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JOURNAL OF INDIAN DENTAL ASSOCIATION, THIRUVALLA

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Dr. Sandra Arun

IDA THIRUVALLA

Officially formed as a new branch on 7th December 2008, IDA Thiruvalla boasts an exponential all-round growth under the able steersmanship of visionary leaders since its inception. In its 16 years of existence we take pride in the fact that our branch has won several accolades, winning a multitude of awards not only at the State level but also at the National level too.

The unity and harmony among the eclectic mix of brilliant and experienced members is unparalleled and this is evident in the overall performance of the branch.

IDA Thiruvalla is proud to have produced many state leaders who have achieved immense recognition at the State office level.

As a branch we have been successful in having a steady membership growth, with annual members from as far as Trivandrum, Adoor, Enath, Pathanamthitta and from all corners of the world, who actively participate in the online and offline programs whenever feasible.

IDA Thiruvalla office has always acted considerately in times of need for its members, be it during COVID times by providing PPE kits during scarcity, or more recently helping with the CE registration. Also, as part of obligation towards the society we have been providing financial aid towards medical assistance, scholarships, food kits, school stationary, etc; donated a house, a free dental clinic at a destitute home, a breasfeeding kiosk at the local railway station; and even conducted many Awareness Classes and Oral cancer screening and Check-up camps among different target audience-school children, migrant workers, Kudumbasree members, differently-abled kids, senior citizen forums, tribals, etc.

We were successful in conducting tribal projects at Attathode more than once and bagged National awards each time.
With its commitment towards our members and towards dentistry in general, our branch has done a tremendous job to help update and impart information regarding newer developments and technologies and thereby aiding to stay abreast with the current trends in dentistry through our innovative CDEs by eminent faculties, Handson trainings from renowned practitioners, webinars, and also through our journals.
Hope our readers find the latest edition of TAPER educative and enlightening.

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EDITOR'S MESSAGE

Dear colleagues,

I am immensely happy to release our journal 'TAPER' volume 8 issue 1.I thank all the office bearers and members of Indian dental association, Thiruvalla branch for their constant support and encouragement in enabling to carry out the responsibilities as journal editor. Indian dental association (IDA) is an authoritative, independent and recognized voice of dental professionals in India. Strength of IDA is from its member's contribution in its activities. Our association is committed to public health, ethics, science and advancement of dental professionals through initiative in advocacy, education, research and development of standards.

To fulfill this academic mission, our journal 'TAPER' will provide platform to all members to share their knowledge in form of scientific articles. At last I would request all the members again to share their knowledge and keep on supporting this noble venture. I extent my heartfelt gratitude to all members who contributed articles to our journal.

I conclude my editorial with a few lines by Mark Twain

"Dance like there's no body watching,
Love like you will never be hurt,
Sing like there's no body listening,
And live like its heaven on earth"

Jai IDA

Dr. Prameetha George Ittycheria
Editor in charge
IDA Thiruvalla

MESSAGE

Dear Dr. Prameetha,

Extremely glad to learn that you are publishing the volume 8 issue 1 of your journal "TAPER."
Hearty congratulations to your President Dr. Sunil Roy Koshy and your Secretary Dr. Seema Joseph for being instrumental in the timely release of this journal. Journals such as these are thelifeline of every great movement. My best wishes to you and IDA Tiruvalla for this IDA year and I am sure your activities will be an inspiration to many.
Thank you and all the very best.

Dr. Terry Thomas Edathotty
President,
IDA Kerala State Branch

MESSAGE

It gives me immense pleasure to introduce the upcoming Volume 8, Issue 1 of TAPER, the esteemed journal of IDA Thiruvalla branch. Under the exemplary leadership of President Dr.Sunil Roy Koshy, Secretary Dr. Seema Joseph, and Editor Dr. Prameetha George Ittycheria, this edition promises to uphold the highest standards that are associated with the activities of IDA Thiruvalla over the years. TAPER continues to be a beacon of knowledge and hard work in our field, and I commend the dedication of all involved. As we embark on this new volume, I encourage our members and readers alike to engage with the insightful articles and contribute to the advancement of dentistry.

Thank you

Dr. Deebu J. Mathew,
Honorary Secretary,
IDA Kerala State Branch

MESSAGE

HEARTY WELCOME AND WARM GREETINGS,

With the blessings of almighty, I have taken over as president of Indian dental association, Thiruvalla branch. I remember my teachers and mentors for guiding me throughout my professional life. I deem it as an honour to work with past state president Dr Samuel, past presidents-secretaries- treasurers and executive committee members. They are great administrators and well-wishers. Seniors, your experience,timely intervention and advice are unbelievably precious. My thanks to ever supporting family.

I earnestly aspire and strive to achieve excellence in academics, community service, women's activities, cultural and sports with the support of dedicated and committed office bearers,executive committee members and vibrant-enthusiastic-chirpy youngsters. Youngsters impart so much of vigour, vitality and energy into each programme.

In 2024, our branch is taking dentistry to door step through meticulously planned and executed activities. Our branch with coordinated efforts is providing oral health that is equitable with community participation and this includes government district hospital, Pushpagiri college of dental science and Pushpagiri medical college. We are collaborating with governmental and non-governmental organizations. We hope to achieve the objectives that we have set forth in 2024, for which we need constant support and encouragement of all our esteemed members.

Our journal editor Dr Prameetha George Ittycheria has incorporated features peer reviewed, scientific articles relevant to oral health issues, as well as informative articles aimed at clinicians. Congrats Dr Prameetha - editor in chief for stunning work. Wishing very best to each one of you. Proud to lead a bunch that excels in every sphere of life.

DR SUNIL ROY KOSHY
President
IDA Thiruvalla

MESSAGE

Warmest Greetings from IDA Thiruvalla branch.

"Knowledge is power. Knowledge shared is power multiplied"-*Robert Noyce.*

It has been a fruitful IDA year for our branch and even though the year started with uncertainties with regard to the CE bill registration, our team handled the situation well. Our unique CDEs, massive reach into the masses by our CDH wing and the plethora of programs by our WDC has helped the branch retain the camaraderie among members and ensured optimum public outreach.

IDA Thiruvalla has always been in the forefront to help its members update and upgrade with the latest developments through its CDEs and its very informative journals.

Over the years our journal, TAPER, has carved a niche for itself with its high-caliber content. The year 2023 was a remarkable one for our branch, especially since our branch coveted most of the state awards and National awards, including an award for the Best Journal. Adhering with the standards, we are thrilled with the release of the first edition of TAPER this year.

We recognize the tremendous effort by our Editor, Dr. Prameetha George Ittycheria for making this Journal materialize.

Let us encourage and foster knowledge-sharing.

DR SEEMA JOSEPH
Honorary Secretary
IDA Thiruvalla

CLINICAL PRACTICE GUIDELINES FOR THE MANAGEMENT OF THE PERIODONTITIS PATIENT WITH DIABETES

Professor. Dr. Annie Kitty George MDS. Department of Periodontology, Pushpagiri College of Dental Sciences

Abstract: Periodontitis and diabetes mellitus are two most prevalent chronic inflammatory conditions that plague mankind. The bi-directional relationship of the two diseases has been well recognized. The diabetic patient with periodontitis needs specific treatment approaches targeted at controlling both diseases. It is recommended that patients with advanced periodontal destruction and no prior personal history of diabetes should be screened for diabetes mellitus. This review article is a summary of clinical considerations and practice guidelines for patents with periodontitis and diabetes mellitus.

Key words: Periodontitis, Diabetes mellitus, Co-morbidity

INTRODUCTION:

Periodontitis reflects an immunoinflammatory response of the host to microbes present in the plaque biofilm. Diabetes mellitus is underlined by impaired carbohydrate and lipid metabolism. Periodontitis and diabetes mellitus are now considered as "comorbid old friends" who live across a two-way street.[1,2] Ample evidence has always supported the bi-directional relationship between these two chronic diseases.

