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PREVALENCE OF GINGIVAL DISEASES AMONG ANEMIC PATIENTS ATTENDING A DENTAL COLLEGE

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Abstract

Anaemia is a common and serious health disorder among females and all age groups, with anemia of chronic disease being the second most prevalent. It is an inflammatory disease of supporting tissues of the tooth caused by specific microorganisms. Response to bacteria and their products induce major vascular response , of fiery explanatory mechanism for the interactions between periodontal infections and a variety of systemic disease. Therefore, periodontal results in low grade systemic inflammation , which may cause lower number of erythrocytes and consequently lower hb concentration.The aim of this study was to assess the prevalence of periodontal status of the anemia patient in Chennai-based population.The study was conducted in Saveetha Dental College chennai. 50 female outpatients were randomly selected for the study . Parameters like bleeding on probing , hemoglobin levels, age were assessed . The data collected were then put in spss software for statistical analysis. Moderate anemia patients had a high frequency of generalised gingivitis and mild anemia patients had generalised gingivitis . Within the limitations of the study, it can be safely deduced that a positive relationship exists between the hematological parameters and severity of chronic periodontal disease, suggesting that long-standing chronic periodontitis may lead to the development of signs of anemia.

KEY WORDS: *Anemia , Bleeding on probing, Females, Periodontal status, Prevalence*

I. Introduction

Anemia is a major public health problem worldwide and often ignored in both developed and developing countries [1] . Pre school children , pregnant women , adolescents constitute vulnerable groups of anemia . During childhood nutritional needs of boys differ from girls. Iron requirements peak during adolescence due to rapid growth and increase in blood volume [2] . In developing countries parasitic infections are more which is the peak requirement of iron in the human body.

Periodontitis is an inflammatory disease of the supporting tissue of the tooth caused by microorganisms including both viral and bacterial load on a susceptible host . As periodontal tissue mounts an inflammatory response to bacterial challenges both proinflammatory mediators ,TNF alpha [3],and interleukin 1, along with other cytokines like IL21 exhibit dual effects , anti and proinflammatory roles in periodontal breakdown [4].

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The systemic challenges will also induce major vascular responses like endothelin 1 which plays an important role in periodontal pathogenesis. cite khaleel both article [5,6].The chronic inflammatory state of periodontal destruction is caused by multiple etiology and risk factors. The role of Gram-negative anaerobes in periodontal destruction is well established. Recently, the viruses have been identified to play a major in the etiopathogenesis of chronic periodontitis [7] Chronic periodontitis, which progresses relatively slowly and are more common in adults.The sulcular epithelium acts as a barrier and prevents the entry of the microorganisms and other irritants into the systemic conditions [8] . The host microbial interaction in periodontitis leads to ulceration of sulcular epithelium and acts as a portal of entry for microorganisms to other connective tissues and causes bacteremia[9]. The host response offers explanatory mechanisms for the interaction between periodontitis and a variety of systemic disease . Infection, malignant cells and autoimmune dysregulation lead to activation of the immune system and production of proinflammatory cytokines, TNF-Alpha pro-inflammatory mediator that causes destruction of periodontal tissues. [3] and IL-1 to IL-6 [4] depress the erythropoietin production leading to development of anemia.[10].Proteolytic processes are known to be responsible for osteoclastic bone resorption. Degradation of bone matrix proteins is initiated by acidic lysosomal proteases secreted from osteoclasts, Among the various lysosomal proteinases, recent data, however, strongly implicate cathepsin K (CSTK) as the predominant effector in osteoclastic bone resorption.Drug induced gingival enlargements can be encountered in patients under long term medications and studies have reported high levels of endothelin in these conditions.[6] [5]

Chronic obstructive pulmonary disease(COPD) and periodontitis are debilitating effects of inflammatory origin, (COPD) manifests as inflammation of the lung and periodontitis results in destruction of connective tissue . periodontitis not only will rule out anemia but also certain systemic conditions associated with it [11]. One of the most important esthetic conditions encountered in periodontitis is gingival recession [12] which costs tooth loss for which the treatment would be flap surgeries [13] and dental implants respectively which can be placed during the help of cbct[14] evaluation after periodontal therapy [(15)] . Periodontium once damage leads to decrease in regenerative property leading to intrabony defects which is compromising[16] [17]. Current therapy focuses in stem cell treatment for periodontal disease [18]

