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A Cross Sectional Study On Assessment Of Calcium Deficiency And Problems Associatedwith This In Females Of Mangali Area Of Hisar

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ABSTRACT: Background:Adequate calcium intake is essential from childhood to the end of life span and is critical for formation and retention of healthy skeleton. Calcium if not supplemented through diet leads to resorption of bones thereby causing osteoporosis and increased susceptibility to fractures specially in post menopausal females.
Aim and objectives:1.To study the prevalence of calcium deficiency in females of Mangali area of Hisar.
2.Correlating calcium deficiency with various socio economic factors.
3. To study various problems arising due to calcium deficiency in females.
Method:It is a cross sectional conventional study done at CHC, Mangali village, district Hisar of Haryana.Data was collected from June 2020 to August 2020. 150 females of different age groups who were visiting the CHC were questioned about various aspects of calcium intake.
Result:44% females have not consumed milk since last 5 years or more. 80% of post menopausal females have deficient calcium intake in their diet. Large family size is the major factor leading to low dietary calcium intake. The diet of post menopausal females is deficit in calcium by 46.7%. In case of pregnant, lactating and reproductive age group females (other than lactating and pregnant females) this figure is 30.33%, 40.47% and 34% respectively.
Conclusion:Average intake of dietary calcium is poor in all age groups of females specially the post menopausal females. Knowledge about source and importance of calcium for body among females is inadequate.
The neuro muscular symptoms arising due to inadequate calcium in diet have led to excessive use of NSAIDS and steroids for symptomatic relief.
Key words: Calcium deficiency, knowledge, NSAIDS, osteoporosis.

I. INTRODUCTION

Calcium is one of the most essential micronutrient required for proper functioning of human body.It's role is multispectral ranging anatomically from bone formation , dentition physiologically in maintaining muscles and muscle contraction[1] and in biochemical world for neurotransmission, intra cellular signalling and hormone secretion[2]. Moreover the demand of calcium is not static and drastically increase in pregnancy, lactation and growth[3]. A major concern is status of post menopausal females who are most susceptible to bone loss. It is reported that 3 out of every 4 females between the age of 50 to 60 suffer from problem of osteoporosis in India.[4]

This study has been done to estimate the amount of daily dietary calcium intake by females of various age group in Mangali area of Hisardistrict of Haryana along with their knowledge level regarding various aspects of calcium. The study also highlights the prevalence of various symptoms due to low calcium intake. Further the problem of low calcium intake is studied for various socio economic factors affecting it.

Aim and objectives:
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II. METHODOLOGY

A common set of questions were asked to females presenting in OPD of CHC situated in Mangalivillage of Hisardistrict in Haryana.Data was collected from June 2020 to August 2020. 150 females were selected randomly to answer these questions. 60 were post menopausal, 30 were lactating or pregnant. Rest 60 were of reproductive

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age group other than lactating or pregnant mothers. A performawas distributed to all these study participants to mention the type and amount of food they eat everyday. This detail was collected for 7 consequent days and the dietary calcium intake was calculated by taking average of these 7 days. Data hence collected was analysed on MS Excel. Statistical significance was set at P value < 0.05.

III. RESULTS:

As shown in table 1 ,66 (44%) females out of 150 had not consumed milk since last 5 years or more. 49 (32.66%) females were occasional consumers of milk. Only 23.33% females were found to consume milk on regular basis. Consumption of other dairy products was only occasional. Out of these 66 females who had never taken milk 44 (66.66%) were past menopausal, 4(6%) were lactating or pregnant mothers and 18 (27.27%) were of reproductive age group.

Average daily dietary calcium intake was calculated by recall method and this figure was compared by recommendations by National institute of nutrition, Hyderabad. Table 2 shows the average daily dietary intake of calcium along with amount of deficiency. Accordingly, post menopausal females consume least amount of calcium in their diet. Their diet is Calcium deficient by 46.7%.

Table 3 shows the actual number of females who are deficient in calcium intake.48 (80%) out 60 post menopausal females have deficient calcium intake in their diet. On an average they only consume 52.84% of daily calcium required which is very low. The intake by other age group females specially the pregnant and lactating mothers is also not satisfactory and is found deficient by 30.33% and 40.47% for pregnant and lactating mothers respectively.