India ranks second in the world regarding prevalence of diabetes and Kerala is one of the most affected states. Diabetes mellitus has been considered as a grade modifier in the grading and staging of periodontitis. [3] Periodontal diseases are considered the most important global oral health burden and the prevalence of severe periodontitis is 11.2%. [4]

Dental professionals frequently encounter patients with both periodontitis and diabetes. This article briefly describes current diagnostic criteria for diabetes and practice guidelines for the diabetic patient with periodontitis. The clinical practice guidelines presented in this article were laid down by Indian Society of Periodontology (ISP) and the Research Society for the Study of Diabetes in India. (RSSDI) [5]

Diagnosis of diabetes: can be made with any one of the following criteria.[6]

Fasting plasma glucose (FPG)	≥126 mg/dL/≥7.0 mmol/L
Oral glucose tolerance test (OGTT)/2 hour post prandial glucose level following 75 grams of oral glucose	≥200 mg/dL
Random plasma glucose	≥200 mg/Dl
Glycosylated hemoglobin (HbA1c)	HbA1c ≥6.5%

Diagnosis of pre-diabetes: can be made with any one of the following criteria

Fasting plasma glucose	100–125 mg/dL
Impaired glucose tolerance (IGT)2 hour post prandial glucose level following 75 grams of oral glucose	140–199 mg/dL
HbA1c	≥5.7%–6.4%

PERIODONTAL PARAMETERS THAT MAY FORETELL HYPERGLYCEMIA:

Multiple periodontal abscesses

Severe periodontal destruction in terms of probing pocket depth, clinical attachment loss, alveolar bone loss and tooth mobility. Screening for incident diabetes is recommended in patients who (no self-reported personal history of diabetes) present with advanced periodontal destruction.[4]

Suppuration from pockets

Increased number of sites that bleed on probing after meticulous phase 1 therapy.

TYPE OF DIABETES AND PERIODONTAL TREATMENT OPTIONS:

Individually tailored treatment approaches regarding timing and duration of procedure, type of glucose evaluation, alterations in dosage of current diabetic medications or addition of adjunctive hypoglycemic agents and antibiotic prescriptions may be considerations that guide periodontal/implant therapy in the diabetic patient.

Type 1 diabetic patients are more prone for hypoglycemic attacks due to their vulnerability to glycemic fluctuations and peak drug activity. Therefore, these patients need careful treatment planning, and an adequately equipped dental office.

GLYCEMIC STATUS AND TREATMENT OPTIONS:

Regardless of the type of diabetes, glycemic levels significantly determine treatment options in the patient with periodontal diseases.

All periodontal treatment procedures may be performed in the well controlled diabetic patient.

Non-surgical periodontal therapy (NSPT) can be carried out in all diabetic periodontitis patients at the baseline visit regardless of their glycemic status. There is no absolute contra indication to NSPT in all diabetic patients. Control of active inflammation can be achieved.

Elective surgical periodontal therapy may be carried out only if HbA1c values are less than 8%.
The fasting blood glucose levels on the day of surgery should be less than 180 mg/dL (10 mmol/L) or random blood glucose levels may be less than 200 mg/dL (11 mmol/L)
Poorly controlled diabetic patients-HbA1c values >8, should be placed in supportive periodontal care and surgical procedures may be done when HbA1c is <8%
Periodontal surgical procedures should not be done in diabetic patients reporting with HbA1c >10%
Emergency management in such patients may be done only in consultation with the physician.
It is recommended that emergency surgical periodontal procedures may not be performed if random blood glucose level is >234 mg/dL (13 mmol/L)
All diabetic patients reporting with HbA1c >8% should be referred for prompt medical examination.

MANAGEMENT OF BACTEREMIA IN THE DIABETIC PATIENT WITH PERIODONTAL DISEASES:

Routine use of pre operative antibiotics to prevent bacteremia is not recommended in all diabetic patients seeking periodontal therapy. The decision to use systemic antibiotics in the diabetic patients should be done only after a benefit to risk assessment, tailored to individual patient situations.
The use of a pre procedural non-alcohol-based chlorhexidine mouth rinse 0.12% (15 mL) or 0.2% (10 mL) should be used before all procedures is recommended to reduce risk of transient bacteremia.
Use of adjunctive antibiotics in non -surgical periodontal therapy is not routinely recommended and should be considered only in cases of severe periodontal destruction.
In the management of periodontal abscess in the diabetic patient, incision and drainage should be done and need for antibiotics decided according to local and systemic conditions in the patient.
Attention should be directed towards adequate control of glycemic status.

PERI AND POST OPERATIVE SURGICAL CONSIDERATIONS FOR THE DIABETIC PATIENT WITH PERIODONTAL DISEASES:

Mean plasma glucose must be determined on the day of surgery (Both prior to and after surgery)
Morning appointments can be scheduled for the patient with diabetes as endogenous cortisol levels are highest and risk of hypoglycemia is minimal during this time.

Patients must be advised that they have to report for dental procedures after their normal food and prescribed drug intake and the same has to be confirmed before start of procedure.Anxiety and stress reduction protocols should be followed and short appointments are advised. If procedures last for a duration of more than 2 hours, intra-operative glucose monitoring is recommended.
For patients on insulin, the timing of dental procedures should be adjusted in a manner that it will not coincide with peak insulin activity of the drug. An advice from the diabetologist may be taken for extensive surgical procedures.
For the well-controlled diabetic patient, most periodontal procedures may be performed routinely.If dental procedures may alter pre-operative food or drug intake (In procedures under conscious sedation) dosage of drugs need to be adjusted in consultation with the diabetologist. If dental procedures may alter post operative dietary habits, a food and diet plan have to be established in consultation with the patient's diabetologist.Hypoglycemic agents such as sulfonylureas, meglitinides, and their combinations and insulin may put the diabetic periodontitis patient on increased risk of hypoglycemia.In a pre-operative fasting patient, sulfonylureas such as glibenclamide, glimepiride, and glipizide may trigger insulin production and cause hypoglycemia. If the patient has accidentally taken the medication, surgical procedure may still be completed with careful glucose monitoring and intravenous dextrose when required.Glycemic status during the post operative healing phase is critical. Patients must adhere to all dietary instructions from the diabetologist.
Attention to be directed towards infection and pain control. Post-operative appointments have to be scheduled to assess healing or any infections.

DENTAL IMPLANTS AND REGENERATIVE PERIODONTAL THERAPY IN THE DIABETIC PATIENT:

Both dental implants and regenerative periodontal therapy are successful in the well controlled diabetic patient.Strict maintenance of glycemic status, periodic maintenance visits and meticulous home care will enhance treatment outcomes.

HYPOGLYCEMIA IN THE DENTAL OFFICE:

Hypoglycemia occurs when plasma glucose levels fall below 70 mg/dL. It has to be recognized early because if unattended, hypoglycemia may be life threatening.
Causes of hypoglycemia:
Insulin or other hypoglycemic agents may induce hypoglycemia
Inadequate food intake
Excessive alcohol consumption
Unanticipated excessive physical activity

SIGNS, SYMPTOMS AND MANAGEMENT OF HYPOGLYCEMIA

Signs and symptoms	Emergency management
Mild Hunger Fatigue Sweating Nausea Abdominal pain Headache Tachycardia Irritability/Uncooperative patient	Stop the operative dental treatment immediately Awake/alert patient Administer 15 g of oral carbohydrate (i.e., glucose tablets or gel or powder, 180 mL Sweetened orange juice, 15-25 mL of sugar water) Monitor blood glucose and repeat carbohydrate dosing as necessary
Moderate Incoherence Uncooperative Belligerence Restrictive behavior	Seek emergency medical assistance Administer 20-50 mL of 50% dextrose solution intravenously Administer glucagon 1 mg as available subcutaneously or intramuscularly, followed by oral glucose supplement, especially in type 1 diabetes patients and those on insulin therapy. It should be avoided in those on sulfonylurea therapy
Severe Unconsciousness Seizures	Seek emergency medical assistance Administer 20-50 mL of 50% dextrose solution

SUPPORTIVE PERIODONTAL THERAPY IN THE DIABETIC PATIENT WITH PERIODONTAL DISEASES:

All diabetic patients with periodontal disk should be informed about the bi-directional nature of the two diseases and the possible risks of not adequately controlling either of the two diseases.A well-controlled diabetic patient has no greater risk of recurrence of periodontal disease than the non-diabetics.

