion on the hand.

Case 2: A 64 years old lady presented for perioral rash (**Figure 2**). She complained of asymptomatic skin rash developed near mouth for 15 days. No specific history like contact, application, medication reported. No history of major illness. On examination angry red well demarcated patch present near angle of mouth. Koilonychia was noticed on examination. On investigations severe drop in haemoglobin found.



Figure 2. Eczematous lesion in perioral area.

Case 3: A 32 years lady visited for rash over hands. On examination there was dusky brownish sharply demarcated patches over dorsum of hands extending from thumb and index finger. There were also crusted patches on lower lips near angle of mouth. Other noticeable signs like pallor and periorbital pigmentation also present. On investigations her haemoglobin was 6.5gm%. She was treated for iron deficiency anaemia. After around 2 months hand lesions were completely resolved (**Figure 4**).



Figure 3. Pre treatment.



Figure 4. Post treatment.

Case 4: 24 years girl came with complaints of superficial crusted lesions over dorsum of hands mainly thumb and index finger. Also, such lesions noticed on knuckles. She was treated with injectable and oral iron. After 8- 10 weeks the lesions resolved.



Figure 5. Pre Treatment.



Figure 6. Post Treatment.

4. Results

All 26 patients were investigated for haematological parameters [12, 13] mainly haemoglobin (Hb), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) [8].

All of them have reduced Hb, MCV, MCHC (see table) [7]. All subjects were showing microcytic hypochromic red blood cells suggesting iron deficiency anaemia. These patients were further investigated for other causes of anaemia and diagnosis was confirmed (see table) by serum iron levels, total iron binding capacity, serum ferritin and transferrin saturation [8].

Table 1. Haematological parameters.

Index	HB gm%	RBC 3.8-5.3	WBC	HCT 36-56	MCV80-100	MCH27-32	MCHC32-36	PLT120-380	RDW10-16
1	6.8		4.3	23.2	59.8	17.5	29.3	1.65	
2	8.3	4.16	6.5	24.1	57.9	20	34.4	333	16.6
3	9.3	4.69	8.5	27.1	57.8	19.8	34.3	329	15.7
4	6.1	4.22	7.5	20.6	48.8	14.5	29.6	357	16.8
5	6.3	4.17	5	21.4	51.3	15.1	29.4	304	17.1
6	7.3	3.84	9.7	23	59.9	19	31.7	352	16
7	5.7	3.84	6.3	20.5	53.4	14.8	27.8	453	18.3
8	5.9	4.42	9.3	20.7	46.8	13.3	28.5	414	18
9	8	4.39	4.8	25.1	57.2	18.2	31.9	425	15.5
10	6.1	4.02	7.2	20.1	50	15.2	30.3	279	20.2
11	6.6	4.7	6	20.4	50.1	16.2	32.4	491	17.2
12	7.7	4.14	6.1	22.9	53.3	18.6	33.6	360	17.5
13	8.6	4.37	8.9	24.1	55.1	19.5	35.3	474	16.3
14	7.2	3.79	7.2	21.8	57.5	18.7	32.6	359	15.6
15	5.6	4.04	8.8	21.8	54	13.9	25.7	390	16.8
16	8.1	4.7	6.4	26.6	56.6	17.2	30.5	138	16.8
17	7.7	5.07	6.6	27.2	53.6	15.2	28.3	329	16.3
18	4.3	3.23	3.1	18.1	56	13.3	23.8	409	15.7
19	6.5	4.16	4	23.4	56	15.7	27.8	325	18.7
20	3.7	2.64	7.7	24.1	53	13.9	26	361	18.5
21	6.4	4.85	12.5	21.9	45.3	13.1	29.2	344	24
22	5.3	4.1	7	20.9	50.9	12.9	25.4	394	20.4
23	6.5	5.28	12700	23.7	44.9	12.3	27.4	443	20.8
24	8.3	3.95	7100	24.2	61.1	20.9	34.3	399	
25	6.5	4.29	4400	27.4	63.87	15.15	23.72	429	19.3
26	7.4	4.69	9100	27.6	58.8	15.8	26.8	262	14.2

Index	PCT.1-1	MPV5-10	PDW12-18	sr iron60-150	TIBC250-400	SR FERRITIN15-230	TRANSFERRIN SATURATION20-50%
1							
2	0.18	5.4	15.5				

Index	PCT.1-1	MPV5-10	PDW12-18	sr iron60-150	TIBC250-400	SR FERRITIN15-230	TRANSFERRIN SATURATION20-50%
3	0.14	4.3	16.4				
4	0.21	5.9	15.1				
5	0.18	6	15.9	15	466	2.9	3
6	0.17	4.8	17.3				
7	0.2	4.5	15				
8	0.22	5.4	14.8	32	352	1.02	9.09
9	0.22	5.2	17.4	15	502	2.4	3
10	0.18	6.3	15.2	13.8	579.73	2.7	2.38
11	0.22	4.4	16.5				
12	0.13	3.6	17.5				
13	0.24	5	16.7				
14	0.13	3.5	19				
15	0.2	5	14.7				
16	0.11	5.7	15.1				
17	0.14						
18	0.4	10	25				
19	0.325	8.6	17.4				
20	0.278	7.7	14				
21	0.25		10.8				
22	0.32	8.2	15.4				
23	0.39	8.8	13.6				
24							
25				zinc -178.9 (54-151)			
26							

Legends in the [Table 1](#): Hb, MCV, MCHC, Sr Iron, Sr Transferitin saturation reduced, TIBC Increased.

