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A Study of Serum for Calcium and Ra Factor in Patients Undergoing Rheumatoid Arthritis

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Abstract

- ***Background*:**

A painful condition, rheumatoid arthritis frequently damages the patient's bones and joints. This autoimmune condition first affects tiny joints like the finger, thumb, toe, etc. The exact cause of the disease is unknown. These factors mostly include calcium shortage, elevated level of uric acid, poor fibre consumption, age, sex might cause arthritis. Women are more prominent to this disease as comparatively men.

- ***Aim and Objectives:***

The aim of the study was to do the comparison between different nutrient deficiencies like calcium correlating with certain joints infections by determining RA factor.

- ***Material And Methods:***

Three groups were generated from a total of 50 subjects in my research projects.29 abnormal, 14 control-normal, and 7 borderlines. The Quickem 200 Fully Auto Biochemistry Analyzer tested the patients' biochemistry by measuring their levels of calcium and RA factor. Calcium and RA factor are measured using the same Analyzer, and and the intensity of the colour is directly related to the concentration of the sample.

- ***Results:***

The results were expressed as Mean ± SD. The statistical analysis of the data was carried out with statistical package of social sciences(SPSS), version 20.0. The comparison between two groups were tested by 't' test. In severe Rheumatoid Arthritis, the mean RA factor value were observed significantly high in all Age Groups i.e. (5-20 yrs.) (21-45 yrs.) and (45 yrs. Above) in both males and females. While calcium level decreases in all age groups in both males and females.

- ***Conclusion:***

The research study demonstrated as correlative association of Calcium with Rheumatoid arthritis. So, all these given parameters should be done during the treatment of Rheumatoid Arthritis and elevated level of calcium patient gives the results regarding infection in the blood due to inadequate removal of uric acid crystals as well as deficiency of Calcium which further can result in the low bone density. The above parameters should be determined during the diagnosis of RA in a patient.

I. INTRODUCTION

Rheumatoid arthritis (RA) is a symmetrical, chronic inflammatory autoimmune disease that affects small joints first, then bigger joints, the skin, eyes, heart, kidneys, and lungs. Joint bone and cartilage are frequently damaged, and tendons and ligaments become weak. All of this joint deterioration leads to abnormalities and bone erosion, which are frequently highly painful for the patient. Morning stiffness of the afflicted joints for more than 30 minutes, exhaustion, fever, weight loss, sensitive, swollen, and heated joints, and rheumatoid nodules under the skin are all common RA symptoms.

This condition generally appears between the ages of 35 and 60, with periods of remission and aggravation. Juvenile RA (JRA), which is identical to RA but does not have rheumatoid factor, can affect young children even before they reach the age of 16. RA is thought to affect 1–2% of people in the West, and 1% of people globally (Mahajan V, Handa R, Kumar U et al. ,Assessment of atherosclerosis by carotid intimomedial thickness in patients with rheumatoid arthritis. J Assoc Physicians India 56, 587–90. (2008)

They scale back inflammation by limiting the discharge of phospholipids and lowering the activities of eosinophils. Bone weakening, weight gain, diabetes, and immunological disorder are all doable adverse effects. it's doable to avoid bone weakening by advising the patient to require metal and cholecalciferol supplements (Lawrence RC, Helmick CG, Arnett FC, Deyo RA, Felson DT, Giannini EH, Heyse SP, Hirsch R, Hochberg megacycle per second, Hunder GG, et al..). As a patient's health improves, reducing dosages will facilitate to reduce facet effects. it's vital to not stop victimization injectable or oral corticosteroids suddenly.

- *The Areas Affected with RA will Show Symptoms in the following Parts of the Body. these are-*

- *Fingers.*
- *Hands.*
- *Wrists*
- *Knees*
- *Ankles.*
- *Feet.*
- *Toes.*

II. MATERIAL AND METHODS

In this chapter, we will use few methods to determine the severity and causativity of the Rheumatoid Arthritis. Few of the test like Calcium and RA factor are the test will give us the results regarding rheumatoid arthritis

➢ *Ra Factor*

Human IgG-coated latex particles agglutinate with rheumatoid factor in samples, forming insoluble antigen antibody complexes. These insoluble compounds become more turbid when observed at a wavelength of 600(570-630) nm. Increases in turbidity are directly proportional to the amount of radiofrequency (RF) in the sample, which may be measured by comparing it to a calibrator with a known amount of RF.(Chaudhari K, Rizvi S, Syed BA. Rheumatoid arthritis: current and future trends. Nat Rev Drug Discov. 2016 May;15(5):305–6.). Use of fresh serum sample is recommended. Sample should be free from hemolysis and contaminants. Normal range upto 20IU/ml.

A blood test called RF is carried out on those who may have rheumatoid arthritis (RA). It is an autoantibody that reacts with other IgG antibodies to produce immunological complexes that might trigger different inflammatory processes in the body. RF testing are positive in about 80% of RA patients. Numerous autoimmune conditions and several serious infections can result in high levels of RF. On sometimes, healthy individuals have increased RF levels.

➢ *Calcium*

O-cresophthaline complexone and calcium mix to generate a purple complex in an alkaline media. The amount of calcium contained in the sample directly correlates to how intense the colour is. Use of fresh serum sample is recommended. Sample should be free from haemolysis and contaminants. Normal range can be in between 9.0-10.6 mg/dl.

The majority of calcium is contained in the bones. 99% of serum calcium is present in both its bound and free ionised forms (with albumin). Therefore, a drop in albumin results in a drop in calcium levels, and vice versa. The parathyroid hormones have an impact on the amounts of calcium in the serum. In hyperthyroidism associated with bone tumours, levels are higher. (9500 Euclid Avenue, Cleveland, Ohio 44195 | 800.223.2273 | All Rights Reserved. 2022 Cleveland Clinic). In hypothyroidism, renal failure, rickets, and vitamin D insufficiency, levels are decreased.

➢ *Precautions:*

- *In vitro diagnostic reagent intended solely for professional and laboratory use; not for use in treating patients.*
- *Steer clear of skin and mucosal contact.*
- *When flushing the disposal, use a lot of water.*
- *Only dry, clean glasses may be used.*
- *Samples with high activity exhibit extremely high initial absorbance because most of the NADP is transformed before testing begins. If this is thought to be the case, diluted the sample and ran the assay again.*

III. OBSERVATION AND RESULTS

For the clinical research studies, I have taken 50 patients undergoing different symptoms of pain, infection and negative effects on the body. After collecting their daily routine, habits, and medical history data, following tests are performed on their blood sample. After performing these tests, results are obtained and their statistical analysis is done on the basis of results obtained.

To calculate mean of the data-

$$m = \frac{\text{sum of the terms}}{\text{number of terms}}$$

To calculate the standard deviation of give data-

$$\text{SD} = \sqrt{\frac{\sum |x - \bar{x}|^2}{n}}$$

There are many other parameters in the statistics like median, mode, variance, errors and many more, but here only mean and standard deviation of data is required.

