

# Outcome of Calcium & Vit D Level in Premenopausal Female Visiting Teaching Hospital

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## Abstract:-

**BACKGROUND:** IDA is a common disorder with multiple underlying causes that may be influenced by a person's age, the length of their symptoms, and other biochemical indicators. The most prevalent condition among premenopausal women is premenstrual syndrome (PMS). Women with PMS had lower blood calcium and vitamin D levels than healthy women, and calcium supplements may help symptoms feel less severe. Everywhere in the world, osteoporosis is regarded as a serious public health issue. Preventive measures must therefore be taken throughout the life course.

**METHODOLOGY:** In 161 individuals, our goal was to look into the relationship between IDA and a number of clinical characteristics. To identify possible correlations with IDA, the patients' age, the length of their complaints, their calcium levels, and their vitamin D levels were evaluated. The study assessed vit D and calcium level with IDA in 161 patients enrolled after ethical committee approval. Information and data were collected using a predesign proforma. The study did not include individuals who were unwilling. The Chi-square test was regarded as significant (P value 0.05).

**RESULTS:** According to our findings, the majority (58.4%) of the reported concerns for an average of 58.4 months, and the mean age of the was 38.6 years. Furthermore, authentic cases of IDA were found in 54% of patients. There was no clear relationship between age and the prevalence of IDA when looking at age groups. Patients under 40 years old (56%) and those beyond 40 years old (52.3%) both showed notable IDA incidences. In a similar vein, the length of complaints had little bearing on the chance of IDA development because the percentage of instances remained constant. We looked at calcium and vitamin D levels as two significant biochemical markers in relation to IDA. Notably, IDA was found to have a strong correlation with low vitamin D levels, with low vitamin D levels present in 79.8% of IDA patients. Calcium levels, on the other hand, did not show a strong correlation with IDA.

**CONCLUSION:** Our work shows that IDA and clinical factors interact in a complicated way. Age and the length of the complaint do not appear to be reliable indicators of IDA, however low vitamin D levels seem to be closely related to the condition. Our findings emphasize the significance of taking numerous factors into account when diagnosing and treating iron deficient anemia, with a focus on the potential contribution of vitamin D to its etiology. Additional prospective studies are required to confirm and build upon these findings, possibly directing better diagnostic and therapeutic strategies for IDA patients.

**Keywords:-** Pain, Osteoarthritis, Menopause, Calcium, Vitamin D, Symptoms.

## I. INTRODUCTION

Due to physiological changes and menstruation, iron deficiency is one of the most common health issues in young girls, especially among women<sup>1</sup>. Anemia can be caused by a variety of factors, such as eating disorders, problems with iron absorption, a lack of iron in the diet, monthly bleeding, acute and chronic infections, parasite infections, and genetic diseases<sup>2-3</sup>. Additionally, a key contributor to anemia is iron deficiency<sup>4</sup>. Iron deficiency anemia can cause physical dysfunction, lower their capacity to fight infections, and hinder their ability to learn and perform professionally<sup>5</sup>. According to the World Health Organization, iron deficiency anemia affects over 49% of school-age children and about 42.3% of women aged 15 to 59 in underdeveloped nations<sup>6</sup>. Anemia in adolescent girls remains a global health issue despite efforts to address it through initiatives like nutrition education, the prevention and treatment of parasitic infections, and the provision of weekly iron supplements<sup>7-9</sup>. Inadequate diagnosis and treatment of iron deficiency can have substantial lifelong health repercussions in females, who are especially susceptible to it. Heavy menstrual blood loss is the most often reported cause of anemia in pre-menopausal women. In the pre-menopausal age group, 5%–10% of women who present with iron deficiency anemia (IDA) have a menstrual problem<sup>10</sup>. Ages 35 to 39 mark the start of pre-menopause; at

this time, monthly changes are absent, but decreased fertility and fecundity occur as the first signs of ovarian follicle depletion and malfunction<sup>11</sup>. The maintenance of calcium-phosphate equilibrium depends critically on vitamin D, a fat-soluble vitamin. Its lack causes rickets in children and osteomalacia in adults. The function of vitamin D deficiency as a risk factors for infections such tonsillitis, sepsis, influenza, urinary tract, and vaginal infections have been discussed in numerous papers. Creating chemokine's and controlling the immune system both depend on vitamin D. Vitamin D Receptors (VDRs), which control immunological responses, are present in B & T lymphocytes and dendritic cells. Additionally equipped with VDRs, macrophages are given an oxidative boost by vitamin D<sup>12-17</sup>. Studies have revealed that the body's cathelicidin activity, which has an antibacterial role<sup>18</sup>.