Well controlled diabetic patients may be advised for a maintenance visit once in every 2-3 months based on periodontal risk assessment and glycemic status. For a poorly controlled diabetic, follow up visits, once in every 1-2 months post NSPT has to be advised during the first year. After achieving glycemic control and completion of surgical therapy if indicated, they may be placed on recall visits every 2-3 months.To manage the altered oral environment in the diabetic patient, home care instructions and adjunctive aids such as interdental cleansing devices, mouthwashes and specific dentifrices may be recommended.

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VIRDENTOPSY: A PARADIGM SHIFT IN FORSENSIC ODONTOLOGY

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ABSTRACT
Forensic odontology, a cornerstone of forensic science, plays a pivotal role in establishing human identity by examining dental remains and records. Forensic odontology's evolution from manual to digital methods signifies a crucial transition. Virtual Autopsy appears as a helpful and complementary tool for dental and medical cadaveric examination. Using high-tech radiological approaches, Virtual Autopsy may provide, through images, an efficient and more accurate view on the individual case.
Key words: Virtual, Autopsy, Forensic Odontology, DNA

INTRODUCTION

The identification of the deceased requires the contribution of several forensic experts, depending on the status of the remains. There are numerous methods to investigate the evidence used to identify human remains. These include visual recognition; DNA; dental data, fingerprints; and physical evidence such as tattoos, scars, surgical implants, metal crowns etc.[1,2] Forensic dentistry has become a vital part of forensic science that plays a lead role in the identification of deceased individuals who cannot be recognised visually or by any other means.[3]

The traditional forensic investigations are now been replaced by digital forensics in terms of acquisition, analysis, and accurate reporting of forensic evidence. [4]

Digital forensics can be defined as "application of computer science and investigative procedures for a legal purpose involving the analysis of digital evidence." Due to updation and advancements in software, the application of digital forensic investigations is blooming at a faster pace, especially in mass disasters such as terrorism, aviation, tsunamis, earthquakes and landslides. Besides this, dental radiographs play an integral role in identification and age estimation by comparison of antemortem (AM) with postmortem (PM) data after provisional recognition of the suspect. In the modern era, digital radiographs have considerably reduced the errors in interpretation or incorrect identification as with conventional radiographs.[5]

IThe Virtual Dental Autopsy Project (VIRDENTOPSY)

The term VIRDENTOPSY amalgamates the terms "virtual" and "dental autopsy". The term virtopsy was created from the terms 'Virtual' derived from the Latin word 'virtus', which means 'useful', 'efficient and good'. The term autopsy is a combination of the classical Greek term, 'autos', meaning 'self' and 'Opsomei', meaning 'I see'[6]

The project associates research topics such as pathology, odontology, anthropology, and archaeology under the umbrella of human rights of the dead and humanitarian forensic odontology. [7,8,9]

Virdentopsy involves systematic collection of post-mortem dental data performed by forensic pathologists, dentists with no forensic background, dental hygienists with a forensic background, or other forensic operators authorized in the mortuary.

The postmortem dental data is collected followed by which preliminary investigation is carried by forensic odontologists

Data received will be transmitted to the human identification laboratory, where multiple forensic odontologists evaluate the data received and provide charting and the dental autopsy report.[10]

The data collection method on unidentified human remains consist of the following steps:

1.Intra oral cameras or smartphones are utilized for capturing 2D or 3D video recordings of the dental arches and oral cavity (Figure 1)

2. Photographic collection of the maxillary and mandibular arches.
3. Photogrammetry of the dental arches using an intraoral scanner (Figure 2)
4. 3D scanning of jaws and skull.
5. Intraoral radiographic collection using digital sensors.
6. Any radiographic imaging of the skull Live streaming using smartphone and smart glasses (Figure 3)

FIGURE 1

FIGURE 2

FIGURE 3

Figure Courtesy: Nuzzolese E. VIRDENTOPSY: Virtual Dental Autopsy and Remote Forensic Odontology Evaluation. Dent J (Basel). 2021 Sep 5;9 (9):102.

MODERN VIRTOPSY VERSUS CONVENTIONAL AUTOPSY

In conventional biopsy, all the organs are removed and examined thoroughly which makes it difficult for second autopsy surgeon to conclude findings with all displaced and dissected organs with loss of normal architecture.

Virtopsy researchers make use of computed tomography (CT) and magnetic resonance imaging (MRI) for the detection of the outcomes as adjunctive aids in the older days, but the new combined modern virtopsy method uses angiographic methods, CT scanning as such, photogrammetry or three dimensional (3D) surface documentation and MRI.

The application of multidetector or multislice CT and MRI, high resolution micro CT and micro MRI, magnetic resonance spectroscopy, image guided percutaneous biopsy, PM angiography, PM identification, PM ventilation, non-invasive tool, and data display control such as the integration of Kinect camera or 3D printing and rapid prototyping along with conventional virtopsy have added a lot to the field of clinical forensic medicine.[11.12]

APPLICATIONS OF VIRTUAL AUTOPSY

The Virtual Autopsy has been a promising helping tool in various number of forensic situations, such as thanatological investigations; carbonized and putrefied body identifications; mass disaster cases; age estimation; anthropological examinations and skin lesion analyses.

The cause of death can be identified in drowned bodies by the information obtained by CT imaging which states about the volume, density, size of the lungs and the amount of liquid observed in them.[13]

A case where the victim was struck by respiratory obstruction from a foreign body, the differentiation of the obstructive structure was performed with fusion imaging of computed tomography and magnetic resonance imaging.[14]

Another specific dental application for the Virtual Autopsy is the comparison between AM panoramic radiographs and PM reconstructed panoramic overviews of cranial CT images. The PM dental evidences can easily be related to the AM data of the expected missing person.[15]

ADVANTAGES

1.It is most effective in study of wounds including matching of the probable weapon. It helps to identify the entry wound, its tract and exit thus eliminating dissection step.

2. No scalpel, hence no hazard of infection acquired by the mortuary staff as well as the concerned doctors as the procedures is bloodless.

3. The whole architecture of the body is preserved so the mutilation of the body can be eluded
4. The body can be observed in layers from different angles for collection of evidence completely
5. It promises to ease the burden of determining identity and cause of death of large number of victims following natural disasters, such as earthquakes and tsunamis.

DISADVANTAGES

1.Small tissue injury may be missed.
2. All pathological conditions may not be possible to diagnose.
3. Cannot tell the colour of organs especially when inflammation is suspected.[16]

CONCLUSION

Virdentopsy is a newer approach towards dead and humanitarian forensic odontology especially in COVID-19 era worldwide. It not only optimizes the identification process in the field of forensic by utilizing the digital means on an inaccessibility of forensic odontologists at the working place and can take expert opinions by experienced odontologists remotely but also may be the source of education for the future generations.

