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REDUCED VITAMIN D3 & PREVALENCE OF OPMDs – An Exceptional Correlation

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ABSTRACT: Oral cancer (OSCC) has become a serious health problem with an increasing incidence worldwide. Many researchers have studied the potent anti-cancerous action of vitamin D and its association with several cancers including OSCC. One potential option to reduce the morbidity and mortality of oral cancer is vitamin D. In addition to calcium and phosphorus homeostasis, vitamin D promotes cell growth, helps to regulate inflammation, prostaglandin synthesis and apoptosis, and inhibits metastasis through a variety of mechanisms that affect growth factors. Several preclinical studies strongly support the cancer prevention properties of vitamin D because of its pro-apoptotic, anti-proliferative, and anti-angiogenic performances against a wide range of cancer cells. Several studies that focused on genetic polymorphisms and the expression of the 1,25 dihydroxyvitamin D3 receptor (VDR) suggested significant associations with vitamin D and increased oral cancer risk and worse survival rates. In this study summarized here, we have evaluated and analysed a correlation between the serum vitamin D levels and how does its reduction causes prevalence of oral potentially malignant disorders such as oral lichen planus (OLP), oral submucous fibrosis (OSMF), leukoplakia, erythroplakia and even a traumatic ulcer which are much potent in turning into an oral squamous cell carcinoma if not treated.

Keywords: *vitamin D, OPMDs, OLP, oral cancer, carcinogenesis, candidiasis, OSCC*

1. INTRODUCTION:

Oral cancer or oral squamous cell carcinoma (OSCC), a part of oropharyngeal squamous cell carcinoma (OPSCC) is one of the most common malignancies of the world. Worldwide, lip and oral cavity cancer is the 17th most common neoplasm, with approximately 377,713 new cases and over 177,757 deaths estimated in 2020.[1] Incidence and mortality rates are consistently higher among males than females. The annual incidence rate per 100,000 individuals is 6.0 for males and 2.3 for females.[1,2] The mortality rate is 2.8 for males and 1.0 for females.[3] The risks associated with oral cancer include male sex, genetic and epigenetic factors, tobacco use, alcohol use, betel quid chewing, human papillomavirus infection (HPV), bacterial infections, and immunosuppressive agents. Often first diagnosed by dentists, treatment options for oral cancer depend on the stage and tumour type and can include surgery, radiotherapy, chemotherapy, and gene therapy.[4,5] The clinical recognition and evaluation of oral mucosal lesions can detect up to 99% of oral cancers and premalignant lesions, and early detection remains the most important determinant of the treatment outcome in oral cancer.[6] Despite opportunities for early intervention, the disease burden for oral cancer continues to be substantial.

Vitamin D (VitD) is a derivative of fat-soluble steroids (also known as 1,25-dihydroxy-vitamin D3 (1,25(OH)2D3)) that can be divided into vitamin D2 and vitamin D3.[7,8] The body acquires vitamin D mainly through UV radiation and only a small portion is obtained from food. One of the most important effects of vitamin D is its ability to regulate calcium and phosphorus metabolism and promote bone mineralisation and calcification.[9] Increasing epidemiological data suggest an important role of VitD signalling in cancer development and progression, and experimental studies demonstrate that the active VitD metabolite 1α,25-dihydroxy-VitD3 (1,25D3), has broad antitumour activity. The 1,25-Dihydroxy-VitD3 exerts a suppressive effect on kidney cancer cells via upregulation of FOXO3.[10] Vitamin D analogues suppress Insulin growth factor-I signalling and promote apoptosis in breast cancer cells. All these results indicate that vitamin D may play an important role in the prevention and treatment of tumours.[11]

As per NCPR, India houses 1/3rd of the total oral cancer cases worldwide. In India, oral cancer accounts for 30% of total cancer burden.[12] The etiopathology of oral carcinoma has always been an enigma to the pathologists. Several etiological factor in the name of carcinogen, co-carcinogen, promoters has found their association in etiopathogenesis of oral squamous cell carcinoma.[13,14] Vitamin D and its receptor (VDR) are widely accepted and appreciated for their irreplaceable role in calcium and phosphate metabolism and for maintaining proper homeostasis.[15] Recently, vitamin D and its receptor is gaining increasing acceptance in etiopathogenesis of OSCC. Certain experiments have shown an inter-connection between optimum serum vitamin D3 level and cancer prevention in a population native to Central Europe.[16] Certain studies have also proven the most anticipated anticancer potential of vitamin D3 which encompasses actions like induction of apoptosis, inhibition of angiogenesis, differentiation, stimulation, invasion and metastasis inhibition, anti-inflammatory effect. There are experimental evidences of expression of Vitamin D receptor (VDR) in precancerous lesions of oral squamous cell carcinoma (OSCC).[17,18] The proposed hypothesis of that survey suggest a potential chemoprevention of OSCC by natural or synthetic vitamin D3 in VDR positive precancerous lesions. Inspite of such increasing importance, there's little known clinical studies evaluating the role of serum vitamin D3 in prevalence of OSCC and oral pre malignant lesions in Indian population.[19,20,21] Clinical studies always abridge theoretical knowledge with the practical scenario.