By putting the values in the above formula, will verify our data that is it is correct or not. This will help us to know the exact condition of the patient.

A. Ra Factor

This test mainly determines the severity of the rheumatoid arthritis problem in patient. The test is done by qualitative as well as quantitative methods. But here I have only considered the quantitative results to avoid false positives errors.

➢ *Results as per Age*

- *Age Group – I (5-20 Yrs)*

Table 1 Age Group – I (5-20 Yrs)

S.NO	NAME	GENDER	AGE	RA FACTOR (<14)	CATEGORY
1	MS. HIMANI	FEMALE	20	**29.5**	**ABNORMAL**
2	MS. DRISHTI	FEMALE	19	**27.3**	**ABNORMAL**
3	MR. RAHUL	MALE	14	10	NORMAL

✓ Mean = 22.26
✓ Standard deviation = 10.68

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Patients under this age group is at great risk to have this problem due to lack of nutrition in their diet and unhealthy dietary products.

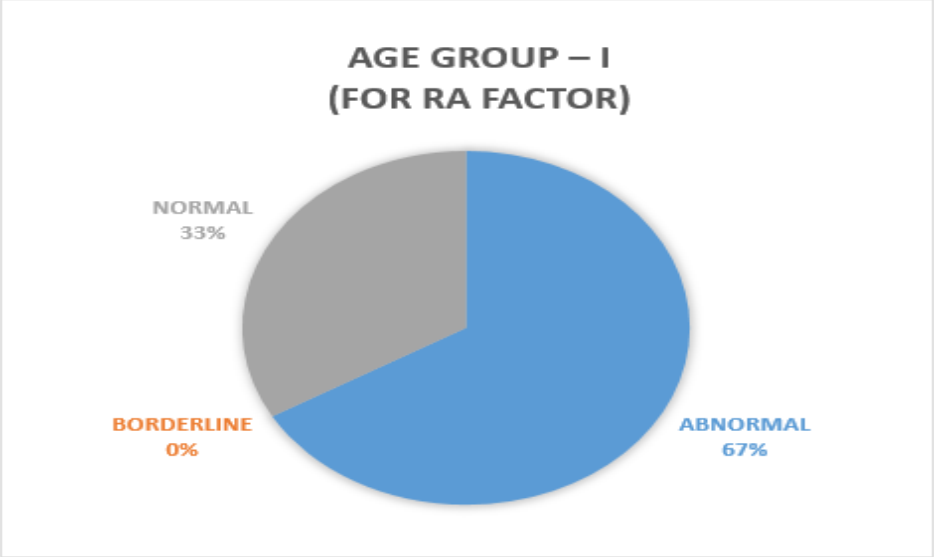

Fig 1 Age Group – I (5-20 Yrs)

- *Age Group- II (21-45 Yrs)*

Table 2 Age Group- II (21-45 Yrs)

S.NO	NAME	GENDER	AGE	RA FACTOR (<14)	CATEGORY
1.	MRS. DINESH BALA	FEMALE	45	6.5	NORMAL
2.	MS. SUNITA KUMARI	FEMALE	45	12.3	BORDERLINE
3.	MR. GAURAV PURI	MALE	45	15.1	ABNORMAL
4.	MRS. VARINDER KAUR	FEMALE	42	9.2	NORMAL
5.	MR. HARCHAND	MALE	42	3.6	NORMAL
6.	SUNIL JAIN	MALE	40	4.6	NORMAL
7.	MR. DINESH KUMAR	MALE	40	9.4	NORMAL
8.	MRS. JYOTI PURI	FEMALE	40	11.5	NORMAL
9.	MR. RAVINDER CHOPRA	MALE	38	21.6	ABNORMAL
10.	MRS. RENU BALA	FEMALE	37	6.4	NORMAL
11.	MR. PANKAJ SHARMA	MALE	35	13.1	BORDERLINE
12.	DR. GAURAV	MALE	33	14.9	BORDERLINE
13.	MR. BALJIT KUMAR	MALE	33	15.2	ABNORMAL
14.	MRS. PUSHPA DEVI	FEMALE	32	45.1	ABNORMAL
15.	MR. SUNIL KUMAR	MALE	32	58.6	ABNORMAL
16.	MRS. DOLLY SHARMA	FEMALE	31	19.4	ABNORMAL
17.	MRS. KAMAL ATTAR	FEMALE	30	5.5	NORMAL
18.	MR. AKASH	MALE	27	4.5	NORMAL
19.	MS. ANVI CHOPRA	FEMALE	27	10.9	NORMAL
20.	MR. VARUN MAHAJAN	MALE	26	12.3	BORDERLINE
21.	SANDEEP GUPTA	MALE	26	14.9	BORDERLINE
22.	MRS. TRISHLA	FEMALE	26	3.2	NORMAL
23.	MS. VAANI SHARMA	FEMALE	25	22	ABNORMAL
24.	MS. BHAWNA	FEMALE	24	14	BORDERLINE
25.	MS. SONIA	FEMALE	23	23.2	ABNORMAL

✓ Mean = 15.08
✓ Standard deviation = 12.62

In this age group, due to high stress level (office work, studies, families) and skipping of meals as well as extra work done by body, leads to low bone density and accumulation of few uric acid and calcium oxalate crystals in their bones and joints results in the bone problems.

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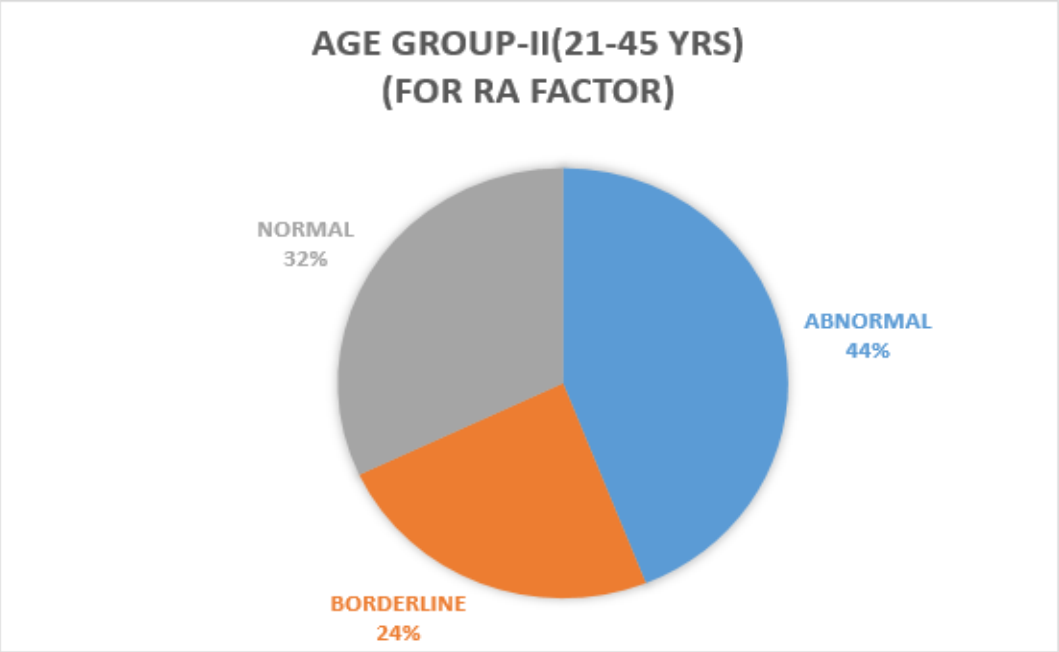

