Prevalence of Anaemia in postmenopausal women of Kunjrao village, Anand district: A case study

| Binita T. Patel | - | Asst.Professor, B. N. Patel Institute of Paramedical and Science, Sardar Patel University, Anand, Gujarat, India. |

| Amee P. Gandhi | - | Asst.Professor, B. N. Patel Institute of Paramedical and Science, Sardar Patel University, Anand, Gujarat, India. |

Abstract: The aim of this study is to analyse haematological parameters and check the prevalence of anaemia in postmenopausal women. Anaemia is defined as a clinical abnormality characterized by a reduction in haemoglobin concentration below the normal range. It can be of different types and is commonly seen in elderly aged women. A cross sectional study was carried out for 47 postmenopausal women in a rural area of Anand district in a camp. Questionnaire study was made to know the previous history, and it also includes the subject's dietary habits. RBC indices and peripheral smear examination was carried out to diagnose different types of anaemia.

Keywords Anaemia, Menopause, Hematological parameters, Nutrition.

Introduction:

The World Health Organization has defined anaemia in women as hemoglobin concentration less than 12.0mg/dl. Etiologically anaemia is divided into three types that is, Hemolytic anaemia (Normocytic Anaemia), Megaloblastic Anaemia (Macrocytic Anaemia) and Iron Deficiency anaemia (Microcytic Anaemia).

Third National Health and Nutritional Examination Survey (NHANES – III) of WHO studies revealed prevalence of anaemia as 11% in men and 10.2% in women aged 65 years and older. A study done in 2005 reveals that the prevalence of anaemia is greater in women than men aged <75 years, Out of which 2-5% adult men and postmenopausal women are suspected to have Iron Deficiency Anaemia (IDA); commonest cause been blood loss from gastrointestinal tract [1].Iron Deficiency Anaemia is characterized by defect in Hemoglobin synthesis resulting in Red Blood Cells that are abnormally small (Microcytic) and contain decreased amount of Hemoglobin. Deficiencies of Vitamin –B12 and folic acid are known to cause Megaloblastic Anaemia (MA) which is characterized by presence of precursor cells, macrocytic RBC in peripheral blood. These megaloblasts arise because of impaired DNA synthesis followed by in affective erythropoiesis. The term normocytosis refers to a blood condition in which Red Blood Cells are found normal in size with haemoglobization of Red Cells in the blood film. The manifestations of anaemia in older population is associated with dietary inadequacy of micro nutrients such as iron, folate, and vitamin B12, blood loss, alterations in the bioavailability of micro nutrients due to disease or medication use; renal insufficiency and other less common causes[2].Anaemia can be identified by reviewing Peripheral Blood smears and/or by automated RBC indices.

Aim and Objectives:

Aim of our study is to check the prevalence of Anemia in postmenopausal women in Kunjrao village of Anand district. The objective of present study was to evaluate all types of Anemia by observing peripheral blood smear and Red Blood Cell indices in postmenopausal women and spread awareness among lab technicians.

Materials and Methods:

It is a descriptive cross sectional selective study, among 47 postmenopausal women of rural area in Anand district suspected to have anaemia. In our study population age of postmenopausal women ranged from 38 years to 65 years. Mean age was found to be 58; the symptom analysis of subjects was done by analyzing their dietary habits, medications, etc.

2.5 ml of EDTA blood is collected by Venous puncture method. The fully automated hematology analyzers used in the laboratories, *Celltacα MEK-6410/6420 byNihon Kohden* was used for Complete Blood Count. Peripheral blood smear examination was done normally by Field's stain to observe RBC morphology.

The following hematological investigations were carried out for all subjects- Hemoglobin level, Total Erythrocyte Count, RBC indices (Mean Corpuscular Volume, Mean Corpuscular Hemoglobin, Mean Corpuscular Hemoglobin Concentration, Pack Cell Volume, and Red Cell Distribution Width), WBC count and platelet count. Peripheral blood smear examination was carried out to check for all types of Anaemia. The diagnosis of Anaemia was done by observing morphology of RBC in peripheral blood examination and comparing it with low levels of hemoglobin concentration and RBC indices.