In this short cross sectional study we will estimate Serum vitamin D3 level quantitatively using sandwich ELISA technique.[22] Provisional potentially malignant intraoral lesions as well as oral carcinomas will be confirmed histopathologically. Later on a thorough statistical analysis will be conducted based on the obtained results.[23] This study aims to find the interrelationship in terms of specificity and sensitivity of potentially malignant intraoral lesions and oral cancer towards Serum Vitamin D3 level.[24,25] This study will hopefully contribute to our better understanding of the vast complexities of OSCC and Vitamin D3 as one of its anticipated etiology. If a strong interrelationship is thus proven, it may act as a very potent tool further enabling us to understand the nature of oral carcinoma and also may lead towards a probable new horizon of chemoprevention and treatment approach.[26]

The objective of the study is as follows:

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1. To understand the correlation between serum vitamin D3 level and oral cancer and potentially malignant lesions.
2. To identify whether people with low vitamin D3 come under high risk population.
3. Effectiveness of Vitamin D3 in prevention and treatment of oral cancer and potentially malignant condition.

2. MATERIALS & METHODOLOGY:

The following materials were needed for the study:

- **Dental checkup set:** mouth mirror, dental probes, tweezer and cotton roll.
- **For blood collection**: syringe, vial, tourniquet, cotton, rubbing alcohol and gloves.
- **For quantitative estimation of serum vitamin D3:** ELISA TEST KIT

  Materials provided with the test kit:

  1. Coated Microwells: Microwells coated with monoclonal anti- -25-OH Vitamin D antibody.
  2. Vitamin D Sample Diluent. (Ready to use.)
  3. Vitamin D Enzyme Conjugate. Ready to use.
  4. TMB Substrate. Ready to use.
  5. Stop Solution. Ready to use.
  6. Two levels of controls (Control values are provided in the kit)
  7. 25-OH Vitamin D Calibrator set of 6 Calibrators labeled as A to F in liquid form. Ready to use. For calibrator concentration refer vial label.
  8. Wash Buffer Concentrate (20x).

  Materials required but not provided in kit:

  1. Precision pipettes: 10ul, 50-200ul, 100-1000ul.
  2. Disposable pipette tips.
  3. Distilled water.
  4. Disposable Gloves.
  5. ELISA reader.
  6. ELISA washer
- **For biopsy:**
  1) Surgical biopsy set
     a. Surgical blade no. 15
     b. BP blade handle
     c. Tissue forceps
     d. Needle holder
     e. Scissors
     f. Suture thread
  2) Tissue processing unit.
  3) Microscope.

The study design and type is of experimental cross sectional study based on a single examination of a cross section of a population at one point of time. The study was carried out in the Department of Oral Pathology and Microbiology, Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata 700002, West Bengal, India.

2.1 Inclusion and Exclusion criteria:

The inclusion criteria for this study included subjects of age greater than 20 years with suspected or carcinoma or, potentially malignant intraoral lesions. The exclusion criteria was subjects less than 20 years of age.

2.2 Number and Choice of subjects and control:

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The number of subjects taken up for this study was 30 and with patients of age greater than 20 years who presented at OPD with suspected oral cancer or potentially malignant intraoral lesions. On the other hand, 20 subjects were taken up as control who were also of age greater than 20 years and were apparently healthy with no apparent intraoral lesions.