**II. METHODOLOGY**

Between January 2022 and January 2023, this cross-sectional study was carried out at the Mardan Medical Complex Teaching Hospital Medical Outdoor Patient Department (OPD). Prior to beginning the study; the institutional ethical committee gave its clearance. All participants gave their informed consent after being informed

of the study's aims and methods. The use of the participants' data for research and educational purposes was promised to them. Non-probability consecutive sampling was used to register a total of 161 patients in the trial. MMC's medical OPD visitors were invited to take part in the study. A thorough strategy was used to collect the data, which included gathering background information, doing a physical exam, and filling out a pre-made proforma. This proforma was given to enrolled patients in order to gather pertinent data regarding their clinical characteristics and medical history. A questionnaire was given to female participants to collect information on their socioeconomic standing, educational background, use of contraceptives, and history of abortions, marital status, and parity status. Menopausal women were identified and excluded from some analyses based on their menopausal status. The final day of a premenopausal woman's menstrual cycle was noted. The pathology department of the hospital carried out the pathological investigations. The recruited patients' calcium, vitamin D, and iron deficient anemia levels were evaluated. Version 24.0 of the IBM SPSS software suite was used for data analysis. To examine relationships between pre-menopausal symptoms and different characteristics, continuous variables were compiled, frequencies were computed, and the Chi-square test was used. Statistical significance was defined as p 0.05 or lower.

**III. RESULTS**

Total 161 patients enrolled results were analyzed and following result were obtained.

Table 1: Age, Complaint Frequency Mean And Standard Divation

	N	MEAN	ST DIV
AGE	161	38.6	1.1811
DURATION OF COMPLAINT	94	58.4%6.83	4.242
BELOW 40	94	58.4%	
ABOVE 40	67	41.66%	

Table 2: variables with details

		FRQUENCY	PERCENTAGES
IRON DEFICENCY ANEMIA	VALID	87	54%
	NON VALID	74	46%
Calcium level	Decrease	10	6.2%
	Normal	151	9.38%
Vit d level	decrease	89	55.3%
	Normal	72	44.7%

Table 3: Iron Deficiency Anemia

	IRON DEFICIENCY ANEMIA			P-VALUE
	YES	NO	TOTAL	
AGE GROUP	BELOW 40	42(56%)	33(44%)	0.641
	ABOVE 40	45(52.3%)	41(47.7%)	
COMPLAINTS	<05 MONTHS	71(52.6%)	64(47.4%)	0.400
	>05 MONTHS	16(61.5%)	10(38.5%)	

Table 4: variables VERSUS IRON DEFICINECY ANEMIA

Variables		IRON DEFICINECY ANEMIA			P VALUE
		YES	NO	TOTAL	
Calcium level	decrease	7(70%)	3(30%)	10	0.287
	Normal	80(53%)	71(47%)	100%	
Vit D level	decrease	71(79.8%)	18(20.2%)	89	0.00
	normal	16(2.3%)	56(77.8%)	72	