Abbreviation
WBC – White Blood Cells
RBC – Red Blood Cells
EDTA – Ethylene Diamide Tetra Acetic acid

Results:

Hematological characteristics have been shown in Table 1, where all 47 subjects were vegetarians. Peripheral blood smear examination revealed that macrocytosis was observed in 6.3% subjects and are suspected to have megaloblastic anaemia, 10.6% subjects had Microcytic Anaemia and are suspected to have Iron Deficiency Anaemia (IDA). Majority subjects are having Normocytic Anaemia (27.6%).

Table 2 shows patients having anaemia with Mean Hemoglobin Concentration of 12.66 (7-16.5gm %), Total Erythrocyte Count of 4.65 (3.8-6.3 mili/cumm), Pack Cell Volume of 36.20 (25.3-50.3%), Mean Corpuscular Volume of 80.2 (56.3-98.2fL), Mean Corpusclar Hemoglobin of 26.20 (18-31.9%) Mean Corpuscular Hemoglobin Concentration of 30 (26.6-31.9%), Red Cell Distribution Width of 13.1 (11.1-17.0 %)

Fatigue was the most common symptom found in 78 % subjects, blurred vision was found to be common sign observed in 65.9% of subjects. 57.44% of subjects were having problem of insomnia. 21.27% of subjects were observed to have sudden weight gain, It was found that 31.91 % were on acid reducing medications.82.9% of subjects are having milk and curd in their routine diet.

Anaemia characterized on Peripheral Smear examination and concentration of Hemoglobin showed that most common type of anaemia was normocytic; we were unable to observe the lysed Red Blood Cells under the microscope, but the data suggests that 27.6% of patients are suspected to have Haemolytic Anaemia, 55.3% subjects were not anaemic as is depicted in Figure 1

Table 3 depicts >65 age group had hemoglobin levels <12 gm% and<50 and >65 age group had RBC counts < 4.2 million/cumm.