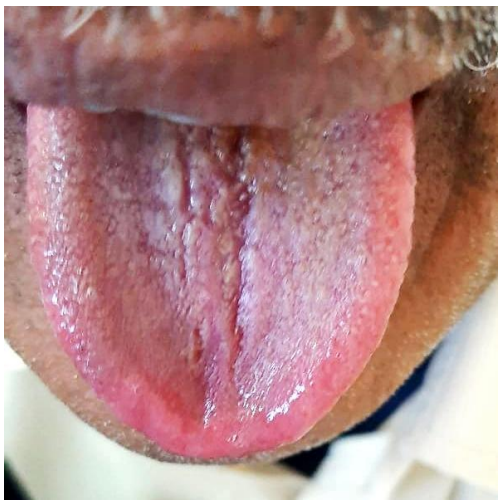

FIGURE 1: Candidiasis on the dorsal surface of tongue

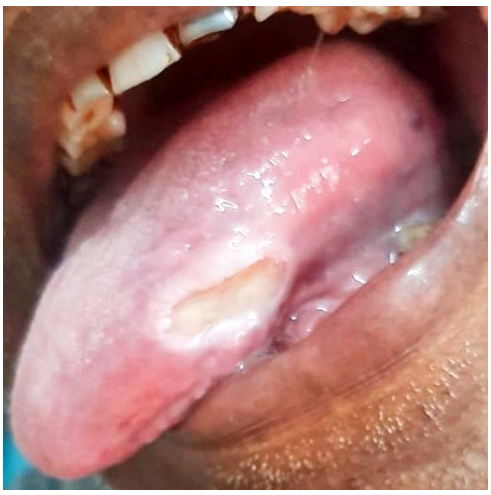

FIGURE 2: Traumatic ulcer on the lateral surface of tongue

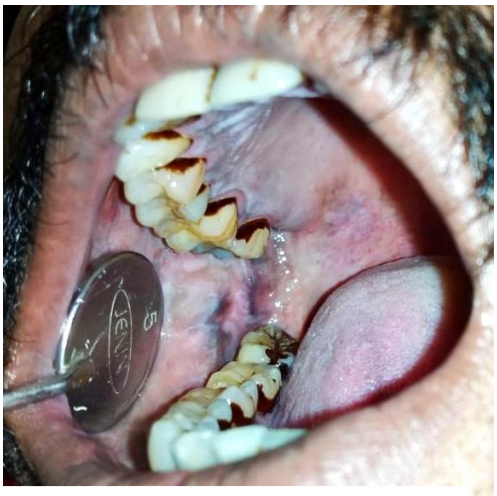

FIGURE 3: Oral Lichen Planus

FIGURE 4: Oral Submucous Fibrosis (OSMF) and Leukoplakia on the right buccal mucosa

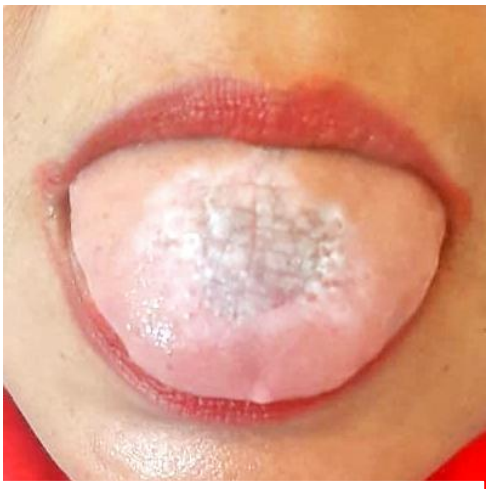

FIGURE 5: Candidiasis on the dorsal surface of tongue

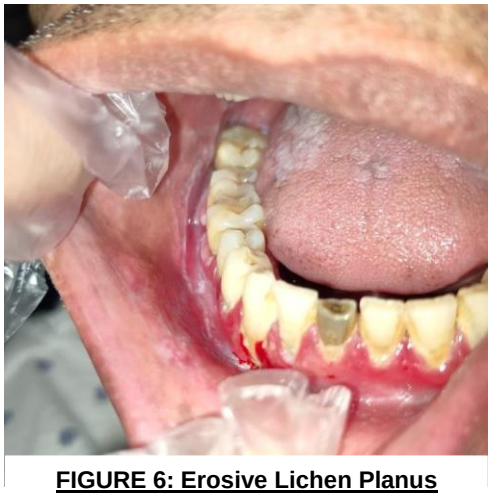

FIGURE 6: Erosive Lichen Planus

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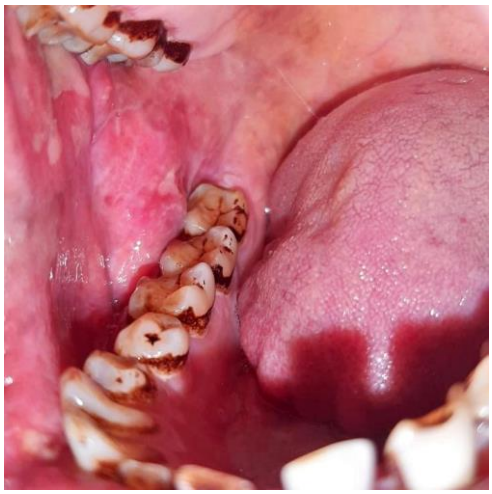

