ORIGINAL ARTICLE

Vitamin D Deficiency among Pre-Menopausal Women Attending OPD with Generalized Body Aches and Pains

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ABSTRACT

Aim: To determine among premenopausal females the prevalence of Vitamin D deficiency with presentation of chronic musculoskeletal pain in medical OPD of Jinnah Hospital Lahore.
Methods: One hundred Pre-menopausal females with regular menstrual cycles who are born in urban Pakistan with symptoms of generalized aches and pains were screened between 1st April 2012 and 30th September 2012 for Vitamin D deficiency. Subjects with epilepsy, hypercalcemia, Liver or Renal impairment, diarrhoea and Vitamin D replacement were excluded
Results: Out of 100 premenopausal women of age 20 to 40 years with mean age of 28 years, **87%** were Vitamin D deficient i.e. serum alphacalcidiol level less than 15ng/ml. 44% were married and 33 women were having children. There was no significant relationship between Vitamin D efficiency and marital status or number of children or age groups.
Conclusion: Consideration of Vitamin D deficiency during consultations for chronic musculoskeletal pain is essential. There should be fortification of food with Vitamin D to control this epidemic.
Keywords: Vitamin D deficiency, musculoskeletal pain, premenopausal women

INTRODUCTION

Bone disease osteomalacia is described as bone demineralization due to vitamin D deficiency or its impaired metabolism[1]. Osteomalacia is more prevalent in hilly areas of Pakistan like Hazara where its prevalence is 3.6%[2]. Osteomalacia is taken from Greek: osteo- meaning "bone" amd malacia denote "softness". It causes a defect in mineralization of protein framework known as "osteiod" Osteomalacia in children is known as Rickets (prior to epiphyseal fusion) and so term osteomalacia describes milder adult form of disease[3].

Vitamin D deficiency clinical syndrome can be due to less production of vitamin D in skin, absence of dietary intake, increase loss of vitamin D, impaired activation of vitamin D or resistant to 1, 25 $(OH)_2$ D biologic effect. It can present with signs of diffuse body pains, muscle weakness and frail bones and waddling gait occasionally[4].

Diagnosis of osteomalacia is made by increased serum alkaline phosphatase, plasma calcium normal/low, serum phosphate low, serum 25(OH)D and serum1,25 $(OH)_2$D are usually low. X-rays are often normal in adults but may show defective mineralization specially in the pelvis, long bones and ribs with pseudo fractures[5,6,7].

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When there is nutritional deficiency of vitamin D, replacement doses of native vitamin should be given. Monitoring of serum calcium, alkaline phosphatase and renal function should be undertaken regularly to screen for hypercalcemia. Best measure of healing is normalization of alkaline phosphatase[6].

Vitamin D deficiency study done in Pakistan included cases of rickets and osteomalacia and in addition subjects with vitamin D deficiency. The study was performed on 195 premenopausal Pakistani women. Standard laboratory techniques were used to measure 25-hydroxy-cholecalciferol and iPTH levels. Among premenopausal women it was found that to keep iPTH below 53pg/dL, minimum level of vitamin D required was found to be 16ng/ml with a mean of 15.20±13.37[2].

Vitamin D concentrations are directly affected by several individual characteristics and environmental factors specially diet, sunlight exposure, cigarette smoking, high BMI (as an indicator of obesity), and oral contraceptives usage[7,8].

Low dietary intake of calcium and indoor lifestyle of females in our culture and setting causes higher risk of low vitamin D and bone mineral status in our females and go unnoticed for years this study want to highlight this treatable condition among premenopausal women so that early diagnosis and prompt treatment can be carried out.

SUBJECTS AND METHODS

This cross-sectional survey was conducted at the medical outpatient department, Jinnah Hospital, Lahore from 1st April 2012 to 30th September 2012

and comprised 100 cases. pre-menopausal females with regular menstrual cycles and normal CBC (12-16g/dl), ESR (0-10), age between 20-40 years and symptoms of generalized aches and pains were included. Patients with history of intake of vitamin D supplements/ calcium during the past four weeks, more than three times the upper normal limit (35-45) of liver enzymes, blood urea more than twice the upper normal limit (100-150mmol/L) with renal impairment and serum calcium more than 10 mg/dl were excluded. Fasting blood samples was drawn with the help of Tourniquet and disposable syringe by a nurse. Then samples were sent to Mayo hospital laboratory for serum calcidiol, i.e., calcidiol level. Laboratory reports were assessed for presence or absence of Vitamin D deficiency. Data was entered in SPSS version 19 and analyzed.