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ARTIFICIAL INTELLIGENCE

Dr. Merlin Thomas MDS, Consultant Periodontist

Abstract
Artificial intelligence (AI) comprises wide range of technologies that perform various tasks which usually require human intelligence. This technology has been a helping hand in analyzing larger data
as well as in the process of decision making. AI now is in upfront in health sector due to its advanced
applications. Hence this review article summarizes in brief the role of AI in dental applications.
Keywords: artificial intelligence; caries detection; dentistry; machine learning; Pain assessment

INTRODUCTION

"Our intelligence is what makes us human, and artificial intelligence is an extension of that quality."
– Yann LeCun, Professor, New York University

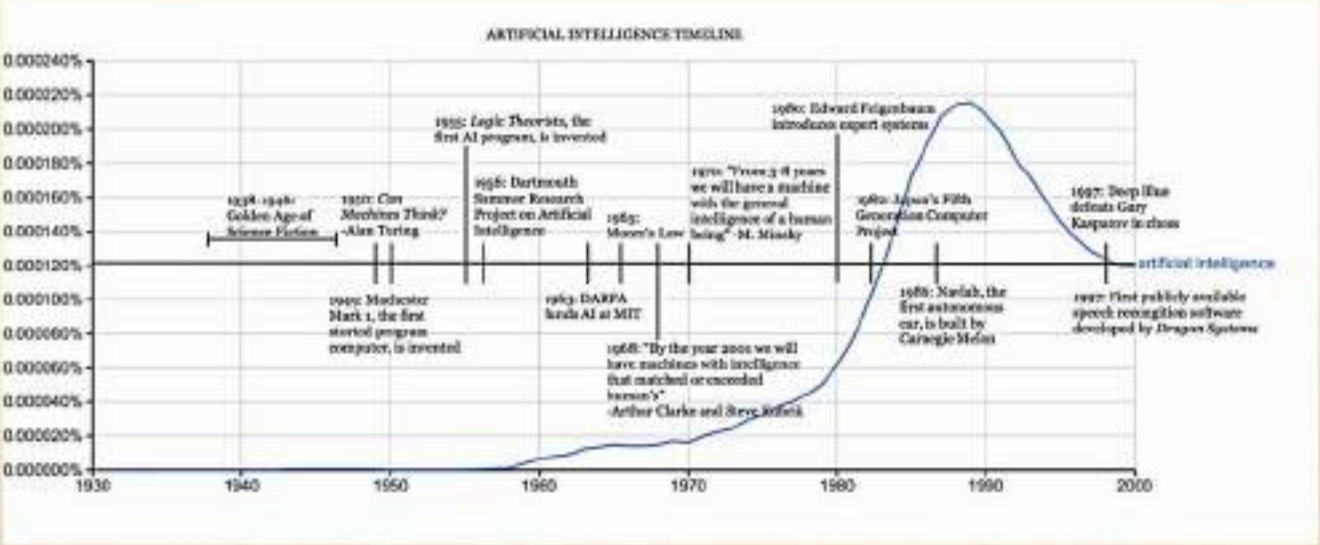
Ever since the field of science has originated, researchers have been solving the complexity of the human brain that is a maze of neurons interconnected with each other and transmitting signals to the whole body. To design a model that will mimic the human brain has remained a big puzzle to solve for the scientific community. Constant effort and hard work of researchers from several years results in the evolution of 'Artificial Intelligence.'

According to John McCarthy (1955) who coined the term 'Artificial Intelligence'defines it as "a field of science and engineering concerned with the computational understanding of what is commonly called intelligent behavior, and with the creation of artifacts that exhibit such behavior."

IHISTORY

In the first half of the 20th century, science fiction familiarized the world with the concept of artificially intelligent robots. By 1950's various thoughts on artificial intelligence (AI) emerged. One such was Alan Turing, a British mathematician who explored the mathematical possibility of AI. Turing suggested suggest that machines can use available information and reason to solve problems like humans. This was the logical framework of his 1950 paper, Computing Machinery and Intelligence in which he discussed how to build intelligent machines and how to test their intelligence. Then in 1956, John McCarthy and Marvin Minsky presented the Dartmouth Summer Research Project on Artificial Intelligence.

This event catalyzed the next twenty years of AI research.[1] We now live in the age of "big data," an age in which we have the capacity to collect huge sums of information too cumbersome for a person to process. Thus the application of AI in this regard has been fruitful in industries such as technology, medicine, banking, marketing, and entertainment



ARTIFICIAL INTELLIGENCE TIMELINE

TECHNIQUES OF ARTIFICIAL INTELLIGENCE

Computer-based diagnosis is gaining momentum due to its ability to detect and diagnose lesions which may go unnoticed to the human eye, thereby paving way for a holistic practice. The various techniques of AI which are being applied in medical field include artificial neural networks (ANN), genetic algorithms (GA) and fuzzy logic.

Artificial neural networks (ANN): Artificial neural networks are highly interconnected network of computer processors that are inspired by the biological nervous systems. The most important advantage of ANNs is that this system solves problems which are too complex to conventional techniques and also, those that do not have an algorithmic solution can be solved with the help of ANN. It consists of a variable number of artificial neurons or nodes connected in hierarchical layers: an input layer, one or more hidden layers, and an output layer. Each node, with the exception of the input neurons, receives multiple weighted inputs and produces an output that is usually a nonlinear function of the inputs. A neural network 'learns' through repeated adjustments of these weights. Their ability to learn from historical examples, analyze non-linear data, handle imprecise information and generalize enabling application of the model to independent data has made them a very attractive analytical tool in the field of medicine.

They have been used in the clinical diagnosis, image analysis in radiology and histopathology, data interpretation in intensive care setting and waveform analysis.[2] A study done by Kim et al.2009 used ANN to build a model that can predict toothache on the basis of association between toothache and daily toothbrushing frequency, toothbrushing time, use of dental floss, toothbrush replacement pattern, undergoing scaling and other factors like diet and exercise.[3] This successful study aided development of a toothache predictive model with great accuracy. This model recognizes adequate eating habits, oral hygiene, and stress prevention as the most important factors in preventing toothaches.

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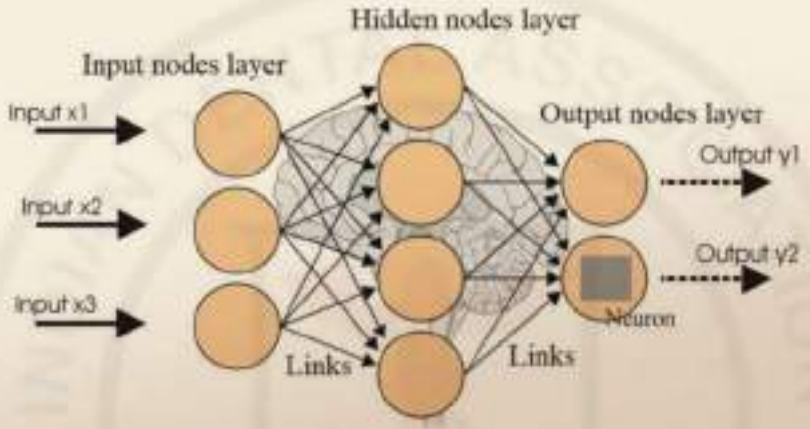
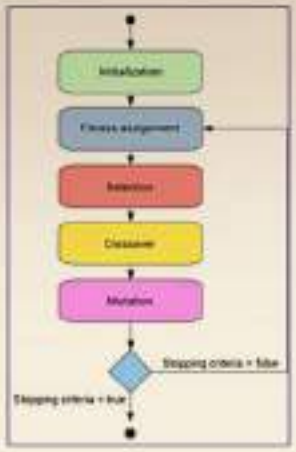


Genetic algorithms: Inspired by Darwin's theory, the genetic algorithm is a part of evolutionary algorithms, specifically to generate high-quality solutions to optimization and search problems by relying on biologically inspired operators such as mutation, crossover and selection. They are based on the principle of survival of the fittest in natural selection. Its greatest advantage over conventional methods is that it works on the basis of problem solution instead of analytical relations. Lodygowski T et al.2009 used genetic algorithms for optimization of dental implant system to reduce the problem of mechanical fracture and to provide long term strength to the implant.[4]



FLOW CHART OF GENETIC ALGORITHMS

FUZZY LOGIC: It provides valuable reasoning for the fuzzy problem thus enabling in decision making. The idea behind fuzzy logic is to imitate human reasoning ability that works with not so clear terms. Mago et al.2011 designed a fuzzy logic based expert system that accepts imprecise values of dental sign and symptoms associated with mobile teeth to assist dental professionals in decision making.[5]

IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN DENTISTRY

Artificial intelligence in Dentistry started procuring its role with emergence of data computation and availability of large amounts of patient data.