FIGURE 7: Erythro-leukoplakia

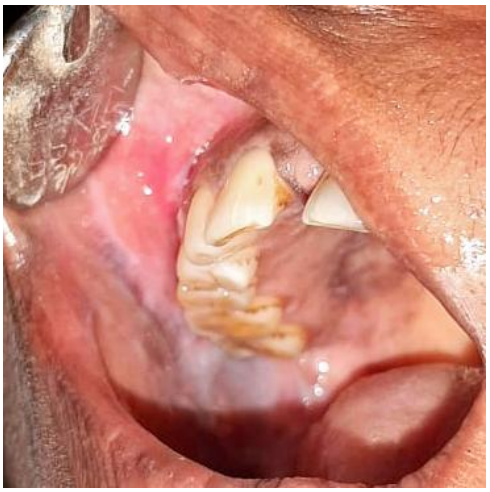

FIGURE 8: Leukoplakia

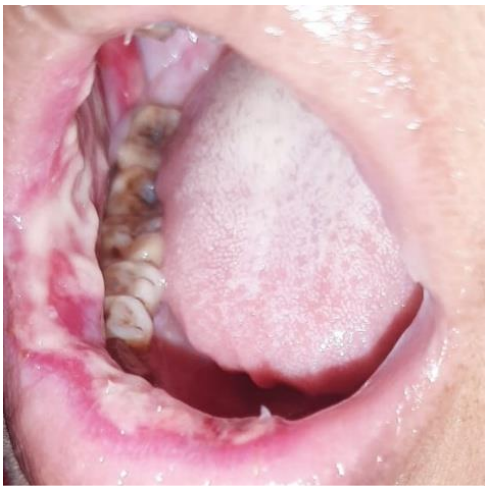

FIGURE 9: Pemphigus vulgaris

2.3 Procedure:

2.3.1 Sample collection from subjects:

Firstly, amongst the patients presented at OPD potential subjects were chosen as per our inclusion criteria. The procedure and objectives of the experiment was grossly explained to them. The informed consent form was signed by the willing participants. Relevant clinical history was taken followed by performing a thorough clinical examination. After this step, all the lesions provisionally diagnosed as either oral carcinoma or potentially malignant intraoral lesions was sent for biopsy. Simultaneously, blood sample was collected from those subjects.

2.3.2 For Biopsy:

An incisional or excisional biopsy sample was taken with the help of surgical biopsy set and the collected sample will be sent for tissue processing. Tissue processing was done as per following steps: fixation, dehydration, clearing, impregnation, embedding and blocking. Section cutting, staining, evaluation of sample under microscope for quantitative estimation of vitamin D3 in serum. Firstly, blood sample will be collected in aseptic method from the subject. The collected sample was undergone with ELISA test.

The principle of ELISA was based upon sandwich ELISA technique. Two monoclonal agglutination sera were used, one in solid and another in liquid state. The sample and calibrator were added into coated microtitre along with two agglutination sera. The walls were washed to remove excess. A third reagent

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was used to detect vitamin D antibody-immunoglobulin complex which was Horseradish Peroxidase (HRPO). Finally with stop reagent the reaction was stopped and result was read with ELISA reader. The concentration of Vitamin D3 in serum is directly proportional to the colour intensity.

2.3.3 Reagent preparation:

All reagents were brought at room temperature and were mixed gently before use. The wash buffer was diluted by 20 times before use.

2.3.4 Sample collection from control:

The blood sample was collected from control in a similar manner after taking their consent and the control blood sample was also estimated in the similar way

2.4 Technique:

10 ul calibrators/controls/samples were added into the respective microwell to which 200 ul of sample diluent was added and the plate was shaken for 30 seconds. The plate sealer was applied and incubated for 20 minutes at 18-25°C. The microwells were washed 5 times with 350 ul of diluted wash buffer. Then, 100 ul enzyme conjugate was added in each well. The plate sealer was again applied and sample is incubated for 10 minutes at 18-25°C. Again, the microwells were washed 5 times with 350 ul of diluted wash buffer and again 100 ul substrate was added again in each well. After this, incubation was done for 10 minutes at 18-25°C in dark room and 100 ul stop solution was added in each well. Results were obtained at 450nm (Rf.600-700nm) within 15 minutes.

2.5 Master Sheet preparation:

A master sheet was prepared using the software Microsoft Excel using the following collected data: serial number, name, age, sex, histopathological report of the oral lesion and serum vitamin D3 levels for the subjects.

2.6 Statistical Analysis:

All statistical analyses were conducted using SPSS 19.0 statistical software. This was done under specificity and sensitivity of oral lesion towards serum vitamin D3. A correlation between oral cancer with serum vitamin D3; correlation between oral potentially malignant lesions and serum vitamin D3 as well as age sex relationship with the lesions with serum vitamin D3 level was evaluated and analysed.

As per this statistical analysis, a final report was prepared.