Fig 2 Age Group- II (21-45 Yrs)

- *Age Group-III (45 Above)*

Table 3 Age Group-III (45 Above)

S.NO	NAME	GENDER	AGE	RA FACTOR (<14)	CATEGORY
1.	MR. SITAL SINGH	MALE	69	**15.5**	**BORDERLINE**
2.	MRS. KALPANA	FEMALE	67	7.6	NORMAL
3.	MR. VED PRAKASH	MALE	65	**12.1**	**BORDERLINE**
4.	MRS. MOHINDER KAUR	FEMALE	65	6.9	NORMAL
5.	MR. VIJAY KUMAR	MALE	65	**23.1**	**ABNORMAL**
6.	MRS. DEEPIKA	FEMALE	63	**25.9**	**ABNORMAL**
7.	MR. NIRMAL SINGH	MALE	60	11	NORMAL
8.	SMT. ARUNA DEVI	FEMALE	59	**49.2**	**ABNORMAL**
9.	MR. ARUN MAHAJAN	MALE	59	**26.3**	**ABNORMAL**
10.	MR. SANJAY KUMAR	MALE	59	13.3	NORMAL
11.	MS. AMISHA	FEMALE	58	**31.4**	**ABNORMAL**
12.	MR. BALWINDER SINGH	MALE	58	10.6	NORMAL
13.	MRS. PARKASH DEVI	FEMALE	56	**46**	**ABNORMAL**
14.	KAVYA ARORA	FEMALE	56	**13.9**	**BORDERLINE**
15.	SMT. KASHMIR KAUR	FEMALE	56	**21.3**	**ABNORMAL**
16.	MR. ARUN KOHLI	MALE	54	**20**	**ABNORMAL**
17.	MRS. ANJANA	FEMALE	52	11.2	NORMAL
18.	MRS. BINNI	FEMALE	52	**17.8**	**ABNORMAL**
19.	MRS. SURJIR KAUR	FEMALE	51	**14.8**	**BORDERLINE**
20.	MR. DAVINDER	MALE	51	12	NORMAL
21.	MRS. RAJ RANI	FEMALE	48	**54.3**	**ABNORMAL**
22.	MR. BHARAT VERMA	MALE	47	**26.2**	**ABNORMAL**

✓ Mean = 21.38
✓ Standard deviation = 13.36

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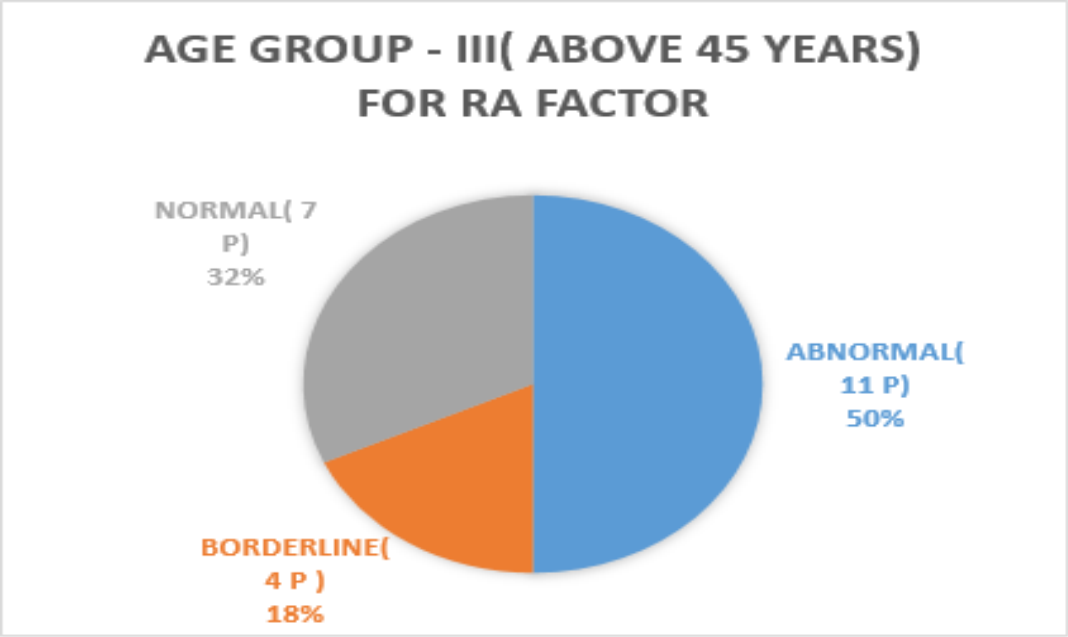

Fig 3 Age Group-III (45 Above)

➢ *Results as per Gender*

- *Female*

Table 4 Female

S.NO	NAME	GENDER	AGE	RA FACTOR (<14)	CATEGORY
1.	MRS. KALPANA	FEMALE	67	7.6	NORMAL
2.	MRS. MOHINDER KAUR	FEMALE	65	6.9	NORMAL
3.	MRS. DEEPIKA	FEMALE	63	**25.9**	**ABNORMAL**
4.	SMT. ARUNA DEVI	FEMALE	59	**49.2**	**ABNORMAL**
5.	MS. AMISHA	FEMALE	58	**31.4**	**ABNORMAL**
6.	MRS. PARKASH DEVI	FEMALE	56	**46**	**ABNORMAL**
7.	KAVYA ARORA	FEMALE	56	**13.9**	**BORDERLINE**
8.	SMT. KASHMIR KAUR	FEMALE	56	**21.3**	**ABNORMAL**
9.	MRS. ANJANA	FEMALE	52	11.2	NORMAL
10.	MRS. BINNI	FEMALE	52	**17.8**	**ABNORMAL**
11.	MRS. SURJIR KAUR	FEMALE	51	**14.8**	**BORDERLINE**
12.	MRS. RAJ RANI	FEMALE	48	**54.3**	**ABNORMAL**
13.	MRS. DINESH BALA	FEMALE	45	6.5	NORMAL
14.	MS. SUNITA KUMARI	FEMALE	45	**12.3**	**NORMAL**
15.	MRS. VARINDER KAUR	FEMALE	42	9.2	NORMAL
16.	MRS. JYOTI PURI	FEMALE	40	11.5	NORMAL
17.	MRS. RENU BALA	FEMALE	37	6.4	NORMAL
18.	MRS. PUSHPA DEVI	FEMALE	32	**45.1**	**ABNORMAL**
19.	MRS. DOLLY SHARMA	FEMALE	31	**19.4**	**ABNORMAL**
20.	MRS. KAMAL ATTAR	FEMALE	30	5.5	NORMAL
21.	MS. ANVI CHOPRA	FEMALE	27	10.9	NORMAL
22.	MRS. TRISHLA	FEMALE	26	3.2	NORMAL
23.	MS. VAANI SHARMA	FEMALE	25	**22**	**ABNORMAL**
24.	MS. BHAWNA	FEMALE	24	**14**	**BORDERLINE**
25.	MS. SONIA	FEMALE	23	**23.2**	**ABNORMAL**
26.	MS. HIMANI	FEMALE	20	**29.5**	**ABNORMAL**
28.	MS. DRISHTI	FEMALE	19	**27.3**	**ABNORMAL**