1. Diagnostic dentistry: Artificial neural networks work can be used where the etiology of disease is multifactorial. For example, Recurrent aphthous ulcer, a condition whose precise etiology is not known, and the diagnosis is made on its reoccurrence and by exclusion of other factors. Thus, revealing the importance of AI in diagnosis of oral diseases without chances of human errors.[6]
2. Patient management: It can book a patient's appointment, take medical and dental history of the patient and assist dental surgeon in diagnosis and treatment planning. It also informs the about the habitual details of patients like use of tobacco or alcohol. Thus, a virtual database of every patient can be created.
3. Orthodontics: AI are used in various phases of orthodontics. 3D scans and virtual models are useful in assessing craniofacial and dental abnormalities.[7] With the help of these 3D scans, aligners can be printed and treatment can be customized. Then a data algorithm is created that
decides how the teeth of the patients should be moved and how much pressure should be applied. The AI conjugated aligners provide precise treatment, reduction of errors and treatment time.
4. Radiology: AI can identify minute deviations from normal which remains unnoticed by human eye. Studies have shown the use of ANN to localize minor apical foramen thereby magnifying the precision of working length determination by radiographs and in diagnosis of proximal caries.[8]
5. Restorative/prosthetic dentistry: In order to render ideal esthetic prosthesis for the patient factors such as facial measurements, anthropological calculations, ethnicity, patient preferences has been integrated by AI. It is also used to design inlays, onlays, crowns and bridges and also for precise fit of prosthesis. With the help of Artificial Intelligence, the computer can actually guide the dentist during the entire procedure of making a digital impression and aid in making an ideal impression.[9]

6. Periodontics: A Digital Convolution Neural Network based system that consists of 16 convolution layers and two fully connected layers for detecting periodontitis of premolars and molars was developed.[10] ANN can also be used in categorizing patients into aggressive periodontitis and chronic periodontitis based on their immune response profile. Rana et al. 2017 presented an autoencoder framework with convolutional layers to segment gingival diseases from oral images. This model successfully distinguishes between inflamed and healthy gingiva.[11]
7. Head and Neck Cancer: The ANN are of importance for the identification and grading of patients with a high risk of oral cancer or precancer and further to plan a treatment regime. Ibragimov and Xing et al.2016 were the first to attempt the use of convolutional neural networks (CNN) for segmentation of organs at risk from head and cancer CT images. Their results confirmed that CNNs well-generalize the intensity appearance of objects with recognizable boundaries whereas additional information may be required for CNN-based segmentation for the objects with poorly recognizable boundaries.[12]
8. Pain assessment: Xiao-Su Hu et al.2019 conducted a study where ANN achieved an optimal classification accuracy at 80.37% for pain and no pain discrimination.[13]
9. Surgery: Successful clinical application in image-guided surgery in the cranial area includes oral implant surgery, removal of tumor and foreign bodies, biopsy, and temporomandibular joint surgery. Few comparative studies in the literature of using AI in oral implant surgery indicate significantly more accuracy compared to manual freehand procedures performed by experienced surgeons. In spite of that shorter operation time, safer manipulation around delicate structures and higher intraoperative accuracy has been recognized with the help of AI. Image guidance allows thorough surgical resection which may decrease the requirement of revision procedures.[14]

BENEFITS OF AI IN HEALTH CARE

AI in the healthcare sector provides a new transfiguring drive that will bring about advancements for diverse clinical specialties as well as hospital operations. With the fact that modern healthcare facing a lot of challenges in collecting, analyzing and applying structured and unstructured data to diagnose and treat diseases, AI systems with their data mining and recognition abilities provides adequate methods for patient care and an effective treatment at correct time. Its benefits include:

1) AI enable more curated, systematic and structured collection of patient's data.
2) AI is suitable to overcome the variations in patient's examination and facilitate effective care while lowering costs of the treatment by reducing routine tasks.
3) AI facilitates research and development by introducing Insilco experimentation options.
4) Reduces tedious task of collecting patient's details before treatment thus increasing more time of face-to-face discussion between patient and clinician.
5) AI promises to make healthcare more participatory.
6) Diagnostic and treatment costs are reduced.

DISADVANTAGES

Though AI based systems have promising role, there exist technical issues. AI is controlled and conducted by computer scientists without any medical training which can be a problem-oriented approach in healthcare delivery. AI also can't replace contemporary healthcare delivery models whose working depends on clinician skills and patient-clinician communication. Use of robotic assistants has also created various issues in healthcare. Preferable suggestion is a model which accommodates both AI and human elements so that the process of data collection and categorization becomes easy and at the same time preserve the human aspects of clinical care. Another factor is enormous data is required for training and precision and therefore is it is difficult to achieve accuracy in rare conditions or diseases.

CONCLUSION

Applications of AI in everyday life are growing leaps and bounds. Dentists have always been at the forefront of implementing a technology. Hence, understanding the various concepts and the techniques involved will have a clear advantage in the future when it is time to adapt to the change with redefined roles for a rewarding practice.

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ANAEMIA IN CHILDREN -A REVIEW

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ABSTRACT
This review highlights the various anaemias commonly occurring in children, its prevalence in India and the threat it poses to a child on a global level. The various causes of anaemia, its classification and the multiple oral manifestation that it presents enables the physician and the dentist to diagnose and differentiate the various forms of anaemia at the earliest and manage them appropriately. Also the various means and steps that aid in diagnosis using the blood samples and running various tests have been noted. The prevention protocol for anemia in infants and toddlers from birth through 3 years of age and the adolescents will act as a guide to the general population at large. Paediatricians and other health care providers should strive to eliminate iron deficiency and iron-deficiency anemia as it has detrimental effects on neurodevelopment.
Key words: anaemia, haemoglobinopathies, oral manifestations, iron deficiency anaemia

IINTRODUCTION

An abnormally low haemoglobin level (less than 11g/dl; according to WHO classification) due to pathological condition(s) is defined as anaemia. It is worth noting that multiple causes of anaemia can coexist in an individual or in a population and contribute to the severity of the anaemia.[1] Iron deficiency is one of the most common cause of anaemia. Iron is an important constituent of red blood cells and haemoglobin. Reduced iron content in the body leads to lowered production of haemoglobin, which in turn reduces the oxygen carrying capacity of the blood. This reduced supply of oxygen through blood to various organs of the body has several deleterious effects on the organ. Other causes of anaemia include chronic infections, particularly malaria, hereditary haemoglobinopathies. Various nutritional deficiencies like folic acid and Vitamin B12 deficiency, excessive bleeding due to menstrual periods, bleeding in the digestive or urinary tract, surgery, trauma or cancer can also cause blood loss leading to reduced RBC count, thereby resulting in anaemia.[2]

Many anaemia like nutritional deficiency anaemia and iron deficiency anaemia can be treated if proper diagnosis of the cause is known at the earliest. A combined effort put forth by the physician, parent and the child can resolve these conditions and deliver a healthy living and growth to the child. In 2012, the World Health Assembly Resolution 65.6 endorsed a Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition (CIP), with six Global Nutrition Targets for 2025; nutritional anaemia being one of the major concerns.[3]

This review intends to throw light on the prevalence of anaemia in Indian population; its major causes, oral manifestations and general symptoms that can help diagnose the disease. Also the appropriate treatment for the age defined deficiencies and various means of preventing the disease is highlighted in this article.