Calcium is an important requirement for neuro muscular activities. Table 4 shows that In our study 53 (80.3%) females out of 66 who do not consume milk at all have neuro muscular symptoms like muscle pain, joint pain, weakness and easy fatigue on doing routine household work.21(42.85%) out of 49 females who consumed milk irregularly had these symptoms. This value is 34% for those who consume milk regularly. This was further tested statistically by X^2 test which was found significant (X^2=26.0329 and P < 0.00001) [Table 5]

IV. DISCUSSIONS

According to the statistical figures of our study, the calcium intake of post menopausal females is most compromised. Studies have shown that bone loss starts from the age of 30 -40 years in both males and females. In case of females it is stated that menopause is followed by an immediate decrease in bone mass and density within a year[5]. Thus it is very clear that calcium intake should be appropriate to counter balance the deteriorating bone quality in post menopausal females.

The analysis of our data shows that the diet of post menopausal females is most deficient in calcium. The status of pregnant and lactating mothers in this regards is not worth praising but is slightly better. This is attributed to the effects of ASHA and Anganwadi workers who have been insisting this group of females to modify their diet and consume more milk and dairy products. Similar results were quoted by Anant et al in their study where daily dietary intake of calcium by pregnant females was 858mg/ day. Thus clearly showing that the north Indian pregnant females consume less calcium than recommended.[6] The study by Amina ImeneBenali etal concluded with the fact that pregnant females of Algeria have deficient calcium intake.[7]

In the individual work up done in our study 93 out of 150 females were found deficient in calcium consumption. This shows that 62% females residing in urban slum consume less calcium. This figure is slightly different from the figures of study done in Karnataka by Jeffrey Pradeep Roy et al where 74.5% population was found deficient in calcium consumption.[8]

The females who did not consume milk since last 5 years or more were interrogated to find out reasons for the same. Figure 1 shows that the large family size was the greatest obstacle. This was statistically significant as shown in table 6. Thus increase of family size drastically reduces the milk consumption of females. As stated by a research held at Loyola University Healthcare System by Judith A Beto This fact is entirely different for developed countries as lactase deficiency is found to be the major cause for reduction of milk intake.[2]

Education is the most important weapon to modify human behaviour and beliefs. In order to know the impact of education on pattern of milk consumption, the educational qualification was correlated with practice of milk intake. Females with better education emphasized on regular intake of milk. Table 7 shows the statistical significance.

The study also focused on knowing the knowledge of females related to various health related aspects of calcium. As shown in table 6, this knowledge was very limited which cannot give a good driving force for better consumption of milk and dairy products. Research done previously have

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shown that the third important factor for poor daily consumption of calcium is poor knowledge on calcium rich diet and it's importance.[8]

Adequate calcium in diet is essential to maintain normal body weight, decrease the risk of obesity and helpful in promoting preventive health.[2]

Sarcopenia is a term used for loss of muscle strength and muscle mass. Milk containing adequate amount of protein and calcium can reduce the chances of sarcopenia[2]. Not only this, calcium also plays role in sound sleep as stated by Micheal A Gradren[9].Thus the females who do not consume milk are at a greater risk of developing calcium deficiency and neuro muscular symptoms. Such females also fall in the vicious trap of NSAIDS consumption. This situation becomes more fatal when the usage of NSAIDS is done regularly and without proper prescription. Some females were found to use steroid tablets (mainly Prednisone) for symptomatic relief.

In our study 21(31.8%) out of 66 females were regular users of Prednisone tablets. These tablets were prescribed by a local quack.16 out of these 21 females were encouraged by other females who were already the regular visitors of this clinic.

This is a serious health related issue as post menopausal females are at a risk of developing osteoporosis. Indian females have an early onset of osteoporosis as compared to the western counterparts[4]. Moreover glucocorticoid induced osteoporosis is the most prevalent form of secondary osteoporosis. The glucocorticoids have detrimental effects on bone formation, turn over and integrity.[10]

The integration of all these factors directly predispose the females to osteoporosis along with severe side effects of steroid intake on musculoskeletal, gastrointestinal, cardiovascular and endocrine system. Immunological side effects are also possible.[11]

V. CONCLUSION:

The average intake of dietary calcium is poor in all age groups of females specially post menopausal females Knowledge regarding source and importance of calcium is inadequate among females. The neuro muscular symptoms arising due to inadequate calcium in diet have led to excessive use of NSAIDS and steroids.

VI. RECOMMENDATIONS:

1.Females of all age groups should be educated regarding the various health related aspects of calcium and it's importance. They should be encouraged for regular intake of milk and dairy products.

2. Calcium supplements should be given to females with very low dietary intake specially post menopausal, lactating and pregnant females.

3. The use of NSAIDS and steroids for minor neuro muscular symptoms should be discouraged. People should be given adequate knowledge regarding the adverse effects of these drugs .