3. RESULTS:

A calibrated curve was plotted with absorbance value on ‘y’ axis and concentration on ‘x’ axis. And the result was interpreted as per the following reference values:

25-OH Vitamin D Level	Reference range (ng/ml)
Deficient	0-10
Insufficient	10-30
Sufficient	30-100
Toxicity	>100

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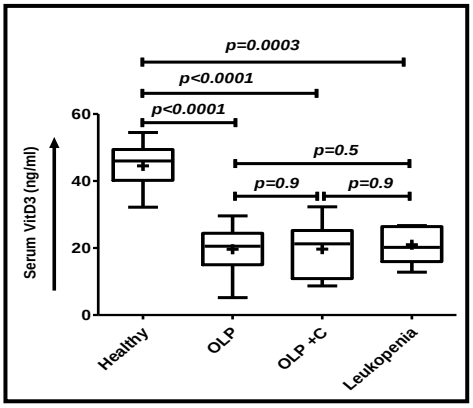

FIGURE 10: Serum concentration of Vitamin D3 in different patient groups

A comparative data regarding the concentration of vitamin D3 showed a significantly lower concentration of vitD3 in all the patient groups (OLP, OLP + C and leukopenia) compared to the healthy control groups (p<0.0001, p<0.0001, p=0.0003 respectively). Intergroup analysis between all the studied patient populations showed no significant variation between them.

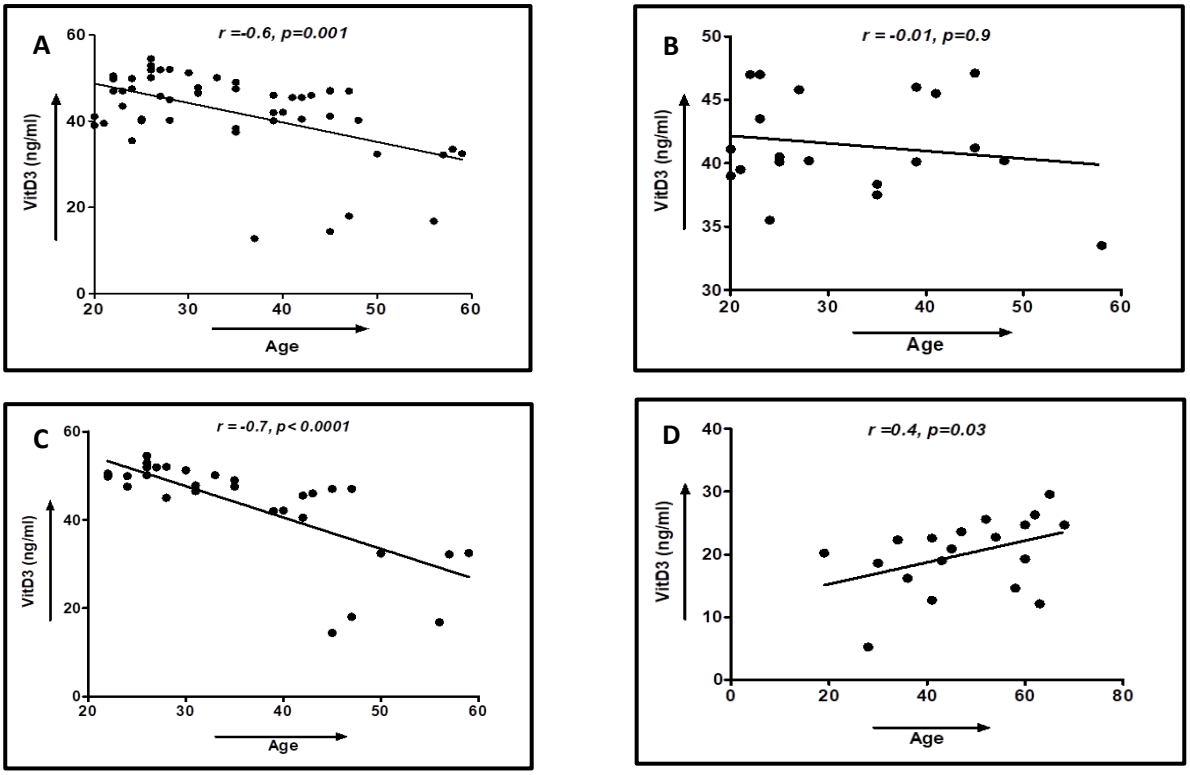

FIGURE 11: Association of age with serum concentration of Vitamin D

A correlation analysis between the age and the serum concentration of vitD3 showed a significant highly negative association (r= -0.6, p=0.001) between them (Fig 2A). Interestingly, data showed no significant correlation (r= -0.01, p=0.9) between age and vitD3 in healthy females (Fig 2B). Whereas, the healthy male population showed a significantly high negative association age (r= -0.7, p<0.0001) of VitD3 with (Fig 2C). Data regarding the association of age and serum concentration of vitD3 OLP patients showed a significant positive correlation (r= -0.4, p=0.03) (Fig 2D). whereas, the other patient groups showed a negative association (not significant) between serum concentration of vitD3 and age.