Periodontitis is a risk factor for various systemic diseases and affects half of the school children and pregnant women in developing countries and apparently four times more than developed countries. As mentioned, COPD and periodontitis are interconnected since they are of inflammatory origin . Malnutrition plays an important role females due to their lack of proper food habits . Periodontal therapy includes both surgical and nonsurgical management of the disease process. Various antimicrobials and chemotherapeutic agents, such as, triclosan, have been tried and tested in the management of periodontal diseases [19]. In a study by [20] Hiora and Chlorhexidine mouthwashes were equally effective in the treatment of gingivitis . So the aim of this study was to assess the prevalence of periodontal status of the anemia patient in the Chennai-based population.

II. MATERIALS AND METHOD :

The present study was a hospital based retrospective study for which the 86000 case sheets were analysed from June 2019 to June 2020. The study was carried out in the unit of periodontics . The study period was for one year . Detailed verbal instructions were given to each participant before the start of the study .

The study population consisted of age group 20- 60 from the outpatient department of Saveetha Dental College, Chennai. Analysing 300 case sheets of female patients , 50 patients with anemia and their gingival status was obtained .A written informed consent was obtained from the patients before the start of study . Ethical consent obtained from the scientific review board of Saveetha University {SIHEC/2020/DIASDATA/0619-0320} . A detailed family history was taken. Bleeding on probing ,Gingival status based on ,the anemia was categorized into mid , moderate and severe based on haemoglobin levels and the data was collected. The data was collected and segregated according to their age and put in excel sheets and then transferred to SPSS software for graphical and statistical analysis version

III. RESULTS:

Graph 1 represents distribution of the study population based on age,females of age group 20-25 were 14.3% , 25-40 were 36.7%, 40-50 were 34.7% ,25-40 were 36.7%, 60-70 were 6.1% . Graph 2 represents distribution study population based on gingival health, (53.06%)had gingivitis , (10.20%) had periodontitis ,(14.29%) had localised gingivitis , (12.24%) had localised periodontitis and (10.20% had healthy gingiva . Graph 3 shows the anemic status of subjects based on mild,moderate, severe and are compared with the gingival status . The severe anemia had (6.0%)generalised gingivitis , (4.0%) chronic periodontitis and (2.0%) in both localised gingivitis and localised periodontitis. Moderate anemia had (22.0%) generalised gingivitis (4.0%) chronic periodontitis and localised gingivitis , (2.0%) localised periodontitis and healthy gingiva. Mild anemia (24.0%) generalised gingivitis , (4.0%) periodontitis (8.0%) localised gingivitis , localised periodontitis and healthy gingiva .