5. Discussion

Such eczematous dry crusted rash over dorsum of hands and perioral area should be differentiated from zinc deficiency, pellagra, photodermatitis, contact dermatitis and other causes.

There was no history suggestive of contact dermatitis in all cases.

Zinc deficiency and anemia are related but different condition. Anemia is a broad condition (low red blood cells/hemoglobin) often from iron lack, while zinc deficiency is a lack of the mineral zinc, which is vital for making red blood cells, so zinc deficiency can cause or worsen anemia, often alongside iron deficiency, impacting immunity, growth, and overall health, with symptoms like fatigue, skin issues, and impaired

taste/smell. They frequently appear together, especially in children and pregnant women, as iron and zinc are often found in the same foods. Zinc deficiency alone might not cause anemia but can cooperate with other factors (like inflammation or other nutrient gaps) [14]. Considering this serum zinc level was tested in few patients initially which were normal.

Even though the rash appears clinically somewhat similar to pellagra but other signs like diarrhoea, dementia are absent. Cassle neck, stomatitis like skin signs are not seen in these patients. Extensive studies limited to the anaemia of endemic pellagra were made in 1923 by Huck [15] and in 1933 by Turner [16]. These investigations observed that anaemia did not occur frequently in this type of pellagra. All patients in this study were nonalcoholic and their diet habits were not suggestive of niacin deficiency.

Iron deficiency anemia is defined as anemia due to lack of

iron. It is mainly caused by parasitic infections, blood loss, pregnancy and dietary deficiency. It shows sign/symptoms like Pica, Fatigue, Lack of concentration, Koilonychias, Pallor, Loss of papillae of tongue [9]. Iron deficiency anaemia is common in females that might be the reason of female preponderance.

Diagnostic criteria include [5, 10]:

- 1) Microcytic, hypochromic Red blood cells (RBCs)
- 2) Low mean corpuscular volume (MCV) [11]

- 3) Low mean corpuscular hemoglobin concentration (MCHC)
- 4) Elevated platelet count in many cases
- 5) Normal or elevated white blood cell count
- 6) Low Sr iron, ferritin levels [4], and high total iron binding capacity (TIBC) level

Microcytic anemia resulting from other causes like Thalassemia, Anemia of chronic cause, Sideroblastic anaemia [14] and Lead poisoning were ruled out (see Table 2).

Table 2. Differentiates other causes of microcytic anemia.

MARKERS	IRON DEFICIENCY ANAEMIA	B-THALASEMIA	CHRONIC CAUSE
MCV/RBC	>13	<13	
RDW	INCREASED	NORMAL	
SR IRON	DECREASED	NORMAL	DECREASED
FERRITIN	DECREASED	NORMAL	INCREASED NORMAL
FEP	INCREASED	NORMAL	
MCHC	DECREASED		
PLATELET COUNT	INCREASED		
TARGET CELLS	ABSENT	PRESENT	
TIBC	INCREASED	NORMAL	DECREASED
THERAPEUTIC TEST WITH ORAL IRON	RISE IN HB	NO RISE IN HB	NO RISE

Management consists of oral or parenteral iron preparation [6]. Oral supplementation of iron is by far the most common method of iron repletion. The dose of iron administered depends on the patient's age, calculated iron deficit, the rate of correction required, and the ability to tolerate side effects. The most common side effects include metallic taste and gastrointestinal side effects such as constipation and black tarry stools. For such individuals, they are advised to take oral iron every other day, in order to aid in improved GI absorption. The hemoglobin will usually normalize in 6-8 weeks, with an increase in reticulocyte count in just 7-10 days. IV iron may be beneficial in patients requiring a rapid increase in levels. Patients with acute and ongoing blood loss or patients with intolerable side effects are candidates for IV iron. Iron rich food like meat, eggs, green leafy vegetables, legumes is suggested. Tea and coffee prohibited because it inhibits absorption when consumed with meal or shortly after meal. Vit C is powerful enhancer of iron absorption from nonmeat foods when consumed with a meal [7].

6. Summary

Anemia and skin diseases are both common and it is to be expected that this will be a chance association, but in others it

will be the result of special relationship. We do not intend to give an amount of all situations in which such skin lesions and anemia are associated, but merely to consider them is important. This highlights the importance of looking for iron deficiency in affected patients without a more obvious cause.

7. Conclusion

All patients showing erythematous superficially crusted asymptomatic patches. In perioral area they are starting from angle of mouth and on dorsum of hands extending from thumb to index finger and knuckles (Figures 1, 2). All patients were confirmed to have iron deficiency anaemia and they responded to the treatment. The rash disappeared after correction of anaemia. Few interesting observations like females are more prone than males (9:1). Young females in age group 16-30 are predominantly affected. Distribution of lesions over perioral area, dorsum of hands and or both is almost equal.

Abbreviations

Vit Vitamin

Author Contributions

Bhokare Anil Balkrishna: Conceptualization, Investigation, Writing – original draf, Writing – review & editing

Conflicts of Interest

The author declares no conflicts of interest.

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