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4. DISCUSSION:

Oral cancer is a serious health problem with an increasing incidence worldwide. Researchers have studied the potential anti-cancerous action of vitamin D and its association with several cancers including oral cancer.[27,28,29] Many studies have supported the concept of maintaining healthy levels of vitamin D as part of a preventive strategy for oral cancer. One study provided evidence that including vitamin D in treatment regimens might mitigate side effects associated with the chemo- and radiotherapy of oral cancerous lesions and improve the quality of life of such patients.[30,31] A review by *Maturana-Ramirez* also found an association of hypovitaminoses D with lower survival rates in patients with OSCC, a greater incidence of post-operative recurrence, and an increase in adverse reactions to chemotherapy.[32,33,34] Given the low cost and low toxicity of vitamin D, vitamin D supplementation represents an attractive option that merits further exploration.[35,36] On the other hand, our study has provided a full-proof statistical analysis on the inverse correlation-ship between vitamin D levels and prevalence of pre-cancerous lesions of oral cavity and OPMDs which serves as the base of studies done on therapeutic potential of vitamin D supplements on oral cancer.

In one of the study by *Jim T et al,* it had been It has been reported that vitamin D inhibits MAPK signalling pathway activation.[37,38] The MAPK signalling pathway participates in the physiological functions of various cancer cells *in vivo*, including proliferation, apoptosis and differentiation.[39] To detect the effect of vitamin D on the MAPK signalling pathway in OSCC cells, we detected the key proteins ERK1/2, p38 and JNK.[40,41,42] It was found that phosphorylation of ERK1/2 in OSCC cells treated with vitamin D was significantly inhibited, while total ERK1/2 was not changed. Therefore, it was further confirmed that MAPK was an important regulator of vitamin D.[43] Similar to this molecular level analytical study done on MAPK signalling pathway, our study provided the evidence of oral cancer which is regulated by many such molecular pathways has become more common in people having low serum vitamin D levels which is ineffective in inhibiting the OSCC activation pathways and thus increased prevalence of OPMDs.

Lung cancer-associated transcript 1 (LUCAT1) was first reported to be involved in smoking-related lung cancer.[44] It has been reported that LUCAT1 has an antitumour effect by modulating miRNA expression and signalling pathways in clear cell renal cell carcinoma, bladder cancer, colorectal cancer, hepatocellular carcinoma, breast cancer and cervical cancer.[45,46]

Less evidence exists regarding the use of vitamin D as part of a treatment strategy to improve oral cancer outcomes. Based on one study, vitamin D supplementation helped normalize inflammatory modulators associated with oral cancer, suggesting a potential therapeutic effect.[47,48] On the other hand, many studies investigated VDR gene polymorphisms and expression. The results of this research suggest a role in the identification of potential gene therapy targets and vitamin D.[49.50] Similarly, a meta-analysis of tobacco-related cancers, including OSCC, found a correlation between the TaqI polymorphism of VDR and the risk of tobacco-related cancers.[51,52,53] Both tobacco and alcohol increase the risk of oral cancer, and one contributing factor may be that tobacco use alters vitamin D levels. Moreover, excessive alcohol consumption has been associated with VDR CYP27B1 polymorphism, which is correlated with an increased risk for oral cancer.[54,56] In order to become clearer the roles of vitamin D in cancer prevention and immune modulation, a study with the base of immuno-MPE was focused to assess the relation between the plasma vitamin D levels and the incidence of colorectal carcinoma subtypes that classified through immune response conditions.[55] Similar to such claims, we in our study, also found that the subjects who were more addicted to tobacco-smoking and alcohol consumption or addicted to such deleterious habits since many years showed more prevalence of OPMDs and oral cancer. This was so because tobacco smoking and alcohol have potent inhibitory effect on the serum vitamin D levels thus increasing the chances of OSCC.