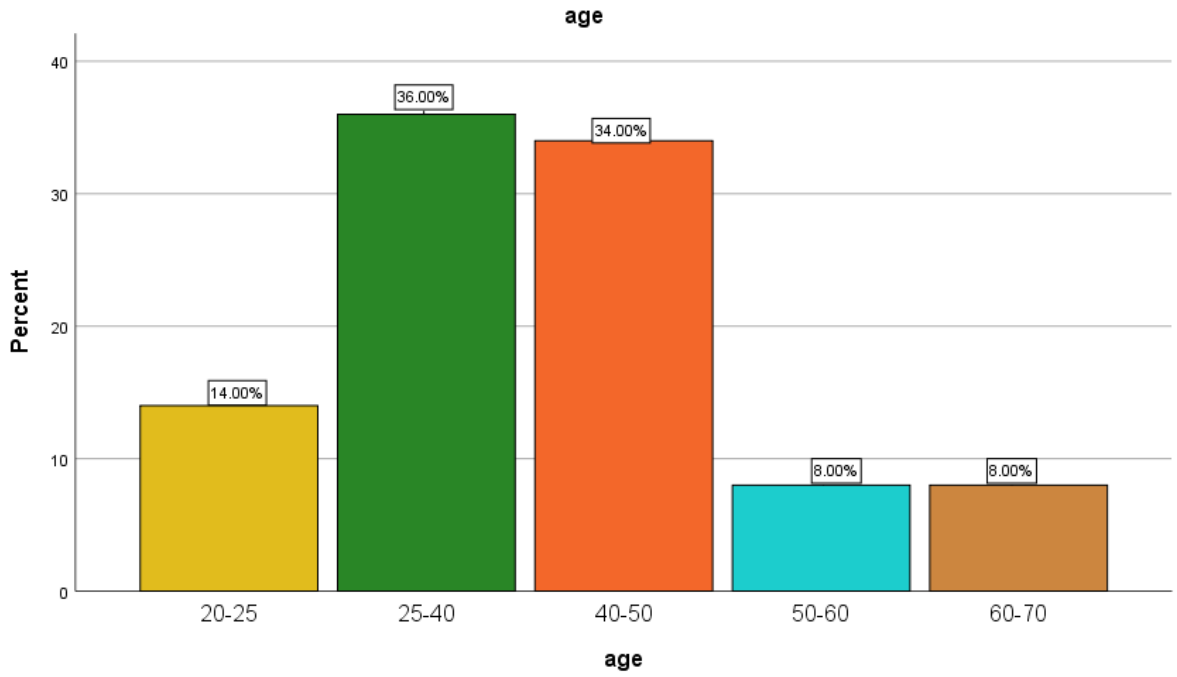

Figure 1: Represents distribution of study population based on age. X axis represents the age , y axis represents the age in percentage . The age group of 20-25 years (yellow) , age group of 25-40 years(green) , age group of 40-50 years(orange) , age group of 50-60(blue) age group of 60-70 (brown). From this we can infer that the most prevalent age group for anemia was 25-40 years (36.0%).

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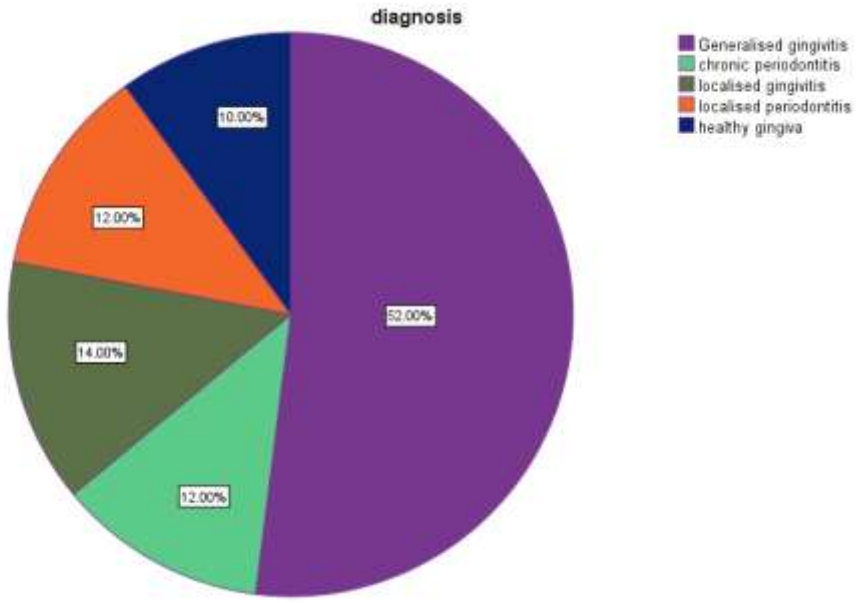

Figure 2 : denotes the distribution of study population based on periodontal status of individuals. (purple colour)generalised gingivitis, (green colour)chronic periodontitis, (dark green) localised gingivitis,(orange colour) localised periodontitis and (dark blue) healthy gingiva. From this pie chart we can infer that anemic patients had high prevalence of gingivitis (52.0%)