✓ Mean = 20.23
✓ Standard deviation = 14.35

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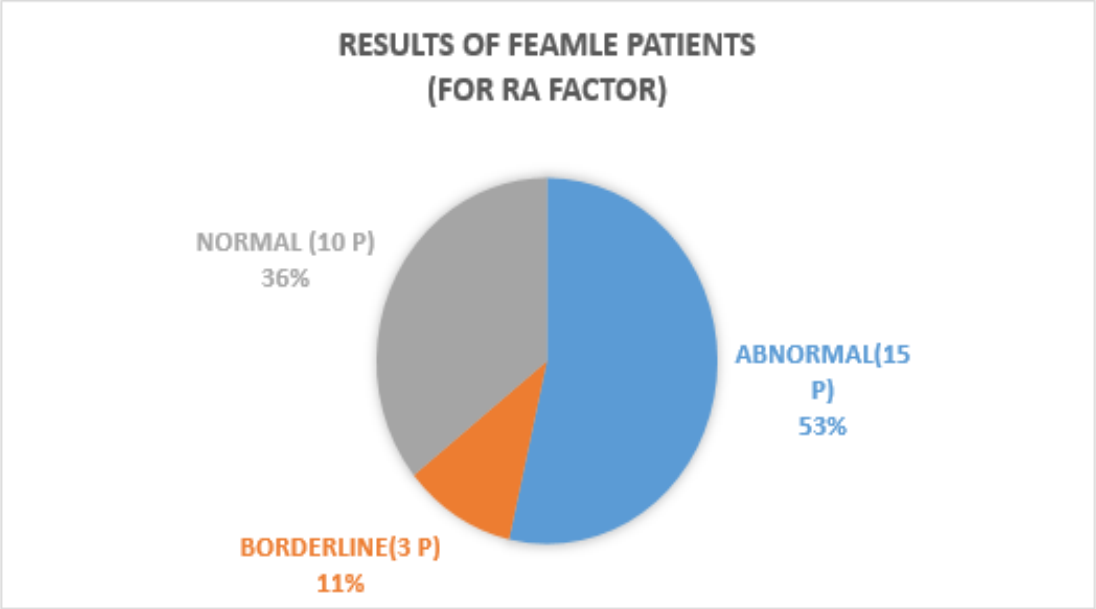

Fig 4 Results of Female Patients

- *Male*

Table 5 Male

S.NO	NAME	GENDER	AGE	RA FACTOR (<14)	CATEGORY
1.	MR. SITAL SINGH	MALE	69	**15.5**	**ABNORMAL**
2.	MR. VED PRAKASH	MALE	65	**12.1**	**BORDERLINE**
3.	MR. VIJAY KUMAR	MALE	65	**23.1**	**ABNORMAL**
4.	MR. NIRMAL SINGH	MALE	60	11	NORMAL
5.	MR. ARUN MAHAJAN	MALE	59	**26.3**	**ABNORMAL**
6.	MR. SANJAY KUMAR	MALE	59	13.3	BORDERLINE
7.	MR. BALWINDER SINGH	MALE	58	10.6	NORMAL
8.	MR. ARUN KOHLI	MALE	54	**20**	**ABNORMAL**
9.	MR. DAVINDER	MALE	51	12	NORMAL
10.	MR. BHARAT VERMA	MALE	47	**26.2**	**ABNORMAL**
11.	MR. GAURAV PURI	MALE	45	**15.1**	**ABNORMAL**
12.	MR. HARCHAND	MALE	42	3.6	NORMAL
13.	SUNIL JAIN	MALE	40	4.6	NORMAL
14.	MR. DINESH KUMAR	MALE	40	9.4	NORMAL
15.	MR. RAVINDER CHOPRA	MALE	38	**21.6**	**ABNORMAL**
16.	MR. PANKAJ SHARMA	MALE	35	13.1	BORDERLINE
17.	DR. GAURAV	MALE	33	**14.9**	**ABNORMAL**
18.	MR. BALJIT KUMAR	MALE	33	**15.2**	**ABNORMAL**
19.	MR. SUNIL KUMAR	MALE	32	**58.6**	**ABNORMAL**
20.	MR. AKASH	MALE	27	4.5	NORMAL
21.	MR. VARUN MAHAJAN	MALE	26	**12.3**	**BORDERLINE**
22.	SANDEEP GUPTA	MALE	26	**14.9**	**ABNORMAL**
23.	MR. RAHUL	MALE	14	10	NORMAL

✓ Mean = 15.99
✓ Standard deviation = 11.15

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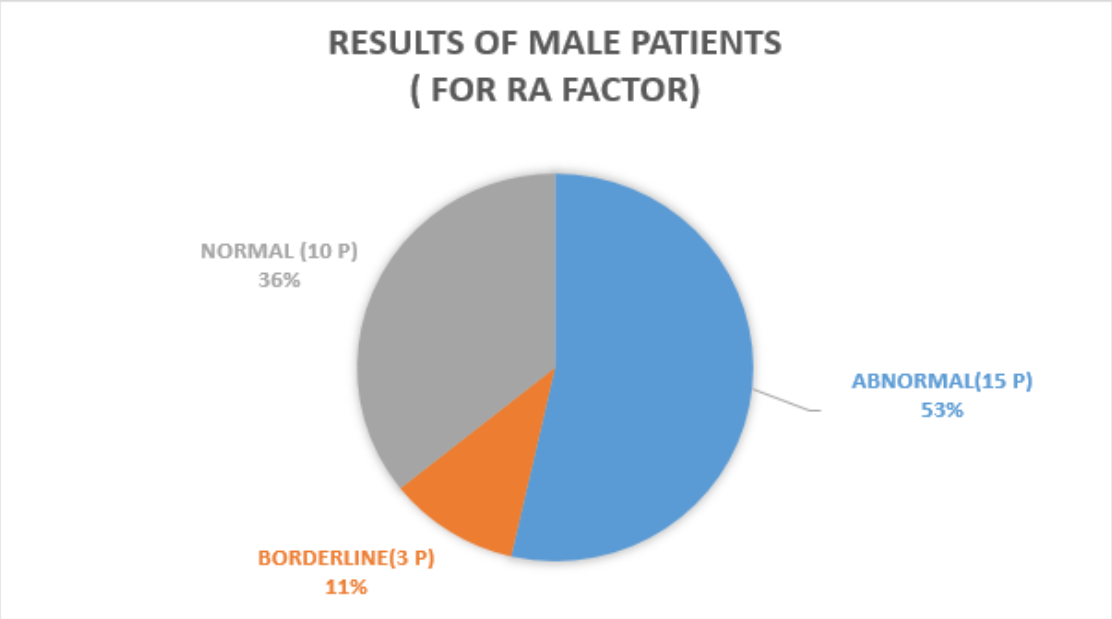

