INTRODUCTION

Vitamin D deficiency is an important public health problem in both developing and underdeveloped countries and is considered to be the most common nutritional deficiency and one of the most common undiagnosed medical conditions in the world. Vitamin D is a fat-soluble, sunshine hormone needed during infancy, adolescence, adulthood, and pregnancy as it is required for normal calcium absorption from the gut and bone growth. Sunlight is the best source of Vitamin D and its presence in food is limited. Cutaneous synthesis of vitamin D is obtained by the conversion of 7-dehydrocholesterol to cholecalciferol by ultraviolet sunlight.

Majority of the people in the world, approximately 90% of vitamin D is synthesized in this way and the remaining 10% may obtain exogenous from nutrients or supplements. Nutritionally, vitamin D (25-OH) rich foods are fatty fish, eggs, cod liver oil, and 25-hydroxyvitamin D fortified supplements. Vitamin D (25-OH) has an endocrine role in the absorption of calcium by the intestine and is to be taken up to the blood stream. Generally two forms of vitamin D (25-OH) exist which refer to vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). Occurrence of vitamin D (25-OH) deficiency is high and is now documented as a worldwide health problem. An estimated calculation shows that about 1 billion people worldwide are deficient or have insufficiency. One of the most contributing factors is thought to be due to developmental changes has shifted our lifestyle to urbanization and insufficient diet supplementation. In blood, the concentration of vitamin D (25-OH) is commonly used as a biomarker for vitamin D profile with a half-life of approximately a few weeks. Making it an ideal marker to measure whether a patient is vitamin D deficient, sufficient,
or intoxicated, a normal level of vitamin D (25-OHD) is essential to maintain bone metabolism. The chronic deficiency of vitamin D leads to diminution of bones reservoirs of phosphate, calcium, and inadequate bone matrix mineralization, which is a risk factor for rickets in children and osteomalacia in adults. Subsequent investigations proved its role in the protection of the older from osteoporosis. Vitamin D (25-OHD) has an endocrine role in the absorption of calcium by the intestine and is to be taken up to the bloodstream. Vitamin D (25-OHD) exists in two forms which refer to vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol).

The importance of vitamin D in body metabolism and many immune functions has been well established and proven through literatures. Previous studies demonstrate the relation between vitamin D deficiency and various medical disorders like depression, diabetes type 1, syndrome, as well as chronic widespread muscle and bone pain. And even in infancy, it causes rickets and hypocalcemia fits. There are several factors has been linked to vitamin D deficiency in infancy like a low diet of vitamin D and decreased sunlight exposure due to fear of cancer, pigmentation, or weather variation.

METHODS

This was a hospital-based retrospective study conducted among OPD and IPD patients visiting B&C Medical College Teaching Hospital & Research Centre, (B&CMCTHRC) Jhapa, Nepal from January 1st to 31st December 2021. Data has been collected from the Biochemistry central laboratory computer software. All the collected data were compiled and entered in MS-excel. Statistical package for social science (SPSS-16.0) was used for data analysis. Data were presented as mean± SD. Statistically significance was calculated using the Chi-square test and p-value <0.05 was considered significant.

RESULTS

In our study population total subjects were 7,402 of which male was 2,488 (33.6%), and female was 4914 (66.4%)  Mean, Std. deviation value of male was 29.06±16.51 while the female was 24.29±14.82. Age range from <15 years to >62 years in the different age groups and statistically significant with p- the value of 0.00. In the age group, 47-62 years is the highest 38.09% and 31-46 years and the second-highest 29.18% were suffering more vitamin D deficiency. Mean and Std. The deviation value of this age group were 26.41±15.63, 24.36±14.32 respectively.

In table 2 & fig 3 shows according to gender i.e male and female. It was also categorized as sufficient, insufficient, and deficient in different gender i.e., male and female. In the case of male deficient were 32.4% and 30.5% insufficient while in the case of females 48.4% were deficient and 28.4% were insufficient. Sufficient cases in males and females were 36.9% and 23.1% respectively. Statuses of vitamin D females are more deficient 48.4% compare to male 32.4% deficient.

In table 3, 4 & fig 4&5 shows 43.1% deficient while 29.2% insufficient and only 27.8% were sufficient of the total study population. Vitamin D deficiency in the age ranges from the different
group were <15 years, 15-30, 31-46, 47-62 and >62 years in which deficient were 41.2%, 52.8%, 47.5%, 40.6% and 36.4% while insufficient were 33.8%, 28.8%, 28.1%, 31.2%, 27.8% and sufficient were 25.0%, 18.4%, 24.4%, 28.2% and 35.8% respectively. In our study it was observed that in male and female was a more difference regarding vitamin D level as shown in table 1&2.

