

Low Backache in Veiled Multipara Women: Prevalence and Response to Treatment

Saadia Sultana*, Muhammad Nadim Akbar Khan** and M Saleem***

Departments of * Gynecology & Obstetrics, ** Chemical pathology and *** Anesthesia
Railway Teaching Hospital Rawalpindi

Background: The deficiency of vitamin D is unexpected in a tropical country like Pakistan, as there is abundant sunlight available. Vitamin D deficiency leading to hypocalcaemia and low backache is common in veiled multipara in northern areas of Pakistan. We designed a study to see the prevalence of low backache in these areas and their response to a cost effective treatment.

Objective: To determine the prevalence and etiology of low backache in completely veiled multipara women of northern areas of Pakistan and its response to a cost effective treatment.

Design: Prospective interventional study.

Setting: The Pain management team of Anesthesia and Obstetrics and Gynecology Departments of Railway Teaching Hospital Rawalpindi along with other hospital Staff surveyed the earthquake affected Northern Areas of Pakistan.

Duration of study: May 2008 to April 2009.

Subjects and methods: 160 completely veiled multipara women, of northern areas of Pakistan; aged 20-45 years, suffering from low backache were included in the study. A questionnaire was used to investigate clinical characteristics, parity, exposure to sunlight, breast feeding, whether or not they wore the veil and menopause. The intensity of pain was measured by using Visual Analogue Scale (VAS). X- Rays lumbosacral spine AP and Lateral view were done. We divided them into two groups with 80 women in each group. Group A was subjected to cost effective treatment and counselling. Group B was used as control, and they were not treated or counselled. Group A responded miraculously to simple and cost effective empirical treatment including calcium, vitamin D, counselling about diet, exposure to sun and an active lifestyle. The intensity of low backache was again measured at the end of six months by the same VAS. The pain of group A women were dramatically relieved but Group B showed little or no improvement in their symptoms. The results were statistically significant.

Conclusions: In spite of abundant sunlight, healthy individuals in Northern areas of Pakistan are vitamin D deficient which ultimately leads to hypocalcaemia and osteoporosis. Healthy diet, change in life style like sunlight exposure and cost effective treatment can significantly reduce the complaints of low backache.

Key words: Osteoporosis, backache, Vitamin D, sunlight, dietary calcium

Introduction

Vitamin D deficiency is much more common at high altitudes where there are few hours of sunlight. Vitamin D status is highly different in various countries of Europe, the Middle East and Asia. ¹ In a tropical country such as Pakistan, where there is abundant overhead sun for almost all of the year; Vitamin D deficiency is unexpected.

Since cholecalciferol is derived largely from the action of ultraviolet light on skin.² Nevertheless, vitamin D deficiency was reported in some low altitude countries including Indo-Pak subcontinent, Saudi Arabia and

Address for Correspondence: Dr. Saadia Sultana

in a way which prevents exposure of their skin to ultraviolet radiations.³ A veiled lady of our northern areas, in addition to her normal clothes which covers all her body, has to cover her body including head and neck, upper and lower limbs down to the hands and feet. She has to wear thick black gown and cover her face with a double layered black veil when she goes outdoors. Eyes are left uncovered or covered with semi-translucent black cloth. These women are forced to lead indoor life most of the time. This leads to, hypovitaminosis D, resulting in hypocalcaemia and

severe osteomalacia. Grand multiparity which is known to be associated with depletion of the maternal calcium and phosphorus stores is very common in this region. This study was stimulated by the observation of few cases of unexplained low back pain in otherwise healthy young veiled Pakistani women.

Patients with backache should be counseled to follow a diet that provides proper amount of calcium, vitamin D and proteins. High calcium foods include low-fat milk, yogurt, ice cream, cheese and leafy green vegetables, such as spinach. Moreover calcium and vitamin D supplements can also be recommended.⁴⁻⁶ Recent studies indicate that vitamin D supplementation of >2000 IU/day is safe and effective in achieving vitamin D sufficiency in men and non-pregnant women.^{7,8} Studies are underway in the US to establish vitamin D requirements during pregnancy.⁹

Strategies to prevent vitamin D & calcium deficiency by their adequate intake in women and throughout childhood would not only prevent rickets but may also reduce the risk of osteoporosis as well as other long-latency disease processes that have been associated with vitamin D deficient states in adults.¹⁰ In a Saudi Arabian study it was concluded that Vitamin D deficiency is an important treatable cause of osteomalacic myopathy.¹¹ Osteoporosis results from reduced bone mass and disruption of the micro-architecture of bone, giving decreased bone strength, aches and pains especially backache and also the risk of fracture increases, particularly of the spine, hip, wrist, humerus, and pelvis.^{12,13} The risk of fractures increases steeply with age. Globally, osteoporotic fractures caused an estimated 5.8 million disability adjusted life years in the year 2001 and are also associated with increased mortality.¹⁴