Sr.No.	Age	Hb	RBC	PCV	MCV	MCH	MCHC	RDW	WBC	Platelets
	Yrs	gm %	mili/cumm	%	fL	Pg	%	%	cells/cumm	lacs/cumm
1	65	12.20	**4.17**	37.30	89.45	29.26	32.71	12.60	7100	2.44
2	67	**10.80**	**3.84**	**33.80**	88.02	28.13	**31.94**	12.20	5700	**1.32**
3	55	**11.50**	4.43	**35.10**	**79.23**	**25.96**	32.76	13.50	6700	1.99
4	70	**11.10**	**3.97**	**34.70**	87.41	27.96	**31.99**	13.20	7700	2.09
5	70	**9.40**	**3.96**	**30.10**	**76.01**	**23.74**	**31.23**	13.70	9900	**4.27**
6	57	12.60	4.46	38.30	85.87	28.25	32.90	11.70	8100	1.70
7	43	**11.30**	**3.89**	**35.20**	90.49	29.05	32.10	12.20	8000	3.49
8	55	13.20	5.30	40.80	**76.98**	**24.98**	32.35	12.20	7200	2.66
9	68	**11.80**	4.60	**36.10**	**78.48**	**25.65**	32.69	12.00	9000	2.17
10	65	12.90	**4.17**	39.00	93.53	30.94	33.08	11.50	7700	3.08
11	52	13.10	5.09	40.80	80.16	**25.74**	32.11	12.30	8200	3.00
12	58	12.70	4.30	38.40	89.30	29.53	33.07	11.90	6200	2.55
13	70	**11.90**	4.37	37.10	84.90	27.23	32.08	12.00	5900	2.45
14	60	**11.80**	4.61	**36.80**	**79.83**	**25.60**	32.07	13.20	9400	2.14
15	69	12.60	4.56	38.70	84.87	27.63	22.56	12.10	7000	2.17
16	53	13.50	5.12	41.50	81.05	**26.37**	32.53	13.00	6700	2.42
17	58	12.70	4.44	38.80	87.39	28.60	82.73	12.40	7900	2.67
18	60	12.20	4.64	37.70	81.25	**26.29**	32.36	12.50	6600	2.19
19	55	12.00	4.20	**36.90**	87.86	28.57	32.52	11.90	6400	2.65
20	57	**10.20**	5.39	**32.90**	**61.04**	**18.92**	**31.00**	12.50	5100	2.62
21	60	13.50	4.88	41.01	84.04	27.66	32.92	12.20	10500	2.26
22	70	12.20	4.35	38.20	87.82	28.05	**31.94**	12.00	10100	2.93
23	55	**9.90**	4.44	**32.40**	**72.97**	**22.29**	**30.55**	14.30	10200	**4.05**
24	70	12.70	4.25	39.40	92.71	29.88	32.23	12.30	6500	**1.04**
25	58	12.20	5.10	40.20	**78.82**	**23.92**	**30.35**	13.50	6300	1.85
26	65	**11.60**	4.63	**36.60**	**79.05**	**25.05**	**31.69**	12.60	9100	2.33
27	60	13.60	5.23	42.10	80.50	**26.00**	32.30	11.80	6600	2.17
28	52	**16.50**	**6.11**	**50.30**	82.32	27.01	32.80	12.20	7500	**1.04**
29	65	**11.90**	4.57	37.80	82.71	**26.03**	**31.48**	12.60	5500	1.78
30	62	12.70	5.19	39.50	**76.11**	**24.47**	32.15	11.10	8500	2.08
31	64	12.30	4.74	37.80	**79.75**	**25.95**	32.54	12.00	7600	2.31
32	52	**11.20**	4.20	**35.10**	83.75	**26.67**	**31.91**	12.50	8800	2.78
33	45	13.10	4.67	40.70	87.15	28.05	32.19	12.30	9500	2.93
34	50	12.20	4.32	38.00	87.96	28.24	32.11	12.80	7400	2.56
35	57	13.10	5.06	40.70	80.43	**25.89**	32.19	11.70	**12100**	2.75
36	49	**11.60**	4.49	**36.20**	80.62	25.84	32.04	11.40	8700	2.05
37	50	**11.10**	4.42	**35.00**	**79.19**	**25.11**	**31.71**	13.00	9200	2.25
38	55	13.20	4.67	40.00	85.65	28.27	33.00	11.70	7200	3.08
39	60	12.50	4.58	38.90	84.93	27.29	32.13	11.90	9300	1.95
40	60	**11.50**	**6.38**	38.50	**60.35**	**18.03**	**29.87**	12.50	9400	2.40
41	70	12.70	4.87	39.40	80.90	**26.08**	32.23	12.00	10000	2.80
42	70	13.00	5.18	41.10	**79.34**	**25.10**	**31.63**	12.20	8300	2.20
43	49	**11.00**	**4.06**	**35.40**	87.19	27.09	**31.07**	13.50	**3500**	**1.09**
44	56	**7.00**	4.49	**25.30**	**56.35**	**15.59**	**26.67**	**17.00**	10300	**4.71**
45	38	12.30	**3.94**	38.70	**98.22**	**31.22**	**31.78**	13.30	9200	3.11
46	49	14.40	4.64	44.20	95.26	**31.03**	32.58	12.33	6900	3.02
47	70	**11.40**	5.72	**38.30**	**66.09**	**19.93**	**29.77**	**15.70**	9000	2.50

Table 1: Presenting hematological characteristics of anaemia.