Anaemia in India

Anaemia is a widespread public health problem associated with an increased risk of morbidity and mortality, especially in pregnant women and young children.[1] Globally 1.62 billion people are anemic, while the prevalence of anaemia in children is 47.4%. Nutritional anaemia in South Asia accounts for nearly half of global cases of anaemia. In India, anaemia continues to be the major health problem in young children, adolescent girls, and pregnant women. Approximately 50% of the population suffers from nutritional anaemia as known in countries where meat consumption is low.[4]

In India, about 89 million children are anaemic. The prevalence of anaemia was 70% in children aged 6–59 months.[5] The highest prevalence of anaemia was seen in children <10 years, especially in those <5 years.[6] Iron deficiency is one of the most common causes of anaemia.[7] Besides iron, other nutrients such as vitamins A, E, and C also play key role in formation and protection of red blood cell (RBC) by stimulating stem cells as well as by activating a number of antioxidant enzymes.[8] Therefore inadequacy of any of these micronutrients may lead to anaemia in the vulnerable sections of population.

Cause

Anaemia is caused by either a decrease in production of red blood cells or haemoglobin, or an increase in loss (usually due to bleeding) or destruction of red blood cells.

Various causes of anaemia are as follows:[2]

A. Decreased or ineffective marrow production:

- Lack of iron, vitamin B12 or folate
- Hypoplasia
- Invasion by malignant cells
- Renal failure
- Anaemia of chronic disease

B. Peripheral causes:

- Blood loss
- Haemolysis
- Hyperspleenism

CLASSIFICATION OF ANAEMIA: [2]

1.Normochromic, normocytic anaemia (Normal MCHC, ormal MCV)
a. Anaemias of chronic disease
b. Haemolytic anaemias
c. Anaemia of acute haemorrhage
d. Aplastic anaemia
2. Hypochromic, microcytic anaemia (low MCHC, high MCV)
a. Iron deficiency anaemia
b. Thalassemias
c. Anaemia of chronic disease
3. Normochromic, macrocytic anaemia (normal MCHC, high MCV)
a. Vitamin B12 deficiency
b. Folate deficiency

DIFFERENT ANAEMIAS AND THEIR ORAL MANIFESTATIONS:

Anaemia of chronic disease:-

This type of anaemia shows general symptoms like paleness of skin, fatigue, lightheadedness, shortness of breath, increased heartbeat, irritability, chest pain. Oral manifestations are not prevalent. [2]

Aplastic anaemia:-

It occurs due to failure of hematopoietic precursor cells in bone marrow to produce adequate number of all three types of blood cells: red blood cells (anaemia), white blood cells (leukopenia) and platelets (thrombocytopenia)
Oral manifestations:- Pallor of oral mucosa, petechiae, submucosal echymosis, gingival hyperplasia, gingival bleeding, oral candidiasis, herpetic lesion, ulcers covered with black or gray necrotic membrane.[8,9,10]

Iron deficiency anaemia: -

As name suggests iron deficiency anaemia is caused by lack of iron in the body. Iron is an important constituent for the formation of haemoglobin and thereby RBCs. This nutritional iron deficiency is more common in females as compared to males. It is mainly caused due to inadequate intake, malabsorption, increased requirement, increase loss and gastrotomy.
Oral manifestation:-
Mucosal pallor, atrophic mucosa, angular cheilitis, glossitis, migratory glossitis, cheilosis, candida infection, dehydration and ulceration due to atropy of mucosa are the main oral manifestations of iron deficiency anaemia.[9,15,16]

Thalassemia: -

It is an inherited blood disorder in which body has an abnormal production of haemoglobin. α thalessemia occurs when a mutation in a gene that codes for alpha globin on chromosome 16 is reduced or absent, while β thalassemia occurs with a corresponding change in the beta globin on chromosome. Both are essential for haemoglobin production.

Oral manifestations: - Oral manifestations are not significant. Oral mucosal palor can be observed

Facial deformities:-Excessive overgrowth of maxilla leading to excessive lacrimation and nasal stiffiness, rodent facies, chipmunk facies.

Radiographic features include coarsening of trabecula and blurring resulting "salt and pepper effect" thickening of diploe of skull. Inner and outer plates become elongated producing bristals like crew cut or hair on end appearance. [11,12]

Pernicious anaemia:-

It is also called Primary anaemia, Addison's anaemia, Biermer's anaemia. It is due to deficiency of intrinsic factor namely mucoprotein in stomach. The intrinsic factor is necessary for absorption of vitamin B12 which is an essential factor for erythropoiesis.

Oral manifestations:- Glossitis, beefy red tongue, hunter's glossitis (The papilla undergoes atrophy with loss of papillae, becomes smooth or bold glossitis with glossopyrosis and glossodynia), xerostomia, apthous ulcers.[9]

Vitamin B12 (cyanocobalamin) deficiency:-

Oral manifestations:- Angular cheilosis, mucositis, stomatitis, sore or burning mouth, hemorrhagic gingival, halitosis, epithelial dysplasia of oral mucosa, oral paresthesia, detatchment of periodontal fibres, loss or distortion of taste, glosssitis oral pain, ulceration, ulcerative gingivitis, denuded tongue, glositis, glossodynia, tongue is beefy red, smooth and glossy, delayed would healing, xerostomia, bone loss, apthous ulcer.[17]

Folic acid deficiency:-

Oral manifestations:- Angular cheilosis, mucositis, stomatitis, sore or burning mouth, increased risk of candidiasis, inflamed gingival, glossitis, oral pain, ulceration, ulcerative gingivitis, denuded tongue, glositis, glossodynia, tip or borders of the tongue are red swollen, slick bald pale, apthous ulcers.[17]

Sickle cell anaemia: -

It is an autosomal recessive condition which occurs due to gene mutation. In all forms of sickle cell anaemia one or two abnormal gene makes haemoglobin S. Due to the presence of this mutant gene erythrocytes lose their normal biconcave shape and have an abnormal sickle like shape, which reduces both their plasticity and lifetime.

ORAL MANIFESTATIONS

Pallor buccal mucosa, gingival enlargement, orofacial pain, paresthesia of mental nerve, delayed eruption, enamel hypoplasia, osteomyelitis, asymptomatic pulpal necrosis and severe malocclusion are the main oral manifeststions.

Radiographic features include osteoporiosis, marrow hyperplasia, ground glass appearance, thinning of the inferior border of mandible, prominent lamina dura, step ladder pattern, hair on end appearance.[9,13-16]

COMMON SYMPTOMS

Most symptoms of anaemia are a result of the decrease of oxygen in the cells or "hypoxia." Because red blood cells, as haemoglobin, carry oxygen, a decreased production of these cells result in "hypoxia." Many of the symptoms will not be present with mild anaemia, as the body can often compensate for gradual changes in haemoglobin.

The following are the most common symptoms for anaemia. However, the symptoms may vary from one individual to other. The symptoms may include, but are not limited to, the following:[2]

- Abnormal paleness or lack of colour of the skin.
- Increased heart rate (tachycardia).
- Breathlessness or difficulty catching a breath (dyspnoea).
- Lack of energy, or tiring easily (fatigue).
- Dizziness or vertigo especially when standing.
- Headache.

· Irritability.
· Irregular menstruation cycles.
· Absent or delayed menstruation (amenorrhea).
· Sore or swollen tongue (glossitis).
· Jaundice or yellowing of skin, eyes, and mouth.
· Enlarged spleen or liver
(splenomegaly, hepatomegaly).
· Slow or delayed growth and development.
· Impaired wound and tissue healing.