Table 1: Vitamin D status according to Gender and different age group N= (7402)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2488</td>
<td>33.6</td>
<td>29.06±16.51</td>
</tr>
<tr>
<td>Female</td>
<td>4914</td>
<td>66.4</td>
<td>24.29±14.82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age group (Years)</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;15</td>
<td>140</td>
<td>1.99</td>
<td>25.04±13.78</td>
</tr>
<tr>
<td>15-30</td>
<td>914</td>
<td>12.34</td>
<td>22.48±13.63</td>
</tr>
<tr>
<td>31-46</td>
<td>2160</td>
<td>29.18</td>
<td>24.36±14.32</td>
</tr>
<tr>
<td>47-62</td>
<td>2302</td>
<td>31.09</td>
<td>26.41±15.63</td>
</tr>
<tr>
<td>&gt;62</td>
<td>70</td>
<td>25.37</td>
<td>28.77±17.28</td>
</tr>
<tr>
<td>Total</td>
<td>7402</td>
<td>100</td>
<td>25.90±15.57</td>
</tr>
</tbody>
</table>

Table 2: Vitamin ‘D’ deficiency In Gender (N=7402)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Deficient</th>
<th>Insufficient</th>
<th>Sufficient</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>808</td>
<td>761 (30.5)</td>
<td>919 (36.9)</td>
<td>2488 (33.6)</td>
</tr>
<tr>
<td>Female</td>
<td>2379</td>
<td>1399 (28.4)</td>
<td>1136 (23.1)</td>
<td>4914 (66.4)</td>
</tr>
<tr>
<td>Total</td>
<td>3187</td>
<td>2160 (29.2)</td>
<td>2055 (27.8)</td>
<td>7402 (100)</td>
</tr>
</tbody>
</table>

Table 3: Status of vitamin D among the patients (N=7402)

<table>
<thead>
<tr>
<th>Status of Vitamin ‘D’</th>
<th>Frequency (f)</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient</td>
<td>3187 (43.1)</td>
<td>14.14±3.99</td>
</tr>
<tr>
<td>Insufficient</td>
<td>2160 (29.2)</td>
<td>24.49±2.76</td>
</tr>
<tr>
<td>Sufficient</td>
<td>2055 (27.8)</td>
<td>45.60±15.57</td>
</tr>
<tr>
<td>Total</td>
<td>7402 (100.0)</td>
<td>2590±15.57</td>
</tr>
</tbody>
</table>
DISCUSSION

In this study, we observed a high prevalence (66.4%) of vitamin D deficiency in females, the result is almost similar to Regmi et al 74.2% and Shrestha et al 78.2% reported29-30. Other few studies that have investigated vitamin D status in a different group of the population of Nepal were 73.68% in Kathmandu valley and 59.8% in lactating mothers of Bhaktapur31. Other Asian countries i.e. India (84-100%), Saudi Arabia (98.1%), Korea (59.1%), Malaysia (35.3%) also have a prevalence of vitamin D deficiency31-33 the Asian diet with its paucity of foods containing vitamin D and high phytate content may be the cause of the rise in vitamin D deficiency in this region. Among total deficient patients of our study, we found 43.1% cases in a deficient category.

Globally the deficiency of vitamin D is one of the public health issues and females are more sufferers than males. In our study low level of vitamin D level, 66.4% were female which is a serious issue and correspondence with finding conducted in Libya28. Another study vitamin D deficiency in female34 they found 73%. Several factors have been postulated for the relatively low level of vitamin D in females including prolonged indoor stay, sunscreen use, lack of sun exposure, pregnancy, and lactation35.

It was a hospital-based study in which we included the age group <15 years to >62 years. In this study, results showed that the majority of the patients of female are more than male of vitamin D deficiency. It also shows in table 4 the age group 15-30 years highest deficiency of vitamin D 52.8% while second highest were 47.5% in the age group of 31-46 years.

Vitamin D (25-OHD) deficiency is an innovative worldwide emerging problem among all age groups36-38. Vitamin D is used as a biomarker for bone metabolism. When the level of vitamin D (25-OHD) decreases <10ng/ml, the physicians prescribe for taking sufficient doses constituting 50,000 IU of vitamin D weekly up to 2-3 months39. Vitamin D (25-OHD) enhanced profiles are necessary for muscle strength.

CONCLUSIONS

Based on our study revealed that females are more likely to have deficient vitamin D levels due to their lifestyle, insufficient diet, and less exposure to sunlight. We recommended that need to survey epidemiological in the overall population of vitamin D level and the factors associated with these conditions.
REFERENCES