Fig 5 Results of Male Patients

B. Calcium

➢ *Results as per Age*

- Age Group – I

Table 6 Age Group – I

S.NO	NAME	GENDER	AGE	CALCIUM 9.0-10.6 mg/dl	CATEGORY
1	MS. HIMANI	FEMALE	20	6.1	**ABNORMAL**
2	MS. DRISHTI	FEMALE	19	6	**ABNORMAL**
3	MR. RAHUL	MALE	14	8.5	BORDERLINE

✓ Mean = 6.86
✓ Standard deviation = 1.41

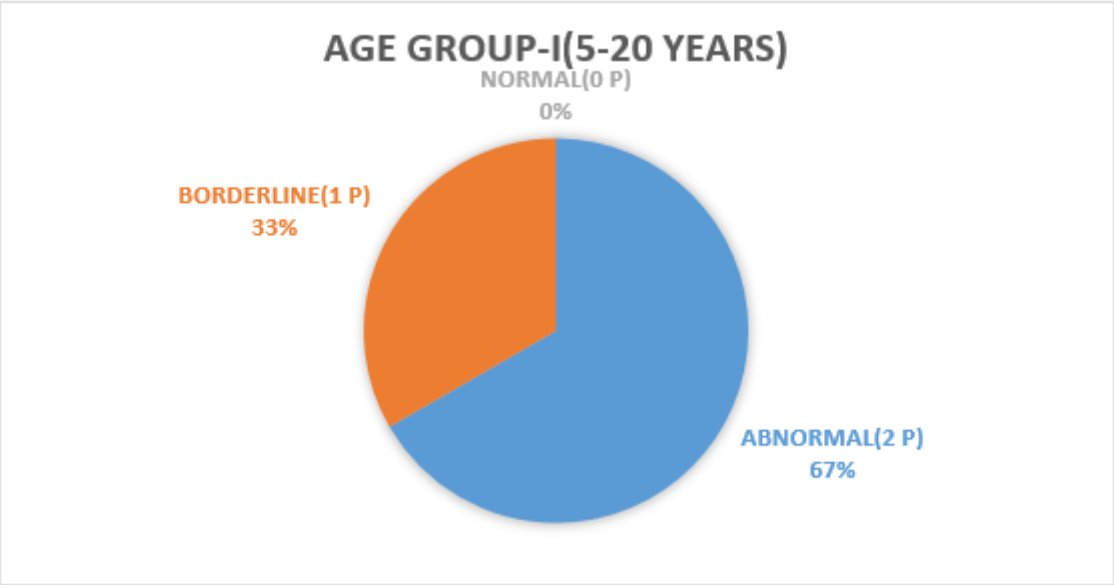

Fig 6 Age Group – I

This age group mostly have calcium deficiency. Because the people of this age group don't like to drink or have dairy products and they also skip their meals in this age group.

- *Age Group- II*

Table 7 Age Group- II

S.NO	NAME	GENDER	AGE	CALCIUM 9.0-10.6 mg/dl	CATEGORY
1	MR. GAURAV PURI	MALE	45	**8.1**	**ABNORMAL**
2	MS. SUNITA KUMARI	FEMALE	45	**6.5**	**ABNORMAL**
3	MRS. DINESH BALA	FEMALE	45	8.4	BORDERLINE
4	MR. HARCHAND	MALE	42	9.6	NORMAL
5	MRS. VARINDER KAUR	FEMALE	42	8.6	BORDERLINE
6	MRS. JYOTI PURI	FEMALE	40	8.8	BORDERLINE
7	MR. DINESH KUMAR	MALE	40	9.2	NORMAL
8	SUNIL JAIN	MALE	40	10.4	NORMAL
9	MR. RAVINDER CHOPRA	MALE	38	9.8	NORMAL
10	MRS. RENU BALA	FEMALE	37	9	NORMAL
11	MR. PANKAJ SHARMA	MALE	35	**7**	**ABNORMAL**
12	MR. BALJIT KUMAR	MALE	33	**6.5**	**ABNORMAL**
13	DR. GAURAV	MALE	33	**7.5**	**ABNORMAL**
14	MR. SUNIL KUMAR	MALE	32	**5.5**	**ABNORMAL**
15	MRS. PUSHPA DEVI	FEMALE	32	**5**	**ABNORMAL**
16	MRS. DOLLY SHARMA	FEMALE	31	**6.5**	**ABNORMAL**
17	MRS. KAMAL ATTAR	FEMALE	30	9	NORMAL
18	MS. ANVI CHOPRA	FEMALE	27	9.4	NORMAL
19	MR. AKASH	MALE	27	9.5	NORMAL
20	MRS. TRISHLA	FEMALE	26	10.5	NORMAL
21	SANDEEP GUPTA	MALE	26	**7.5**	**ABNORMAL**
22	MR. VARUN MAHAJAN	MALE	26	**9.3**	**NORMAL**
23	MS. VAANI SHARMA	FEMALE	25	**6.5**	**ABNORMAL**
24	MS. BHAWNA	FEMALE	24	**7.5**	**ABNORMAL**
25	MS. SONIA	FEMALE	23	**6.3**	**ABNORMAL**