DIAGNOSIS

General examination:- this includes complete medical history and general findings. Complaints of tiring easily, pale skin and lips, or a fast heartbeat (tachycardia) should be enquired in detail.
Oral examination:- Physician or dentist can evaluate the oral manifestations described earlier.
Pathological examination:-
Most anaemias in children can be diagnosed with these blood tests:[2,18]
· Haemoglobin and hematocrit.
· Complete blood count or CBC.
· Peripheral smear.
· Reticulocyte count.
· Additional blood tests:- Bone marrow aspiration and biopsy - marrow may be removed by aspiration or a needle biopsy under local anaesthesia. In aspiration biopsy, a fluid specimen is removed from the bone marrow.

TREATMENT

Treatment for anaemia depends on its cause and the age at which it occurs
Infants (7-12 months)
For infants from 7 to 12 months' completed age, the recommended dietary allowance for iron, according to the IOM (Institute of Medicine)[18], is 11 mg/day, which was determined by using a factorial approach. Thus, it is recommended that exclusively breastfed term infants receive an iron supplementation of 1 mg/kg per day, starting at 4 months of age and continued until appropriate iron-containing complementary foods have been introduced.

Toddlers (1-3 years)

According to IOM the recommended dietary allowance for iron for children from 1 through 3 years of age is 7 mg/day. Ideally, the iron requirements of toddlers would be met with naturally iron-rich foods rather than iron supplementation. These foods include those with heme sources of iron (ie, red meat) and nonheme sources of iron (ie, legumes, iron-fortified cereals). Foods that contain vitamin C (ascorbic acid), such as orange juice, aid in iron absorption should also be included while foods that contain phytates (found in soy) which reduce iron absorption should be avoided.[19]

Adolescents (10-19 years)

For an adolescent girl who is anaemic and has heavy or irregular menstrual periods, hormonal treatment is prescribed to help regulate the bleeding.

Folic acid and vitamin B12 supplements may be recommended for anaemia due to a deficiency of these nutrients. However, this is rare in children.

Anaemia caused by an infection will usually improve when the infection passes or is treated. If a certain medicine appears to be the cause, the doctor may discontinue it or replace it with something else (unless the benefit of the drug outweighs this side effect).

Depending on the cause, treatment for more severe or chronic forms of anaemia may include:

- transfusions of normal red blood cells taken from a donor
- removal of the spleen
- medicines to fight infection or stimulate the bone marrow to make more blood cells

In some cases of sickle cell anaemia, thalassemia, and aplastic anaemia, bone marrow transplantation may be used.

PREVENTION

Many kinds of anaemia cannot be prevented. But children can be prevented from iron deficiency, the most common form of anaemia. Before taking any form of medication or supplement for the treatment and prevention of anaemia, a consultation with the doctor is very important. Following points should be considered:[3,4]

- Limiting cow's milk. During their first 6 months, babies are usually protected against developing an iron deficiency by the stores of iron built up in their bodies before birth. But after month 6, they often don't get enough iron through breast milk alone or regular cow's milk (which contains less iron than fortified infant formula). Regular cow's milk can cause some infants to lose iron.

For these reasons, regular cow's milk is not recommended for children until they're 1 year old and eating an iron-rich diet. And they should not drink more than 24–32 ounces (709–946 ml) of milk each day. If you can't get your child to eat more iron-rich foods, speak with your doctor about giving your child an iron supplement.

For these reasons, regular cow's milk is not recommended for children until they're 1 year old and eating an iron-rich diet. And they should not drink more than 24–32 ounces (709–946 ml) of milk each day. If you can't get your child to eat more iron-rich foods, speak with your doctor about giving your child an iron supplement.

- Iron-fortified cereal and formula. These can help to ensure that an infant gets enough iron, especially during the transition from breast milk or formula to solid foods.[3]
- Well-balanced diet. Ensure that children regularly eat foods that contain iron and other essential nutrients. Good choices include iron-fortified grains and cereals, red meat, egg yolks, leafy green vegetables, yellow vegetables and fruits, tomatoes, molasses, and raisins.[4,18]

All these factors should be considered in order to prevent anaemia and suitable dietary modifications should be made at the earliest so that the child is prevented from the disease

.

CONCLUSION

Anaemia is the most common blood disease one can suffer as it is easily caused by heredity and our own body system and food intake. On the other hand, it can be prevented if extra care and efforts are put in to make sure one stays healthy and happy. One should get an immediate check up done if any of those symptoms as mentioned earlier begins and make sure to avoid those factors that can increase the chances of being an anaemic. That is to say if everyone works together we can reduce the percentage of people suffering from anaemia. In short, a healthy lifestyle leads to a happy life.

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AWARENESS ABOUT MANUSCRIPT WRITING AMONG DENTAL STUDENTS

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ABSTRACT

Aim and objective: To determine the impact of educational level on awareness about manuscript writing among undergraduate dental students. Materials and methods: A cross-sectional study was conducted on 100 students from a dental college in Thiruvalla, India. In October 2023, a self-administered anonymous and closed-ended questionnaire was created freely for students and interns to assess their knowledge and attitudes on manuscript writing. The questionnaire consisted of 15 questions. Results: In this study, out of 100 undergraduate dental students and interns, 63% were females and 37% were males. The awareness about manuscript writing among students varies not only with their gender but also with their educational level. Conclusion: We conclude that there is a lack of knowledge and awareness regarding the structure of manuscripts and basic principles in creating manuscript sections among dental students and interns. Furthermore, there is a dearth of awareness of the ethical elements related to producing papers, including knowledge of certain forms of scientific misconduct and practices. Manuscript writing was hampered by a lack of targeted research methods courses, expert workshops, and constructive mentoring help. Professional seminars are beneficial in increasing students' expertise and understanding of manuscript writing and scientific misconduct.

INTRODUCTION

Researchers are recognized for pushing the boundaries of knowledge. Updating knowledge and abilities is critical in the ever-changing area of health science. Publications serve as the foundation for evidence-based practice, which aims to provide the most efficient patient care possible while also improving professional knowledge. [1]

Although many professionals want to publish their research, the procedure might be stressful because this skill set is undervalued in the curriculum. [2] A professional may be a physician, academician, or researcher in and of itself, but contributing to the progress of their profession is an unavoidable obligation. Conducting research is a scientific method that, when coupled with the art of producing the document, has a good impact on many lives.

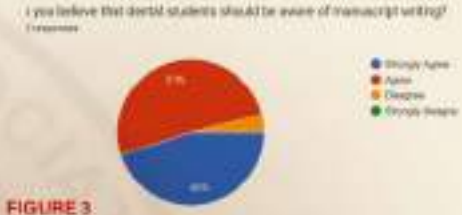
MATERIALS AND METHODS:

A cross-sectional study was conducted among dental students and interns in Thiruvalla, Kerala. In October 2023, a self-administered and closed-ended questionnaire was prepared and delivered to dental students and interns. The questionnaire consisted of 10 questions and requested for consent to participate in this study; the study was only undertaken when the participants' consent was obtained.

Confidentiality and anonymity were confirmed so that responses could not be linked to individual participants.