Study of *Yuan et al.* strongly supports an important role for signaling of vitamin D in the pathophysiology of oral keratinocyte in-vitro and in-vivo, but a deficiency of vitamin D alone seems to be inadequate to stimulate carcinogenesis and change homeostasis of oral epithelia.[57,58] *Afzal et al.* demonstrated a low plasma level of 25-hydroxyvitamin D with increased risk of smoking-related cancer including head and neck squamous cell carcinoma (HNSCC).[59] In this base, vitamin D may reversely alter the carcinogenicity of tobacco smoke chemical. Authors hypothesize that especially smokers may benefit from Vitamin D intake as more than 80% of OSCC are related to tobacco abuse.[60]

Therefore, vitamin D and its metabolites reduce the incidence of various cancers by inhibiting tumour angiogenesis, stimulating mutual adherence of cells, and enhancing intercellular communication, thereby strengthening the inhibition of cellular proliferation.[61,62]

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Vitamin D deficiency has been correlated with some autoimmune diseases such as rheumatoid arthritis, systemic lupus erythematosus, and multiple sclerosis, and it has shown potential therapeutic effects on some autoimmune diseases.[63] Several studies that have evaluated vitamin D serum levels in patients with OLP as well as OSCC have reported controversial results. *Guta et al.* showed that vitamin D deficiency in OLP patients was lower than in healthy subjects.[64] *Afzal et al.* showed that lower vitamin D levels decreased in OSCC patients, whereas *Aremd et al.* found no change.[65] Our study also gave similar results along with a statistical study among 50 subjects thus proving the correlation to be apt.

In another study by *Udeabor et al.* have shown that vitamin D levels were decreased in the late stages of SCC. This could be because of disease severity and complications during this stage.[66] One study has shown that in patients with different head and neck tumours, higher vitamin D serum levels were associated with better survival and progression-free survival.[67] *Bochen et al.* found a significant association between higher vitamin D serum levels with a negative lymph node status and a possible inhibitory effect of Vitamin D on tumour cell metastasis. They also showed that vitamin D status was related to the patients' survival rate. In patients with advanced cancer stages, it has been shown that vitamin supplementation reduced therapy-related toxicities and improved the quality of life of patients.[68,69] Similarly, through our study we also found out that the subjects who had multiple OPMD lesions or, those who had lesions with a greater malignant potential were found to have much less vitamin D3 levels than people with a single lesion or, lesions with a lesser malignant potential. This also correlated vitamin D3 levels and prevalence of OSCC, thus paving a path into research in the therapeutic potential of vitamin D in the prevention of oral cancer.

The results of the present study further corroborate the assertion that vitamin D deficiency may be a potential risk factor in the development and progression of OPMDs and OSCC. As with patients who have other immunologic disorders, vitamin D deficiency should be considered in patients with OPMDs and OSCC, regardless of the site and type of OLP, candidiasis, OSMF, traumatic ulcer and OSCC.

5. CONCLUSION:

Thus, to summarize, this study expresses a unique correlation between serum vitamin D levels and prevalence of OPMDs. In one of the studies by *Anand et al.* have reported that OSCC patients who received vitamin D3 supplementation (1,000 IU VD3/kg) showed reduced therapy-related debilitating effects and had improved quality of life compared to patients who did not receive vitamin D3.[70,71] However, extrapolation of our observations to the clinical setting should be done with caution. As such, there is considerable scepticism on the utility of vitamin D3 supplementation in cancer due to failed clinical trials of vitamin D compounds. Recent results from a large (25,000 participants) randomized, placebo-controlled trial of vitamin D3 supplementation (2000 IU per day) and omega-3 fatty acids did not show any reduction in the incidence of breast, prostate or colorectal cancers.[72] It should be noted that the VITAL study did not evaluate the incidence of oral cancers. Similarly, published negative trials of vitamin D or related compounds have been conducted in unselected patient cohorts.[71] Dietary supplementation of vitamin D3 is safe and cost-effective and is therefore attractive for implementation in the clinical setting.[72]

It may, therefore, be necessary to routinely assess vitamin D status of patients attending the medical and dental outpatient clinics and to prescribe vitamin D supplements to subjects with moderate to severe deficiencies in order to decrease the chances of OPMDs and OSCC development. On the other hand, improvement of VitD status with sensible sun exposure, VitD supplementation and ingesting foods containing VitD is a reasonable strategy to reduce the risk of malignancy.

COMPETING INTERESTS:

Conflicts of Interest – none declared.

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PATIENT'S CONSENT FORM:

KUSUM DEVI SUNDERLAL DUGAR JAIN DENTAL COLLEGE & HOSPITAL

(A UNIT OF SHREE S.S. JAIN SABHA)

DEPARTMENT OF ORAL AND MAXILLOFACIAL PATHOLOGY AND MICROBIOLGY

INFORMED CONSENT FOR

STUDY ON POSSIBLE CORELATION BETWEEN VITAMIN D3 AND ORAL PREMALIGNANT LESIONS

Patient Name: OPD No.----------

Age: ---------- Years Sex---------- Date: ----------

Contact No.

Address:

I declare that,

1. I have been informed of and understand the procedure of sample collection (Blood) for diagnostic purpose.
2. The procedural risk, complication, allergies have been explained to me in the language I understand.
3. I give consent for preservation of specimen in department archives.
4. I also give consent to relevant studies on the obtained specimen(s).