Subjects and Methods

382 women were initially recruited for the study; many were reluctant to accept clinical examination or to give blood and urine samples. Ninety Seven were excluded due to medical, dietary or social causes. 160 apparently healthy multipara, 20-45 years, from the middle or low social class, having low backache were included. They were free of other systemic symptoms except backache, receiving no medications and had no history of gastro-intestinal, hepato-biliary, renal or hereditary bone diseases. Renal, Hepatic and other systemic diseases were excluded by investigations like serum total calcium, Vit D, Serum Urea, Creatinine, ALT, and Blood Complete Picture.

After oral informed consent by the subjects, approval from the institutional ethical committee was obtained.

Backache was measured by using VAS in all the patients at the start of study. This is a very simple technique and very easy for an uneducated lady to understand. VAS is in the form of a scale on which markings from 1-10 are given. Patient was told that '1' is minimum pain and '10' is maximum pain. She has to point her amount of pain on the scale at start and end of three months time. Backache of 4 and more was considered as painful and less than or equal to 3 as relieved. Serum urea, serum creatinine, serum ALT, urinary proteins, pH and microscopy were done for all subjects to exclude renal and hepato-biliary disorders. X-Rays of lumbo-sacral spine were advised to the individuals. On X- Rays, 108 out of 160 showed demineralization and changes suggesting osteomalacia/osteoporosis. Serum Calcium (total) and serum Vitamin D-3 of all the women of both group A and B were carried out at the start and 6 months later.

The study population was divided into two groups, each comprising of eighty women. Group A was subjected to cost effective treatment of backache with calcium 1000 mg/day, vitamin D 2500 IU/day and they were counselled about high protein & calcium diet and sun exposure. Group B subjects were not given any medications for the backache and they were not counselled about diet and exposure to sun light. After six months interval the intensity of backache was measured by the VAS in both the groups.

Statistics

Outcome data of one hundred and sixty women was available. Data are presented in tables. Statistical analysis was conducted by using SPSS for windows software (version 11.0). Proportions were compared by using the chi-square test. Groups were compared by using Student's *t* test. Unpaired student *t* test was used to compare age and number of children and the levels of backache. *P* value ≤ 0.05 was taken as significant.

Results

X-ray bone showed 69 (86.25%) cases of osteomalacia in group A, and 72 (90.00%) in group B (**Table I**). This table is also showing that 100% of women in both the groups are suffering from low backache according to cut off level of VAS as this is the main inclusion criteria of the study. Blood urea, serum creatinine, and serum ALT were normal in all patients. Urine examination for proteins, pH and microscopy was normal.

All patients responded dramatically to the administration of Calcium, Vitamin D, multivitamins, dietary advice and sun exposure. In six months time their

backache was relieved & radiological bone lesions healed almost completely. An X-ray bone after six months of empirical treatment and counseling showed 9 (11.25%) cases of demineralization in group A (Table II). In control group (group B) in which veiled women having backache were not given any medication or counseling, 69 (86.25%) still showing findings of osteomalacia (Table II) (*p*-value 0.004). The dramatic response of backache to a daily dose of 2500 IU of vitamin-D and 1000 mg of calcium suggests the diagnosis of vitamin-D deficiency resulting in hypocalcaemia and osteoporosis/osteomalacia. Table III shows marked deficiency of Serum Calcium and serum Vit-D3 in all the women of both group A and B. However Serum Ca and Vit-D3 were significantly improved in 94 % and 91% women respectively in group A. Whereas in group B the number of women with deficiency of Serum Ca increased from 80% to 89% and deficiency of Vit D-3 increased from 78% to 86%; because they were neither given Vit-D or Calcium supplement nor they were counseled for exposure to sunlight. So the Serum calcium and Vit-D deficiency is confirmed in these individuals suffering from low backache. The statistical analysis revealed a significant change of serum Calcium and vit-D3 in both the groups.