✓ Mean = 8.07
✓ Standard deviation = 1.54

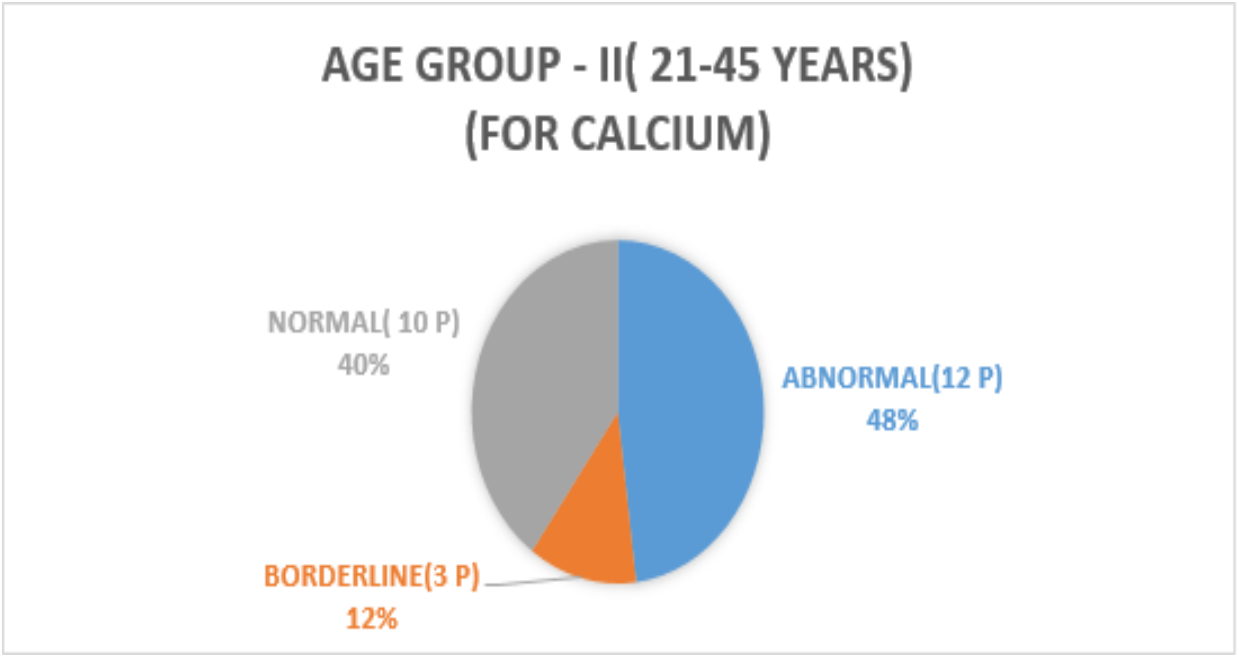

Fig 7 Age Group- II

ISSN No:-2456-2165

- *Age Group-III*

Table 8 Age Group –III

S.NO	NAME	GENDER	AGE	CALCIUM 9.0-10.6 mg/dl	CATEGORY
1	MR. SITAL SINGH	MALE	69	**6.8**	**ABNORMAL**
2	MRS. KALPANA	FEMALE	67	**7.2**	**ABNORMAL**
3	MR. VIJAY KUMAR	MALE	65	**9**	**BORDERLINE**
4	MRS. MOHINDER KAUR	FEMALE	65	9	BORDERLINE
5	MR. VED PRAKASH	MALE	65	**8.9**	**BORDERLINE**
6	MRS. DEEPIKA	FEMALE	63	9.43	NORMAL
7	MR. NIRMAL SINGH	MALE	60	**6.3**	**ABNORMAL**
8	MR. SANJAY KUMAR	MALE	59	9.1	NORMAL
9	MR. ARUN MAHAJAN	MALE	59	**6.5**	**ABNORMAL**
10	SMT. ARUNA DEVI	FEMALE	59	**6.5**	**ABNORMAL**
11	MR. BALWINDER SINGH	MALE	58	9	NORMAL
12	MS. AMISHA	FEMALE	58	**5.4**	**ABNORMAL**
13	SMT. KASHMIR KAUR	FEMALE	56	10.3	NORMAL
14	KAVYA ARORA	FEMALE	56	9	NORMAL
15	MRS. PARKASH DEVI	FEMALE	56	**6**	**ABNORMAL**
16	MR. ARUN KOHLI	MALE	54	**7**	**ABNORMAL**
17	MRS. BINNI	FEMALE	52	**6.5**	**ABNORMAL**
18	MRS. ANJANA	FEMALE	52	9.3	NORMAL
19	MR. DAVINDER	MALE	51	**8.2**	**ABNORMAL**
20	MRS. SURJIR KAUR	FEMALE	51	**7.9**	**ABNORMAL**
21	MRS. RAJ RANI	FEMALE	48	**5.3**	**ABNORMAL**
22	MR. BHARAT VERMA	MALE	47	**7**	**ABNORMAL**