---------- ----------

Signature of the Researcher Signature of the Patient

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ETHICAL APPROVAL:

KUSUM DEVI SUNDERLAL DUGAR JAIN DENTAL COLLEGE & HOSPITAL

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KSD Jain Ethics Committee
Institutional Ethical Committee
EC/NEW/INST/2023/3477
01.09.2023

The Guide,
KSD Jain Dental College & Hospital
Kolkata.

[Sub: Institutional Ethical Committee Approval Certificate for the proposals reviewed on 29.08.2023]

Respected Sir,

As per the proposals (synopsis) reviewed by "KSD Jain Ethics Committee – IEC" , on 29th August 2023, the following studies have been granted approval to proceed for further research. The study will be commenced at the institutional premises as per the respective departments.

Thanks & Regards,

Approved.
29/8/23

Dr. Rupnarayan Bhattacharya
Chairperson

Dr.Nikita Parasrampuria
Member Secretary

N.B.- The acceptance list has been attached herewith for perusal of the investigators.

1/1

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APPENDIX:

The master sheet prepared for the 50 subjects is as follows:

S NO.	NAME	AGE	SEX	P/D	Vit D3 Level (mg/ml)
1	Rulefa Bibi	28	F	OLP	5.2
2	Bimal Mukherjee	62	M	Leukoplakia	19.1
3	Alo Saha	54	F	OLP	22.74
4	Milan Kr Ghorai	31	M	Leukoplakia	26.1
5	Anuradha Mitra	63	F	OLP	12.1
6	Gouri Bose	57	F	Preleukoplakia	20.2
7	Asit Kr Bose	58	M	OLP	14.6
8	Papia Das	36	F	OLP+ Candidiasis	11.6
9	Rita Ganguly	65	F	OLP	29.6
10	Mukti Saha	68	F	OLP	24.7
11	Pratap Mukherjee	52	F	Leukoplakia	26.7
12	Sikha Rani Biswas	60	F	OLP	24.7
13	Tanusree Manna	47	F	Oral Ulcer	0.7
14	Moushumi Pramnanik	45	F	OLP	20.9
15	Raghabendra Nath Dutta	62	M	OLP	26.3
16	Mou Dutta	36	F	OLP	16.2
17	Mitra Mondal	21	F	Recurrent Apthous Ulcer	20.4
18	Smriti Ganguly	43	F	OLP	19
19	Deepshikha Das	50	F	Candidiasis	22.3
20	Ram Asish Sharma	54	M	Verrucous Hyperplasia	13.7
21	Micheal Murmu	22	M	OLP+ Candidiasis	32.3
22	Soma Das	47	F	OLP	12.1
23	Kumkum Dutta	65	F	OLP+ Candidiasis	8.7
24	Tapan Ghosh	68	M	OLP+ Candidiasis	21.6
25	Shyamal Mondal	29	F	Recurrent Apthous Ulcer	35.3
26	M. Devi	68	F	Erosive LP	14.3
27	Kalpana Manna	60	F	OLP+ Candidiasis	20.9
28	Raina Nandi	25	F	Glossitis d/t anaemia	15.6
29	V.N Yad	34	M	OSMF	18.76
30	Gayatri Devi	47	F	OLP	23.6
31	Subrata Bhattacharya	59	M	Traumatic Ulcer	19.54
32	Mamata Guha	48	F	OLP+ Candidiasis	22.9
33	Sunita Pramanik	60	F	Erosive LP	28.5
34	Vijay Bhattacharya	54	M	Traumatic Ulcer	27.1
35	Arpana Bera	43	F	Glossitis	19.39
36	Sabitri Dutta	60	F	OLP	19.27
37	Subrata Saha	41	M	Leukoplakia	12.8
38	Bivash Kanti Majumdar	68	M	Traumatic Ulcer	19.4
39	Sikha Dutta	48	F	Glossitis	18
40	Dibekar Mondal	70	M	Candidiasis	27.8
41	Madhumita Mandal	30	F	OLP	18.6
42	Kabita Ghosh	41	F	OLP	12.67
43	Ankana Choudhury	41	F	OLP	22.6
44	Santanu Dutta	53	M	OSMF+Erythoplakia	23.7
45	Bandana Raut	52	F	OLP	25.6
46	Subhashini Mistry	34	F	OLP	22.3
47	Niyoti Mondal	61	F	Pemphigus	19.4
48	Prahlad Rajak	19	M	OLP	20.2
49	Purna Chandra Barui	49	M	Erosive LP	23.7
50	Mousruti De	35	F	OLP	38.34

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