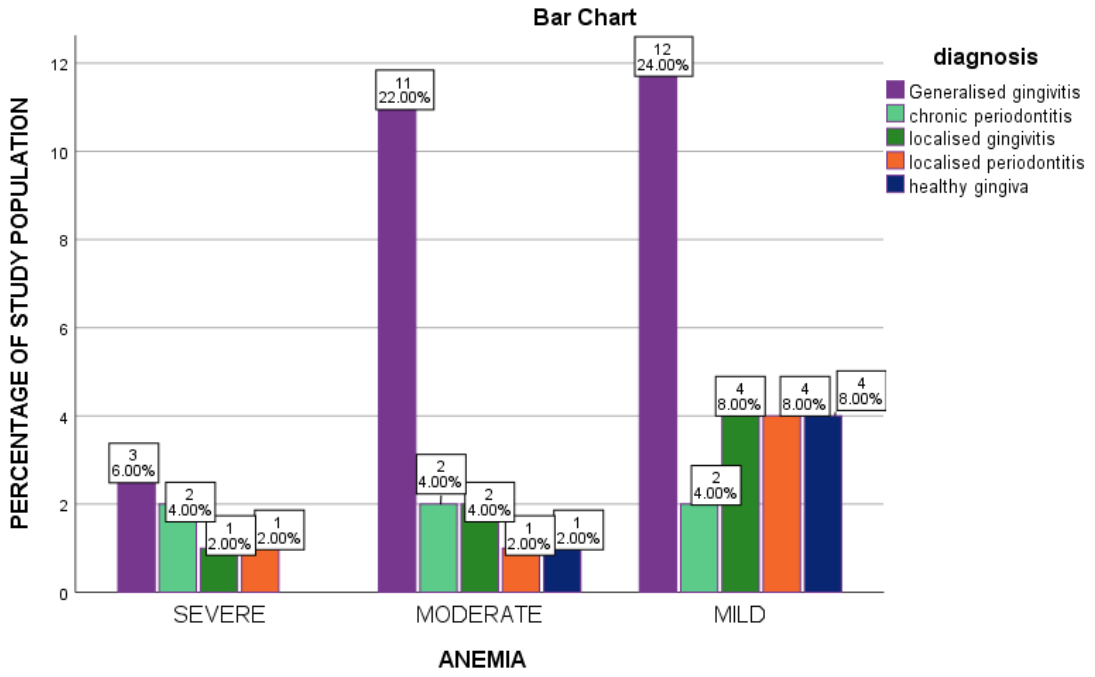

Figure 3: represents the distribution of study population based on anemia and gingival status. X axis - (anemic status of the population) , y axis -(the percentage of gingival status) Association of anemic and the gingival status(chi square value = 5.464; df 8, P value 0.707. Chi square test) was not statistically significant . From this we can infer the majority of generalised gingivitis had mild anemia .

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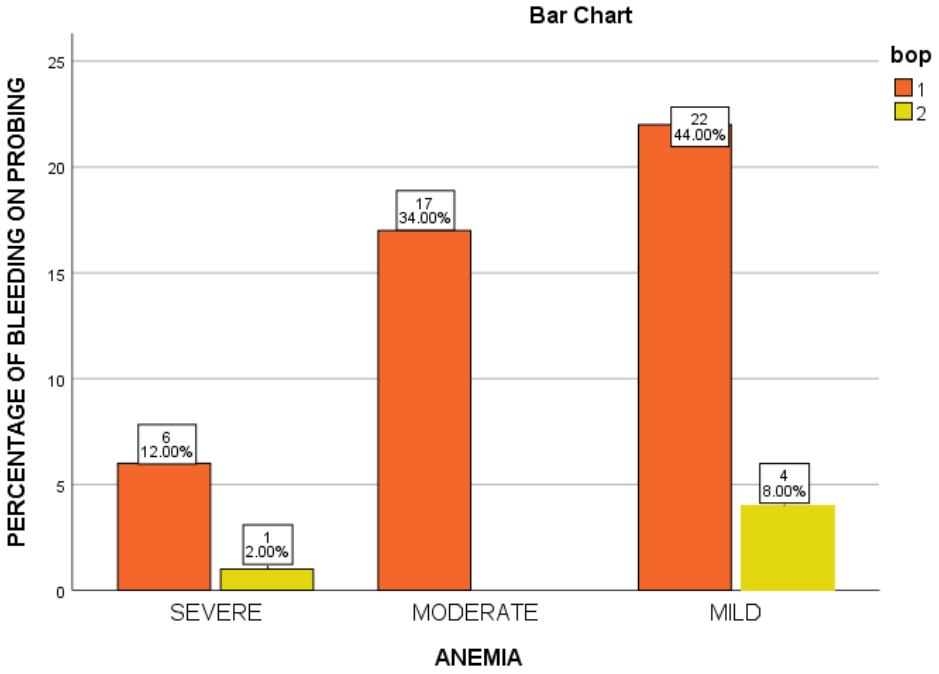

Figure4: represents the distribution of study population based on anemia and bleeding on probing . X axis (anemic status) and Y axis (percentage of subjects with bleeding on probing) Association of anemia and bleeding on probing (chi square value 2.869,df 2 , P value 0.238) was not statistically significant. From graph 4 it can be inferred that mild anemia had the higher bleeding scores (44%).