✓ Mean = 7.71
✓ Standard deviation = 1.46

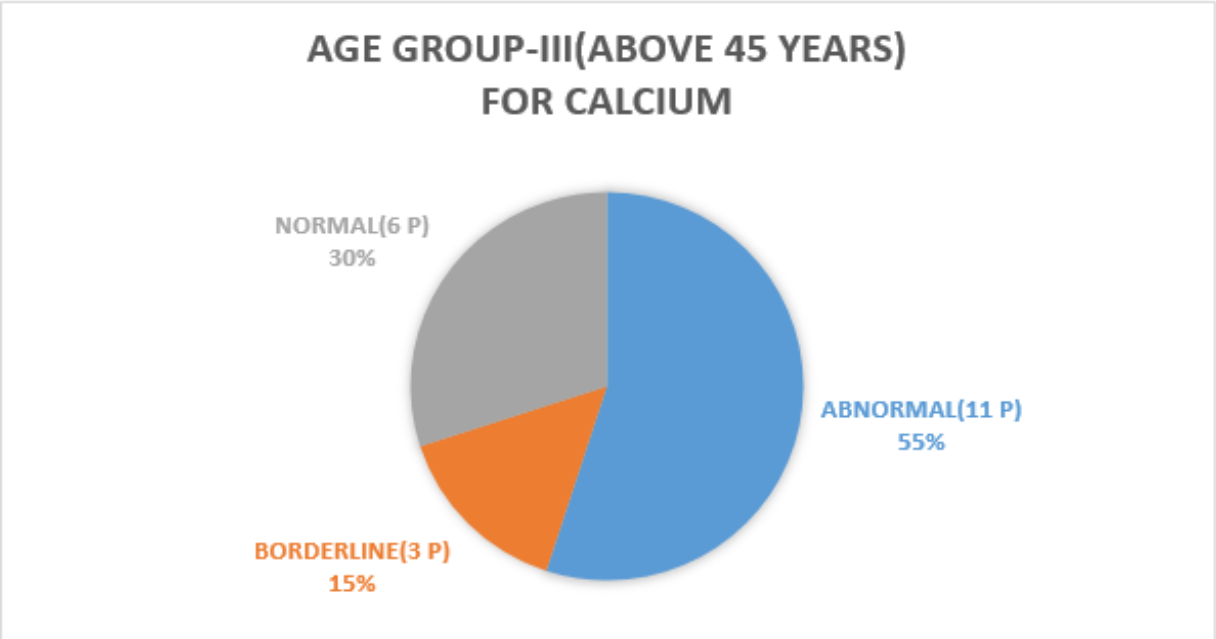

Fig 8 Age Group –III

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➢ *Results as per Gender*

- *Female*

Table 9 Female

S.NO	NAME	GENDER	AGE	CALCIUM 9.0-10.6 mg/dl	CATEGORY
1	MRS. KALPANA	FEMALE	67	**7.2**	**ABNORMAL**
2	MRS. MOHINDER KAUR	FEMALE	65	9	BORDERLINE
3	MRS. DEEPIKA	FEMALE	63	9.43	NORMAL
4	SMT. ARUNA DEVI	FEMALE	59	**6.5**	**ABNORMAL**
5	MS. AMISHA	FEMALE	58	**5.4**	**ABNORMAL**
6	SMT. KASHMIR KAUR	FEMALE	56	10.3	NORMAL
7	KAVYA ARORA	FEMALE	56	9	NORMAL
8	MRS. PARKASH DEVI	FEMALE	56	**6**	**ABNORMAL**
9	MRS. BINNI	FEMALE	52	**6.5**	**ABNORMAL**
10	MRS. ANJANA	FEMALE	52	9.3	NORMAL
11	MRS. SURJIR KAUR	FEMALE	51	**7.9**	**ABNORMAL**
12	MRS. RAJ RANI	FEMALE	48	**5.3**	**ABNORMAL**
13	MS. SUNITA KUMARI	FEMALE	45	**6.5**	**ABNORMAL**
14	MRS. DINESH BALA	FEMALE	45	**8.4**	**ABNORMAL**
15	MRS. VARINDER KAUR	FEMALE	42	8.6	BORDERLINE
16	MRS. JYOTI PURI	FEMALE	40	8.8	BORDERLINE
17	MRS. RENU BALA	FEMALE	37	9	NORMAL
18	MRS. PUSHPA DEVI	FEMALE	32	**5**	**ABNORMAL**
19	MRS. DOLLY SHARMA	FEMALE	31	**6.5**	**ABNORMAL**
20	MRS. KAMAL ATTAR	FEMALE	30	9	NORMAL
21	MS. ANVI CHOPRA	FEMALE	27	9.4	NORMAL
22	MRS. TRISHLA	FEMALE	26	10.5	NORMAL
23	MS. VAANI SHARMA	FEMALE	25	**6.5**	**ABNORMAL**
24	MS. BHAWNA	FEMALE	24	**7.5**	**ABNORMAL**
25	MS. SONIA	FEMALE	23	**6.3**	**ABNORMAL**
26	MS. HIMANI	FEMALE	20	**6.1**	**ABNORMAL**
27	MS. DRISHTI	FEMALE	19	**6**	**ABNORMAL**

✓ Mean = 7.62
✓ Standard deviation = 1.62

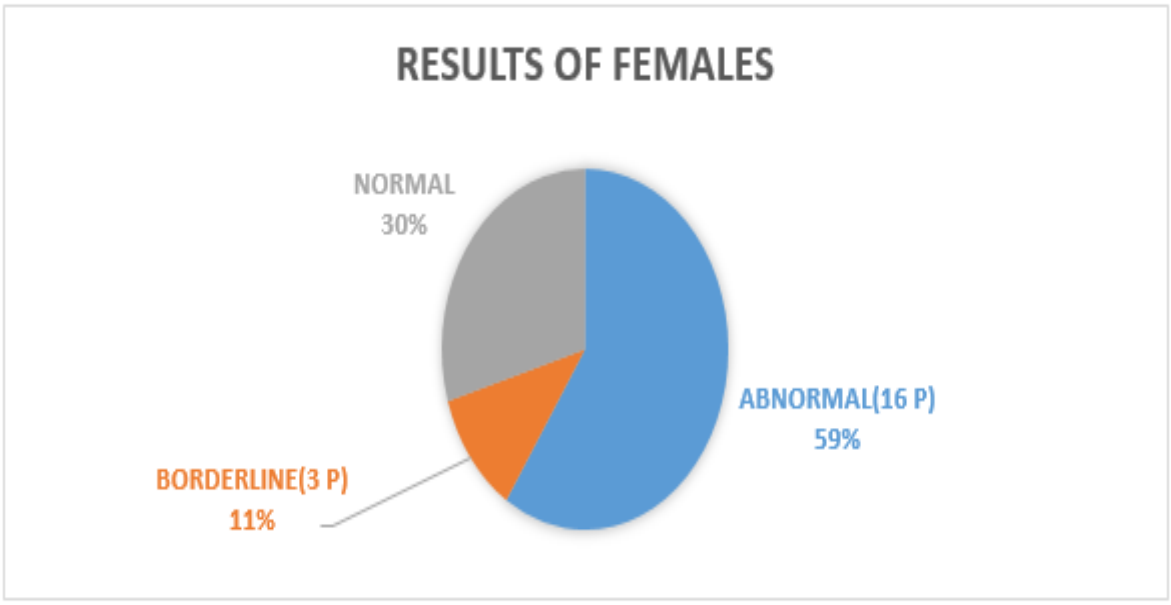

Fig 9 Result of Female

- *Male*

Table 10 Male

S.NO	NAME	GENDER	AGE	CALCIUM 9.0-10.6 mg/dl	CATEGORY
1	MR. SITAL SINGH	MALE	69	**6.8**	**ABNORMAL**
2	MR. VIJAY KUMAR	MALE	65	**9**	**BORDERLINE**
3	MR. VED PRAKASH	MALE	65	**8.9**	**BORDERLINE**
4	MR. NIRMAL SINGH	MALE	60	**6.3**	**ABNORMAL**
5	MR. SANJAY KUMAR	MALE	59	9.1	NORMAL
6	MR. ARUN MAHAJAN	MALE	59	**6.5**	**ABNORMAL**
7	MR. BALWINDER SINGH	MALE	58	9	NORMAL
8	MR. ARUN KOHLI	MALE	54	**7**	**ABNORMAL**
9	MR. DAVINDER	MALE	51	**8.2**	**ABNORMAL**
10	MR. BHARAT VERMA	MALE	47	**7**	**ABNORMAL**
11	MR. GAURAV PURI	MALE	45	**8.1**	**ABNORMAL**
12	MR. HARCHAND	MALE	42	9.6	NORMAL
13	MR. DINESH KUMAR	MALE	40	9.2	NORMAL
14	SUNIL JAIN	MALE	40	10.4	NORMAL
15	MR. RAVINDER CHOPRA	MALE	38	**9.8**	**NORMAL**
16	MR. PANKAJ SHARMA	MALE	35	**7**	**ABNORMAL**
17	MR. BALJIT KUMAR	MALE	33	**6.5**	**ABNORMAL**
18	DR. GAURAV	MALE	33	**7.5**	**ABNORMAL**
19	MR. SUNIL KUMAR	MALE	32	**5.5**	**ABNORMAL**
20	MR. AKASH	MALE	27	9.5	NORMAL
21	SANDEEP GUPTA	MALE	26	**7.5**	**ABNORMAL**
22	MR. VARUN MAHAJAN	MALE	26	9.3	NORMAL
23	MR. RAHUL	MALE	14	**8.5**	**ABNORMAL**