RESULTS

Mean age of the respondents was 28.4±5.58 years and mean vitamin D3 level was 12.14±4.1 ng/ml. 44% of respondents were married women while 56% were single (Table 1). When the Vitamin D deficiency was cross tabulated against marital status, statistically the difference was non-significant (Table 2). Vitamin D 3 categories and marital status was cross tabulation of Vitamin D (Table 3)

Table 1: Demographic information of the subjects

Variable	No.	%
Vitamin D3		
Deficient vitamin D	87	87.0
Normal vitamin D	13	13.0
Mean±SD	12.14±4.10	
Age (years)		
> 30	31	31.0
<30	69	69.0
Mean±SD	28.46±5.58	
Marital status		
Married	44	44.0
Single	56	56.0

Table 2: Comparison of vitamin D3 with marital status

Vitamin D status	Marital status	
	Married	Single
Deficient Vitamin D	37	50
Normal vitamin D	7	6
Using Chi square test = p = 0.259		

Table 3: Comparison of marital status with vitamin D3 according to age

Marital status	> 30 years	<30 years
Married		
Deficient vitamin D	25	12
Normal vitamin D	6	1
Single		
Deficient vitamin D	-	50
Normal vitamin D	-	6

DISCUSSION

In our study, in premenopausal women presenting with aches and pains in medical outdoor of Jinnah Hospital, Lahore the prevalence of vitamin D deficiency was 87%. It shows the tip of hidden iceberg. This pandemic of vitamin D deficiency is worth preventing. In many studies low winter vitamin D has been shown due to seasonal variation in serum vitamin D levels[9,10]. We collected data in spring/summer season so seasonal variation was not an issue with our respondents.

In women of child bearing age and hence children the high prevalence of low vitamin D is a major concern. There was negative correlation of maternal serum vitamin D levels with PTH level and positive correlation with cord blood Vit. D levels[11]. This shows a heavy burden on developing countries like Pakistan. If this disease is not prevented, it will quadruple the existing malnutrition. In immigrant study in Oslo, low vitamin D prevalence was higher in Pakistani born individuals and lower in Vietnam born compared to other ethnic groups. In the groups studied important determinant factors of vitamin D status were fatty fish intake and cod liver oil supplements[12].

The regions around equator don't have such a vast epidemic as in our population. High serum levels of calcidiol, were shown in one small study in Thailand, perhaps linked to its geographical location near the equator. Confirmation of this is required by further studies. In various studies the differences in serum calcidiol assay methodology can be associated with these alterations to some extent[13]. **I**n Japan, vitamin D status overall is comparatively better in regions in South Asia and undoubtedly linked to fish consumption[14]**.**

In developing countries hypovitaminosis D is associated with several risk factors. Especially age groups (neonates, preschool children or the elderly) and female sex were the most frequently revealed risk factors for hypo vitaminosis D. Obesity is a rising endemic health issue, which is speedily increasing in developing countries. In Pacific Island populations vitamin D levels correlated negatively with BMI and fat mass, findings that are consistent with the established hypothesis that adipose tissue is a depot for vitamin D. Melanin behave as a natural sunscreen and diminishes during sunlight exposure the production of pre vitamin D in human skin.

It was shown by Lo et al[15] that capacity of Asian Indians and Pakistanis to synthesize Vitamin D in their skin is same as white individuals but require greater exposure to produce a similar response. Covering up clothing style was a persistent predictor

of low Vitamin D levels in the Middle East, East Asia and North Africa.

CONCLUSION

It was found that in premenopausal women there is high prevalence of Vitamin D deficiency showing high need of preventive and education plan. More research work is emphasized to dig out problems and causes of this deficiency.

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