#### IV. DISCUSSION

The 161 patients in our study had an average age of 38.6 1.811 years. The length of a complaint was 6.83 4.24 months on average. The presence of iron deficiency anemia does not appear to be strongly correlated with age groups (below 40 and above 40). In both age categories, the proportions of patients who have iron deficiency anemia are comparatively equal. In comparison, 67 (41%) of the women were over 40 and 94 (58.4%) were under 40 (tables 1, 2, and 3 and 8). 10 (6.2%) individuals had a history of low calcium levels, compared to 151 (93.8%) individuals who did not (Table 5). There doesn't seem to be a direct correlation between the length of the complaint and iron deficiency anemia. For problems lasting longer than five months, the percentage of anemia cases is slightly higher, but the difference is not very noticeable. According to some research, a lack of vitamin D affects how susceptible people are to infections and how well they respond to antibiotic therapy<sup>19-20</sup>. Iron deficiency anemia does not appear to significantly correlate with calcium levels. However, there is a clear association between vitamin D levels. Most people who suffer from iron deficiency anemia have lower vitamin D levels. While 89 (55.3%) of the female patients had lower levels of hormonal vitamin D, 72 (44.7%) of the patients have normal levels (Table 6). pre-menopausal women frequently have vitamin D deficiency, and this is thought to be a major factor in bone health. Lack of vitamin D lowers BMD and increases the risk of osteoporosis<sup>21</sup>. A lack of vitamin D results in increased parathyroid hormone (PTH) release, which raises bone resorption and promotes rapid bone turnover<sup>22</sup>. The age distribution of the research participants was comparable to that of Jackson RT et al.'s study from 2018, which evaluated people with a comparable age distribution to those in the current investigation<sup>23</sup>. It was discovered that among women under the age of forty, 42 (56.0%) had IDA whereas the remaining 33 (44.0%) did not. In individuals older than 40, IDA was present in 45 (52.3%) while it was absent in 41 (47.7%) patients. With a p value of 0.641, this difference was not statistically significant. (See Tables 4 and 7). IDA not present in the remaining 3 (30%), 71 (47.0%), and 7 (70.0%) out of 151 individuals with calcium level against IDA, respectively. This difference was not statistically significant because of the p value of =0.287 (Table 9). 71 (52.6%) of the women with a complaint length of less than 05 months had IDA, compared to 64 (47.4%) of the women with a complaint duration of more than 05 months. 16 (61.5%) of the patients

who had maintained compliance for more than 05 months developed IDA, as opposed to 10 (38.5%) who did not. Due to this discrepancy's low significance (p value of 0.400), table 10 is used. Pre-menopausal women in the research study had a low frequency of severe vitamin D insufficiency<sup>24</sup>.

#### V. CONCLUSION

Our study reveals a complex interplay between IDA and clinical parameters. While age and complaint duration do not seem to be strong predictors of IDA, reduced vitamin D levels appear to be closely associated with the condition. Our findings underscore the importance of considering multiple factors when assessing and managing iron deficiency anemia, emphasizing the potential role of vitamin D in its etiology. Further prospective studies are warranted to validate and expand upon these observations, potentially guiding improved diagnostic and therapeutic approaches for patients affected by IDA. Insufficient vitamin D and calcium may increase the risk of osteoporosis among premenopausal women in the mardan, particularly in those who are 40 and older. To avoid osteoporosis and iron deficiency anemia, serum 25(OH)D levels should be continuously monitored. It is equally necessary to women as iron. A study advises women to take calcium and vitamin D supplements, change their diets, and spend time outside every day.

#### VI. LIMITATION

Limitations of the present study include the small sample size. The second issue is that such a study should be conducted on multiple educational facilities with various clinical characteristics, and the quality of life of those participants would be assessed using a disease-specific questionnaire. The establishment of causal links is constrained by the cross-sectional design of the study. Selection bias could be introduced by convenience sampling. The single-center design of the study can restrict the applicability of the conclusions.