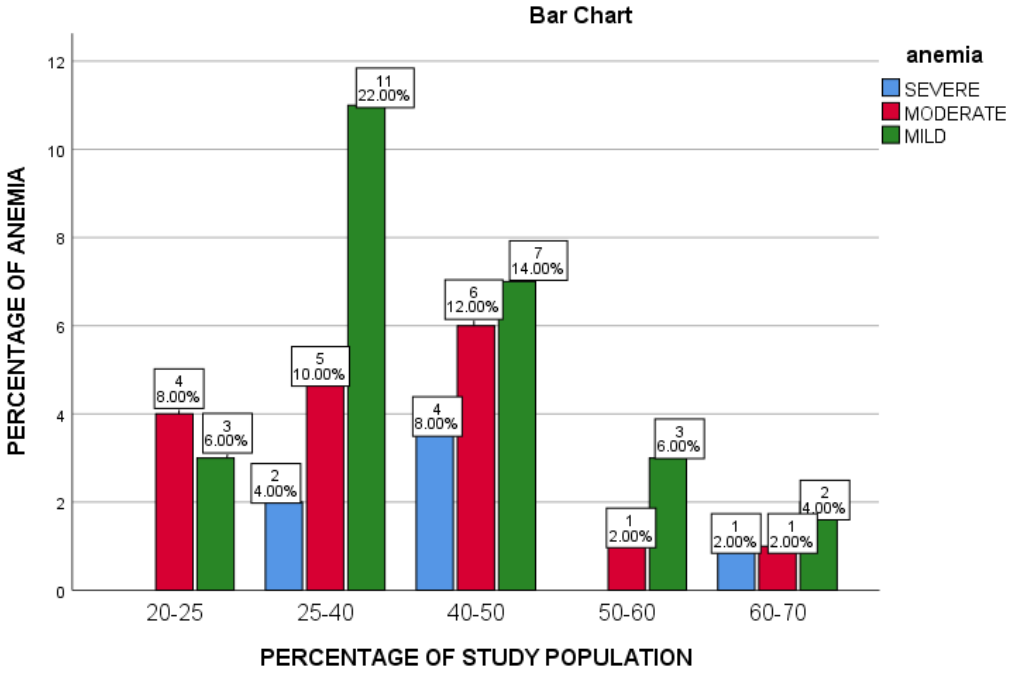

Figure 5: represents the distribution age wise distribution of haemoglobin level X axis (age wise distribution) and y axis (anemia level) . Association of age and anemic status was not statistically significant. (chi square value =5.795;df=8, p value 0.670 chi square test) From graph 5 we infer that mild anemia the most predominant age group was 25-40 years.

Graph 4 represents (8.89%) of the patients who had severe anemia , (34.0 %) of the patients who had moderate anemia , 44.0% of the patients who had mild anemia had bleeding on probing value 1 . 2.0% of the patients who had severe anemia and 8.0% of the study population who had mild anemia had probing levels of 2. Graph 5 represents the distribution of study population based on age and anemic status . The age group of 20-25 years had 8.0% moderate anemia and 6.0% had mild anemia .The females belonging to the age group of 25-40 years had 4.0% severe anemia , 10.0% had moderate anemia and 22.0% had mild anemia . The females belonging to the age group of 40-50 years had 8.0% had severe anemia , 12.0% had moderate anemia and 14.0% had mild anemia.The females of the age group of 50-60 years had 2.0% moderate anemia and 6.0% mild anemia . The females of the age group of 60-70 years had 2.0% severe and moderate anemia and 4.0% mild anemia .