Diagram 1: Reasons for non-consumption of milk

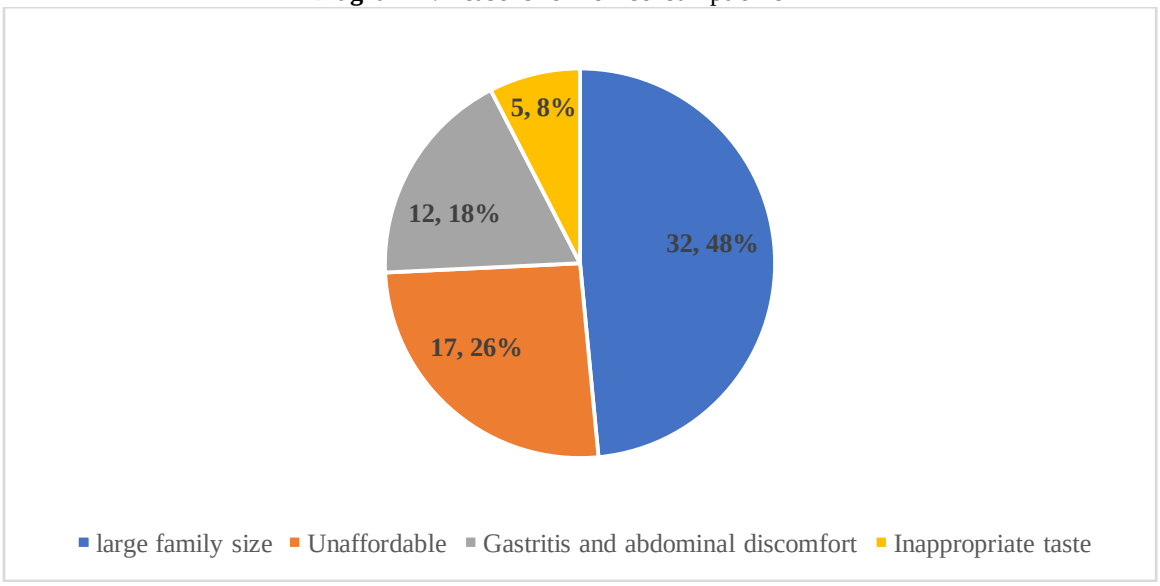

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Table 1: Habit of milk consumption in females

Habit	Number of females (150)	Percentage
Never consumed milk since 5 years or more	66	44
Occassional consumers	49	32.66
Regular consumers	35	23.33

Table 2: Average daily dietary calcium intake

Category	Recommended	Daily calcium intake	Amount of calcium deficient	Intake Percentage	Deficiency Percentage
Post menopausal	800[8]	428	372	53.3	46.7
Pregnant	1200*	836	364	69.67	30.33
Lactating	1200*	711	489	59.53	40.47
Reproductive age group	600*	396	204	66.0	34.0

*As per standards of national institute of nutrition, Hyderabad.[3]
All values in mg per day.

Table 3: Actual number of females with calcium deficiency

Category	Females with Normal calcium intake	Females with deficient calcium consumption	Percentage of females with calcium deficient diet
Pregnant and lactating (30)	22	8	26.66
Post menopausal (60)	12	48	80.0
Reproductive age group (30)	23	37	61.66

Table 4: Presence of neuro muscular symptoms and pattern of milk consumption

Pattern of milk consumption	Number of females	Females with neuro Muscular symptoms	Percentage
No intake	66	53	80.30
Irregular consumption	49	21	42.85
Regular consumption	35	12	34.28

Table 5:Correlating habit of milk intake with presence of neuro muscular symptoms

Presence of neuro-Muscular symptoms	Habit of milk consumption		
	No consumption	Occasional	Regular
Yes	53	21	12
No	13	28	23

(Value of X^2 is 23.0329 with p value < 0.00001. Result is significant at p <0.05)

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Table 6: Knowledge of females regarding important aspects of calcium

Calcium related fact	Females having knowledge (Out of 150)	Percentage of females having this knowledge
Role of calcium	46	30.66
Sources of calcium	79	52.66
Daily requirement of calcium	03	2.0
Symptoms of calcium deficiency	10	6.66
Events when demand increase	42	28.0

Table 7: Correlating family size with milk consumption habit

Regularly drinking milk	Number of family members		
	Upto 5	6 to 10	11 or more
Yes	53	21	10
No	7	20	39

(Value of X^2 is 51.029 with p value <0.00001. Result is significant at p <0.05)

Table 8: Correlating education status with habit of milk consumption

Regular intake of milk	Educational status		
	Uneducated	Upto X	XII and above
Yes	18	17	49
No	39	14	13

(Value of X^2 is 27.1615 with p value <0.00001. Result is significant at p <0.05.)

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