✓ Mean = 8.09
✓ Standard deviation = 1.34

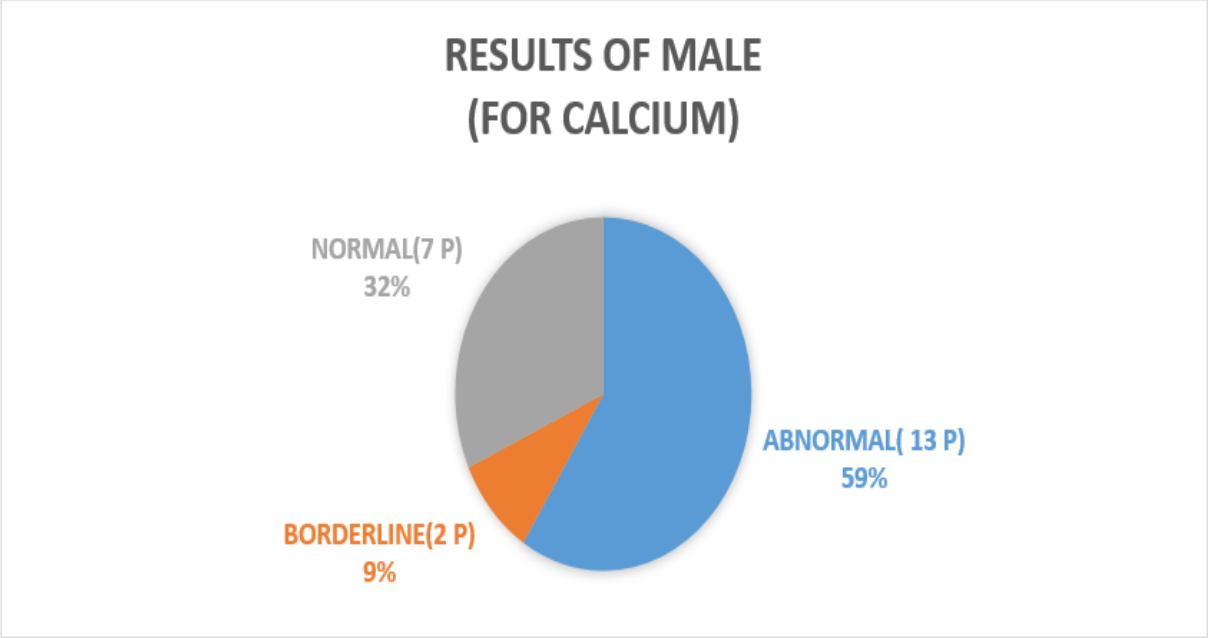

Fig 10 Result of Male

IV. DISCUSSION AND CONCLUSION

➢ *Discussion*

In our research work, we came to know that what can be the possible causes of Rheumatoid arthritis. According to symptoms that patient was having, I performed few tests on the blood sample of patients of different age groups and different gender. Most of the test like RA factor, CRP, Uric Acid and calcium were performed on serum sample except ESR which was performed on plasma. After putting the values of obtained results in our statistical analysis, we found that different age groups shown the different results. Same is case of gender differentiation, different results are found.

As per the findings of Dr. Syed A.A. Rizvi, I also found that rheumatoid arthritis affects our small and large joints as well as its severity may also affects other parts of body like eyes, skin (redness and itching). Due to lack of nutrition in their diet and high stress level results in improper intake of proper diet resulting nutrition deficiency like calcium, vitamin D3.

In RA factor testing of blood samples of different age groups like- are found.

		mean ± SD
Age group – I (5-20 years)	=	(22.26 ± 10.68)
Age group – II(21-45 years)	=	(15.08 ± 12.62)
Age group – III (above 45 years)	=	(21.38 ± 13.36)

Similarly, in case of CRP, Calcium, Uric Acid and ESR these mean and standard deviation values are calculated. The purpose of these statistical analysis to simplify the data into simple form so that the result can be concluded easily and accurately.

➢ *Prominancy*

If we talk about which age group is more prominent to this condition, then all the three age groups are at higher risk to adopt this problem. Because in every age group, there is certain abnormal diet pattern, work load and many other factors have seen.

➢ *Age Group – I (5-20 Years)*

This is the age of growth of body. in this age near about 20% of people are at risk to have this problem. The reason behind improper uptake of nutrition, more consumption of fast food, low fruits and vegetable uptake. Which results in deficiency of fiber and few minerals in the body which will result in the Rheumatoid arthritis.

➢ *Age Group – II (21-45 Years)*

Most of the patients are seen from this age group now days. About 60-65% patients from this group suffering from chronic joint pain Because after 30, bone density got lowered. Females are more prone to this problem as compared to males.

➢ *Age Group – III (Above 45 YEAR)*

About 20- 30 % patients are from this age group. With the passage of age, the body starts functioning on slower rate as compared to previous one. In female, due to menopause cycle, there is loss of blood which includes loss of Iron and calcium, resulting low fiber content and low calcium levels. Uric acid crystals start accumulating over bones due to improper excretion of uric acid

➢ *Gender*

Females are prominent to this problem as compared to male. Reason behind high stress level, menopause, low bone density after 30. In males, tis condition is mainly seen in that people who are suffering from any chronic disease.

V. CONCLUSION

RA is a chronic, crippling inflammatory condition that can destroy joints and result in long-term disability. To avoid catastrophic harm and the loss of vital biological functions, early diagnosis and intervention are crucial. The treating physician should think about following the guidelines for treat-to-target (T2T), which suggest first setting the goals and then putting the protocols in place to attain and evaluate them.

A specialist recommendation made early on can also contribute to better treatment outcomes. We now have a better understanding of the illness mechanisms thanks to developments in the field of molecular medicine, which can help in the development of more efficient treatments. Both new and improved treatment modalities have been developed. Using gene array analysis, it is possible to identify which patients will respond better to particular treatments. By personalising care, it will be possible to treat patients more quickly and reduce the risk of disease progression while searching for the best possible treatment for a given patient. It is also possible to identify which patients are more likely to develop more severe forms of RA by using gene array analysis. It is anticipated that the management of RA will witness significant advancements in treatment modalities.

So continue consuming foods high in fibre and calcium to maintain the health of your bones. Therefore, you must consume these nutrients on a daily basis to maintain the health of your bones. Bone health is the basic thing to maintain your overall health.

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APPENDIX

Myself Ms. Sunaina. I am doing my dissertation work on rheumatoid arthritis. Here are few questions regarding your health. Kindly answer them correctly for the correct analysis of your results. This questioner is only for the research purpose not for anything else.

NAME: _____AGE/SEX: _____DOB: _____

CONTACT NO.: _____AREA OF RESIDENCE: _

_____

S.NO	QUESTION	YES	NO	NOT SURE
1.	Do you have any pain in your any joint?			
2.	Do your any family member is having joint problem?			
3.	Do you smoke?(if yes, then mention no. of cigarette)			
4.	Are you alcoholic?			
5.	Do you take any calcium or vitamin supplements?			
6.	Is you take fiber rich diet daily?			
7.	Do you take dairy product (milk/cheese/curd etc.) daily?			
8.	Is your periods are regular (for female)?			
9.	Do you feel pain during movement of your joints?			
10.	Do you have morning stiffness in your joints?			
11.	Did you go through your health checkup regularly?			
12.	Did you have any surgery if yes then mention.			
13.	Are you a student or a employee?			
14.	Do you drink sufficient amount of water?			
15.	Are you taking any medicine regarding any problem?			

Signature: **SUNAINA**