Healthy subjects	Parameters	All subjects (47)	
		Mean	Reference range
	Hemoglobin (gm %)	12.66	12-16
	TotalRBC (mili/cumm)	4.65	4.2-5.4
	PCV (%)	**36.20**	37.00-47.00
	MCV (fL)	80.2	80.00-96.00
	MCH (pg)	**26.20**	27.00-31.00
	MCHC (%)	**30**	32.00-36.00
	RDW (%)	13.1	10.00-15.00

Table 2: Mean values and reference ranges of erythrocyte parameters measured in 47

Age Group	Total subjects	No. of patients having Hb below 12gm%	No. of patients having RBC below 4.2 mili/cumm
<50	06(12.7%)	03(6.3%)	03(6.3%)
50-55	08(17.0%)	03(6.3%)	00(0%)
55-60	15(31.9%)	03(6.3%)	00(0%)
60-65	07(14.8%)	04(8.5%)	02(4.2%)
>65	11(23.4%)	06(12.7%)	03(6.3%)

Table 3: Correlation of age based on hemoglobin value and RBC count
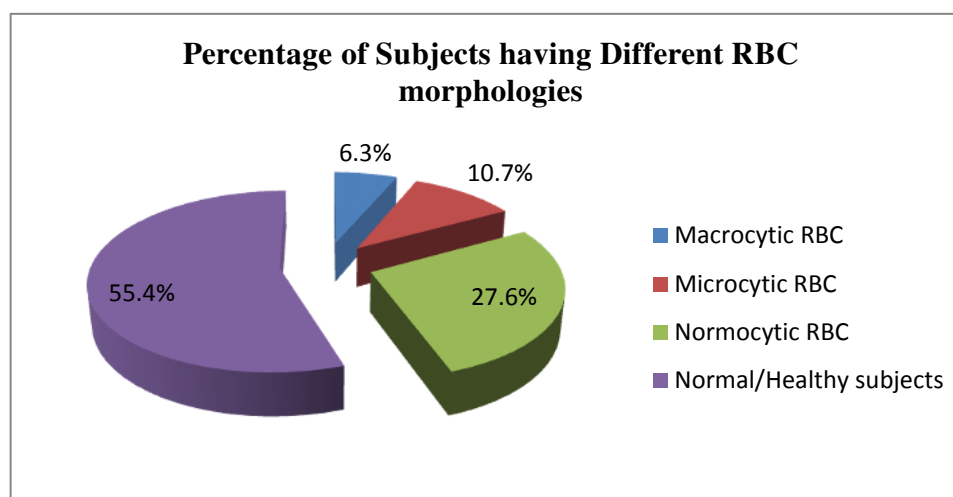
Figure 1: Anaemia characterization on Peripheral Smear findings

Discussion:

Anaemia is associated with poor physical strength and fatigue. According to NHANES III study anaemia can occur due to number of causes such as heavy blood loss, parasitic infection, low hemoglobin concentrations, micronutrient deficiencies& unexplained causes. It can affect people of various ages mostly seen in people above 65 years of age[3].It has been reported that all patients had mild(9-12 gm %) moderate(6-9gm %) or severe (<6 gm %) degree of anaemia in elderly patients, while in our study postmenopausal women had hemoglobin concentration ranging from (7-16.5gm %),

Total Erythrocyte count was found to be 3.8-6.3 mili/cumm (lowest being 3.8 and highest being 6.3) mili/cumm[4]. A study revealed that out of 100 patients 17% had normocytic normochromic anaemia, 3% had macrocytic anaemia and 61% women had microcytic anaemia. Where as in our study 6.3% women had macrocytic anaemia, 10.63% had micro cytic anaemia and 27.6% had normocytic anaemia [5].

Macrocytosis may be defined as mean corpuscular volume (MCV) above 97fL our study revealed that out of 47 subjects all had MCV below 97fL except for one having MCV 98.22fL[6]. A data also reported that high prevalence of normochromic anaemia and smaller proportion of microcytic anaemia is seen in elderly subjects (MCV= 75-82fL), which is almost similar to our study [7].It was observed in one study where all the patients were vegetarian, fatigue was the most common symptom found in 74% of patients having anaemia while in our study we had almost similar number of patients having fatigue (78%) out of which 3 of them had macrocytic anaemia, 5 had macrocytic anaemia and 13 had normocytic anaemia[8].