Table I: Age, X-Ray findings and Backache measured on VAS in study population at the start of study (n=160)

Variable	Group-A (n= 80)	Group-B (n= 80)	P value
Age (years) 20-45	32.02 (Mean age) (+/-7.1)	32.10 (Mean age) (+/-7.4)	0.77
X-Ray (Osteomalacia)	69 (86.25%)	72 (90.00%)	0.63
Backache (VAS) at the start of study ≥ 4	80 (100%)	80 (100%)	-

VAS: Visual Analogue Scale

Table II: Backache measured on VAS and X-Ray findings after vitamin D supplementation

Variable	Group-A (n= 80)	Group-B (n= 80)	P value
X-Ray (Osteomalacia)	9 (11.25%)	69 (86.25%)	0.004
Backache (VAS ≤ 3) after 6	71 (88.75%)	11 (13.75%)	0.001

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VAS: Visual Analogue Scale

Table II also shows the value of empirical treatment as 71 (88.75%) women are relieved (VAS ≤ 3) of the backache in group A & only 11 (13.75%) in group B has Visual Analogue Scale ≤ 3 (*p*-value 0.001).

Table III: Lab result of serum Calcium-total and Vit D-3 in Study Population at the start and three months later

Lab investigation	Group A (n=80)			Group B (n=80)		
	At the start of study	After 6 months	P value	At the start of study	After 6 months	P value
Serum Ca-total (<8.6mg/dl)	61 (76%)	05 (6%)	0.003	64 (80%)	71 (89%)	0.56
Serum Vitamin D : 25 (OH)D (<12ng/ml)	66 (82%)	07 (9%)	0.002	62 (78%)	69 (86%)	0.59

Discussion

Our study presents the first body of data on the prevalence, etiology and response to empirical treatment in a population serving from low backache who is observing purdah (veil) in a tropical country. The most important finding in our study is the unexpectedly high prevalence of backache in otherwise healthy ladies. The explanation could lie in the prolonged deficiency of dietary calcium intake among poorer parts of Pakistan because of the expensive nature of milk and milk products.¹⁵ In these areas the dietary deficiency of calcium is complimented by non-exposure to sunlight, which is very important for the synthesis of Vitamin D-3 which caused the absorption of Calcium from GIT. Dietary calcium deficiency has been shown to lead to secondary vitamin D deficiency in rats.¹⁶ Similar findings are also suggested in studies on humans.^{17,18} Hypovitaminosis D and osteomalacia among South Asian women have been widely reported.¹⁹ However, all studies but a few were from temperate regions such as the United Kingdom and Norway, where the already low availability of overhead sun is compounded for Asian women by poor outdoor activity, pigmented skin, and excessive clothing.²⁰ Further studies are needed to document direct evidence of improvement in serum 25(OH) D with calcium supplementation in large numbers of subjects in our region. These facts should make practitioners and health authorities aware of vitamin D deficiency as a health problem in these sunny countries.²¹ A recent study in

Netherland concluded that vitamin D deficiency and insufficiency are globally still very common especially in risk groups such as young children, pregnant women, elderly and immigrants.²²

Vitamin D deficient diet and lack of exposure to sunlight are the most common causes of osteomalacia and osteoporosis.²³ Osteomalacia is an end-stage bone disease of chronic and severe Vitamin D or phosphate depletion of any cause. ²⁴Other causes include renal disease, malabsorption, liver disease, drugs that enhance catabolism of 25-dihydroxy cholecalciferol such as phenytoin, phenobarbitone and drugs that interfere with calcium and phosphate absorption such as aluminium hydroxide and magnesium oxide used as antacids. All our patients were young-middle aged, veiled otherwise healthy women. Causes of osteomalacia other than dietary and vitamin D deficiency were carefully ruled out. Renal disease, liver disease and hereditary bone diseases were excluded as well. Signs of osteomalacia/osteoporosis were founds in X-rays of almost all patients. The dramatic response to calcium, vitamin D, diet and exposure to sunlight confirms the diagnosis of vitamin D deficiency resulting in hypocalcaemia and osteoporosis/ osteomalacia causing low backache in the study population.

Further population study is needed to find the prevalence of osteomalacia among veiled women in this area, which we expect to be high particularly among grand multipara. We recommend adding adequate vitamin D supplementation in the diet (milk and milk products) marketed in this region as prophylaxis and counseling of patients regarding exposure to sunlight. Grand multiparity, frequent gestations, prolonged lactation which is known to be associated with depletion of the maternal calcium and phosphorus stores is very common in this region. Therefore, we recommend screening of all veiled women in northern areas of Pakistan by checking 25 (OH) D plasma level to detect subclinical vitamin D deficiency, particularly in women who had two or more previous pregnancies.

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