## REFERENCES

- [1]. Pasricha SR, Tye-Din J, Muckenthaler MU, Swinkels DW. Iron deficiency. *The Lancet*. 2021 Jan 16;397(10270):233-48.
- [2]. Ahankari AS, Myles PR, Fogarty AW, Dixit JV, Tata LJ. Prevalence of iron-deficiency anaemia and risk factors in 1010 adolescent girls from rural Maharashtra, India: a cross-sectional survey. *Public Health*. 2017 Jan 1;142:159-66.
- [3]. Singh M, Rajoura OP, Honnakamble RA. Anemia-related knowledge, attitude, and practices in adolescent schoolgirls of Delhi: A cross-sectional study. *International Journal of Health & Allied Sciences*. 2019 Apr 1;8(2):144-8.
- [4]. Keikha F, Ansari H, Khosravi M, Seraji M. The effect of educational intervention on health literacy and nutritional performance of female high school students in Zahedan. *Journal of Health Literacy*. 2021 Jun 1;6(1):41-50.
- [5]. Samadbeik M, Saremi M, Sohrabizadeh M, Birjandi M, Garavand S. Evaluation of E-health literacy in Paramedicine and Health Nutrition students of Lorestan University of Medical Sciences. *Journal of Health Literacy*. 2020 May 21;5(1):12-22.
- [6]. Tezera R, Sahile Z, Yilma D, Misganaw E, Mulu E. Prevalence of anemia among school-age children in Ethiopia: a systematic review and meta-analysis. *Systematic reviews*. 2018 Dec;7:1-7.
- [7]. Akbari M, Moosazadeh M, Tabrizi R, Khatibi SR, Khodadost M, Heydari ST, Tahami AN, Lankarani KB. Estimation of iron deficiency anemia in Iranian children and adolescents: a systematic review and meta-analysis. *Hematology*. 2017 Apr 21;22(4):231-9.
- [8]. Mengistu G, Azage M, Gutema H. Iron deficiency anemia among in-school adolescent girls in rural area of Bahir Dar City Administration, North West Ethiopia. *Anemia*. 2019 Mar 21;2019.
- [9]. Sajna MV, Jacob SA. Adherence to weekly iron and folic acid supplementation among the school students of Thrissur corporation—a cross sectional study. *International Journal Of Community Medicine And Public Health*. 2017 May;4(5):1689-94.
- [10]. Mishra V, Verneker R, Gandhi K, Choudhary S, Lamba S. Iron deficiency anemia with menorrhagia: Ferric carboxymaltose a safer alternative to blood transfusion. *Journal of mid-life health*. 2018 Apr;9(2):92.
- [11]. Ahuja M. Age of menopause and determinants of menopause age: A PAN India survey by IMS. *Journal of mid-life health*. 2016 Jul;7(3):126.
- [12]. Kungurtseva AL. Relationship between vitamin D level and postoperative complications in the practice of a plastic surgeon. *J Complement Med Res* 2021 Mar 18;11(5):159-.
- [13]. Arliny Y, Yunus F, Burhan E, Andarini S, Jusman SW, Yunir E, et al. Diagnostic predictors of active tuberculosis infection in diabetic patients with latent tuberculosis: A review on cathelicidin and 1,25-dihydroxyvitamin D3. *J Nat Sci Biol Med* 2021;12:117-23.
- [14]. Kumar A. Association of vitamin D with vascular inflammation. *J Nat Sci Biol Med* 2019 Jul 1;10(2):103-.
- [15]. Shaheena A, Manjrekar P, D'souza V, Kamath P, Rukmini M, Chandran V, et al. Does serum vitamin D status influence high-sensitivity c-reactive protein and gensini score in established coronary artery disease individuals. *J Nat Sci Biol Med* 2019 Jul 1;10(2):197-201
- [16]. Al-Rawaf SA, Mousa ET, Kamal Abdulhussein F. Correlation between serum vitamin D and calcium levels in missed miscarriage. *Arch Razi Institute* 2022 Aug 1;77(4):1339-43. doi: 10.22092/ari.2022.357400.2037
- [17]. Salman Jasim H, Khalid Shafeeq N, Abass EA. Vitamin D level and its relation with the newly diagnosed diabetic neuropathy in women with hypothyroidism. *Arch Razi Inst* 2022 Jun 1;77(3):1139-45.
- [18]. Hassani MK. Role of vitamin D as protective agent against induced liver damage in male rats. *Arch Razi Inst* 2021 Dec 31;76(6):1815-22
- [19]. Paavonen J, Brunham RC. Bacterial vaginosis and desquamative inflammatory vaginitis. *New England J Med* 2018 Dec 6;379(23):2246-54.
- [20]. Shihab AS, Hamdi MA, Jumaa AM, Marbut MM, Jwad SK. Dyslipidemia and other parameters in women with pregnancy induced hypertension. *J Popul Ther Clin Pharmacol* 2022 Apr 11;29(1):e116-e121
- [21]. Çolak Y, Afzal S, Nordestgaard BG. 25-Hydroxyvitamin D and risk of osteoporotic fractures: Mendelian randomization analysis in 2 large population-based cohorts. *Clin Chem*. 2020;66:676–685
- [22]. Gao C, Qiao J, Li SS, et al. The levels of bone turnover markers 25(OH)D and PTH and their relationship with bone mineral density in postmenopausal women in a suburban district in China. *Osteoporos Int*. 2017;28:211–218
- [23]. Zareef TA, Jackson RT, Alkahtani AA. Vitamin D intake among premenopausal women living in Jeddah: food sources and relationship to demographic factors and bone health *J Nutr Metab*. 2018;2018:13.
- [24]. Kharroubi A, Saba E, Smoom R, Bader K, Darwish H. Serum 25-hydroxyvitamin D and bone turnover markers in Palestinian postmenopausal osteoporosis and normal women. *Arch Osteoporos*. 2017;12:13.