A study shows mild leucopenia (2.7-3.2X 10^3) and thrombocytopenia (2.6-1.35 lakh /cumm) and all 272 patients exhibited widen RDW ranging from 16.2%-36%) In our study subjects did not have thrombocytopenia and leucopenia except for one subject with WBC 3500 cells/cumm and platelet count

of 1.07 lakh cells/cumm, RDW ranges from 11.1 to 17%[9]. In 89 case studies having vitamin B12 deficiencies where 13 cases had weakness and 4 cases were observed to have insomnia while in our study 36 subjects had weakness and 26 subjects had insomnia[3]. In our study 31subjects had diabetes mellitus with anaemia. Anaemia is common finding in diabetes particularly in patients with renal impairment study done by Merlin Thomas showed that at least one in five patients with diabetes have anaemia, erythropoietin synthesis associated with tubular dysfunction appears to be the dominant factor [10].

Conclusion:

Below mentioned are the findings and conclusions for our research among 47 postmenopausal women of Kunjrao village of Anand district

1. It is been concluded that majority of postmenopausal women were healthy due to consumption of healthy nutritional diet.

2. Normocytic anaemia is most commonly found anemic condition in elderly age

3. Health awareness via television, newspaper, health check-up & awareness camps had played major impact on rural women so; deficiencies which earlier were seen are now found less.

4. Nonspecific symptoms like fatigue, blurred vision should not be ignored in the generic populations as they could be important pointers towards presence of anaemia in these postmenopausal women.

5. We will be regularly conducting such surveys in the neighborhood rural areas and will be distributing nutrition charts for such at risk females.

Reference:

1. A F Goddard, MW James, A S Mclntyre et al.. Guidelines for the Management of Iron Deficiency Anaemia. *British Society of Gastroenterology* May 2005; (): 1-8

2. Amit Bhasin - Medha Y. Rao. Characteristic of Anaemia in Elderly: A Hospital Based Study in South India. *Indian Journal Of Hematology and Transfusion Medicine* 2011; 27(1): 26-32.

3. Carmel R. Anaemia in Aging: An Over View of Clinical, Diagnostic and Biological Issues. *Blood Rev.* 2001; 15(1): 9-18.

4. C.W.J. Chan et al. Diagnostic Clues to Megaloblastic Anaemia Without Macrocytosis. *International Journal Of Laboratory Hematology* 2007; 29(): 163-171

5. Danielle R. Rusher and Roman Pawlak. A Review of 89 Published Case Studies of Vitamin B12 Deficiency. *Journal Of Human Nutrition and Food Science* 2013; 1(2): 1-12.

6. Lisa tussing-Humpherys, Carol Braunschweig. Anaemia in Postmenopausal Women: Dietoryinadequecy or Nondietory Factors?. *Journal of the American Dietic Association* 2011; 111(04): 522-531.

7. M C Savithri, K.P.Kavitha. Suparious Macrocytosis- Automated Cell Counters are not Fool-Proof. *Scholar Academic and Scientific Publisher* 2015; 03(): 376-378.

8. Merlin C. Thomas. The High Prevalance of Anaemia in Diabetes in Linked to Functional Erythropoetin Deficiency. *The Kidney and Anaemia* 2006; 26(4): 275-282.

9. Raina et al. A Clinicalhematological Profile Of Elderly Patients Being Investigated for Anaemia in a tertiary Care Centre in North - WestIndia. The Egyptian Society of Haematology 2014; (10.4103): 1110-1065.

10. Sandhya I Muhasin T.P. . Study Of RBC Histogram in Various anaemias. *Journal Of Evolution Of Medical and Dental Sciences 2014* 2014; 03(74): 15521-15534.