IV. DISCUSSION:

Anemia happens when the number of healthy red blood cells in your body is too low. A low red blood cell count indicates that the amount of oxygen in your blood is lower than it should be.The subject of association of anemia with chronic periodontitis has been discussed in literature many times as early as the 20th century. Hutter et al.studies prove that lower levels of erythrocytes, lowered hemoglobin and increased 11 ESR was found in Caucasian subjects with periodontitis [21]. The severe type of Periodontitis results in low-grade systemic inflammation, which may cause lower number of erythrocytes and, consequently, lower hemoglobin (Hb) concentration and ACD .Anemia of chronic disease [ACD] is a chronic infection and inflammatory condition. The major pathophysiology of ACD is due to the inability of macrophages to release iron which normally comes from the breakdown of senescent RBCs, so serum iron falls while the iron stores are normal or increased. [22]

In a study by meghna dhanajeyan patel , the study sample involved males, females and smokers . The total age group involved was 20-50 years with 16.0% of 20-30 age group, 23.0% of 30-40 age group and 11.0% of 40-50 age group. In our study we have exclusively involved the datas of females as they are more prone for anemia due to several conditions. The age groups included were from 20-70 years. 14.0% of age group 20-25 years , 36.0% of age group 25-40 years , 34.0% of 40-50 years , 8.0% of age group of 50-60 and 6.0% of the age group of 60-70.[

In this study 52.0% had generalised gingivitis , 12.3% had chronic periodontitis ,14.0% had localised gingivitis , 12.0% had localised periodontitis and 10.0% of the patients had healthy gingiva . In a study by Mulpuri ,14.04% had gingivitis , 54.04% had periodontitis, 2.98% had localised periodontitis and 2.55% had localised gingivitis and 26.38% of the patients had clinically healthy gingiva [24] Our study shows more inclination towards generalised gingivitis in mild anemic patients . In this study, correlation of bleeding on probing and anemic status was 3.853 with a in significant P = 0.146. In a study by Susan et all it was 0.343 with significant value associated with the hemoglobin level with P = to 0.049 [25]. In our study bleeding on probing was 62% of the examined sites, studies by Hind aljohani et al, bleeding on probing was 57% on examined sites [26]

In our study 14.% patients had severe anemia and in a study by Pradeep shows 33.6% of patients had haemoglobin concentrations below the normal limit which shows that females were less anemic when compared to other study samples [27]. In our study 14.0% of the females were anemic in the case group ,and in a study by sarita parihar , Nk sharma et .al, the percentage of patients who were anemic in terms of Hb was 22.5% in the case group [28]

In a study by luigi nibali et al ,the patients who had 14% to 15.7% of periodontitis and 8.4% to 10.2% healthy gingiva were anaemic. In our study 6.0% generalised gingivitis , 2.0% of localised gingivitis and localised periodontitis had severe anemia (5-7g/dl) .[29].

Limitation:

The limitation of study was that it had a small sample size and only females were selected.. Larger sample size with more parameters like clinical attachment loss, probing depth and cause for anemia would have given more support to this study to rule out periodontal condition. The present study involves only the female population because anemia is prevalent in females when compared to males . Longitudinal study with larger sample size and men with smoking habits with anaemia and periodontitis would help in wider knowledge gaining

Future scope :

The future scope will aim at prospectively studying anemia before and after nonsurgical periodontal therapy . To have a regular follow up to check the improvement in anemic status following periodontal therapy.

V. CONCLUSION:

Among the different age groups under study, anemia was more common amongst 25-40 years of age. In terms of periodontal status, gingivitis was the most common finding in these patients (53.06%). Patients with a high percentage of generalised gingivitis (24.0%) had mild anemia.The subjects had a higher prevalence of mild anemic status , however this was statistically not significant. Bleeding on probing was predominant in mild anemia followed by moderate anemia . No association was observed in anemia and bleeding on probing .Further research with larger sample size , taking into consideration different causes of anemia , would throw a better clarity in the future.

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AUTHORS CONTRIBUTION

Reshmi has contributed to the data collection, study design , analysis , results, tables and manuscript preparation .

Dr. Sankari has contributed to the design of the study , analysis of the data, results and manuscript preparation and proofreading of the manuscript.

Dr. Arvind has contributed to reviewing the article.

CONFLICTS OF INTEREST:

The research projects are self funded and are not sponsored or aided by third parties . there is no conflict of interests

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