FIGURE 1

FIGURE 2



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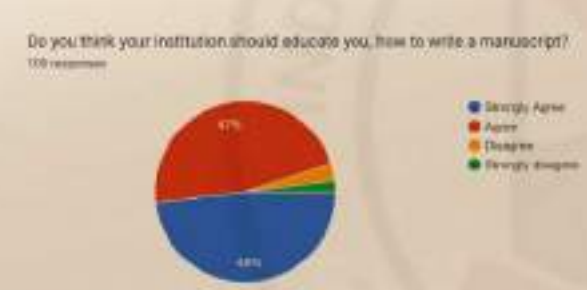

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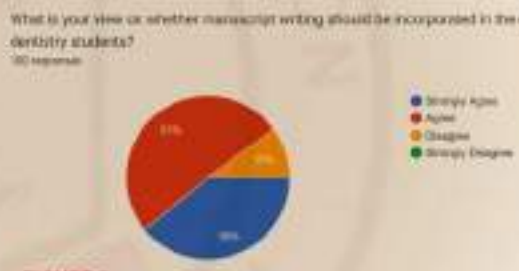

FIGURE 5

FIGURE 6

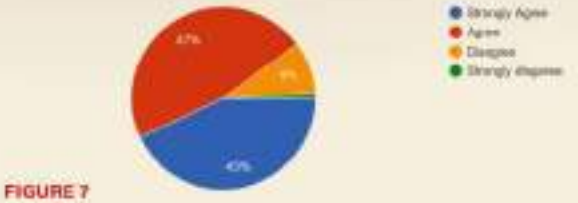

FIGURE 7

FIGURE 8

Per your knowledge, when writing the introduction of the manuscript, you should move from broad to detailed information.

99 responses

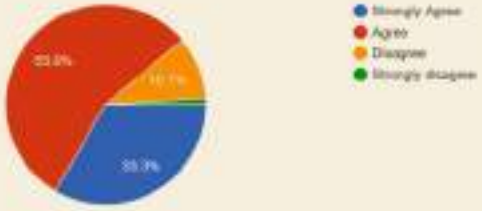

FIGURE 9

Do you think that the abstract should illustrate study objectives, setting, population, methods, major findings, and brief conclusions.

99 responses

FIGURE 10

Do you believe that the results of the study should be written in objective manner.

99 responses

FIGURE 11

Per your knowledge, do you agree that the first paragraph of your introduction should define the problem.

99 responses

FIGURE 12

Per your knowledge, the discussion section should start with statement of major finding.

99 responses

FIGURE 13

Do you think that the reference list should be formatted per journal style and includes accurate information.

99 responses

FIGURE 14

Do you believe that the major reason students struggle to write manuscripts is a lack of writing experience and training?

100 responses

FIGURE 15

RESULTS:

Of 100 undergraduate dental students and interns, 63% were females and 37% were males (FIG 1). Undergraduate students involved in the study were third years and final years (FIG 2). In evaluating the questionnaire, the participants who believe they should aware about manuscript was about 45% of students strongly agreed, 51% agreed and 4% of students disagreed (FIG 3). 48% of participants were strongly agreed that their institution should educate them about how to write manuscript, in which 47% agreed, 3% disagreed and 2% of students strongly disagreed (FIG 4). About 39% of participants strongly agreed and 51% agreed that their institution should incorporate that how to write manuscript in their curriculum of which 10% disagreed (FIG 5).

About 44% of participants strongly agreed that aware of manuscript writing can ais them in their research preparations, 44% agreed the concept and 4% disagreed. (FIG 6). 43% participants strongly agreed and 47% agreed that manuscript writing necessitates knowledge of the target journals and guidelines; in which 9% disagree and 1% strongly disagreed (FIG 7). About 42.4% participants strongly agreed and 47.5% agreed the concept that the manuscript title should include an informative description of the research population, design, intervention and outcome measure, in which 9.1% disagreed and 1% strongly disagreed (FIG 8). 33.3% participants strongly agreed and 55.6% agreed the concept while writing the introduction of manuscript they should move from broad to detailed information, in which 10.1% disagreed and 1% strongly agreed (FIG 9). About 42.4% participants strongly agreed and 53.5% agreed that the abstract should illustrate study objectives, setting, population, methods, major findings and brief conclusions, in which 3% disagreed and 1% strongly disagreed about this concept (FIG 10).

About 53.5% participants agreed and 42.4% participants strongly agreed the concept that the first paragraph of the introduction should define the problem; in which 3% disagreed and 1% strongly disagreed the concept (FIG 11). 33.3% participants strongly agreed and 51.5% agreed that the results of the study should be written in objective manner; in which 14.1% disagreed and 1% strongly disagreed (FIG 12). About 58.6% participants agreed and 29.3% strongly agreed that the discussion section should start with statement of major finding in which 11.1% disagreed and 1% strongly disagreed (FIG 13). 36.4% participants strongly agreed that the reference list should be formatted per journal style and includes accurate information; 55.6% agreed this concept; in which 5% were disagreed and 3% strongly disagreed this concept (FIG 14). About 49% participants strongly agreed and 46% agreed that the major reason students struggle to write manuscripts is lack of writing experience and training (FIG 15).

DISCUSSION:

Publication in high-quality journals is a significant indicator of a researcher's academic success and accomplishments. Nonetheless, practical and linguistic constraints may hinder the capacity of beginning, such as graduate students, to write and publish. [3] Manuscript writing is an essential skill for all researchers; nonetheless, it appears that many are uninformed about how to write research papers. [4] The current study found that many students were unaware of the basic notions that should be covered in each text part. There was a lack of clarity on the goal of each part of the book and the appropriate writing tense. Students were confused about what to include in the introduction, the objective of the results/discussion sections, and how to report and discuss study findings. Many students in the current study were unconcerned about some survey items. This might imply a lack of awareness about survey questions, a lack of clarity in the questions, or a lack of information among students regarding varied formatting rules for manuscript parts. In general, understanding of manuscript structure was not associated to study stage. To create high-quality publications, national ethical institutes utilize a rigorous peer-review procedure, careful validation of statistical analysis, and specialist tools to identify plagiarism and image fraud. [5] For many researchers, scientific misconduct may originate from a desire to become well-known as a participant in worldwide studies, as well as a desire for financial benefit. Scientific misconduct may also be the consequence of researcher laziness, particularly in complex investigations that need work and regular evaluation. [6]When producing a study article, researchers may face a number of challenges. A survey of European researchers working at a big public health institution found that the primary problems in preparing a manuscript for publication were a lack of time to write or submit, as well as insufficient English and writing abilities.[7] One of the most successful approaches for improving writing abilities and facilitating manuscript publication is training seminars.[8] In our study it is evident that there is a lack of knowledge and awareness regarding the structure of manuscripts and basic principles in creating manuscript sections among dental students and interns. Furthermore, there is a dearth of awareness of the ethical elements related to producing papers, including knowledge of certain forms of scientific misconduct and practices. Manuscript writing was hampered by a lack of targeted research methods courses, expert workshops, and constructive mentoring help. Professional seminars are beneficial in increasing students' expertise and understanding of manuscript writing and scientific misconduct.

CONCLUSION:

This study indicates that integrating manuscript writing awareness in preuniversity education can help students to improve their knowledge in research projects at a higher level.

FINANCIAL SUPPORT AND SPONSORSHIP: Nil

CONFLICTS OF INTEREST:

There are no conflicts of interest.

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VITAMIN D AND ITS ROLE IN OSSEOINTEGRATION OF IMPLANTS

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ABSTRACT
The multipurpose hormone known as vitamin D is mostly created by the skin after being exposed to ultraviolet B radiation from sunshine. By regulating the metabolism of calcium and phosphate, it synchronises physiological processes, stimulates growth, and causes the teeth and bones to undergo the essential remodelling. It is well established that having high serum vitamin D levels promotes dental health and that getting enough sunlight can lower the risk of periodontal disease, which in turn affects implant success. Despite the strong correlation between vitamin D and bone metabolism, there is also a predicted close association between vitamin D and implant success.

KEYWORDS :Vitamin D, Osseointegration, Dental implants.

INTRODUCTION

Implants are the one of the most significant developments in modern dentistry. Dental implantology has grown to be one of the most active and promising fields of dentistry since the late 1950s, when titanium implants for intraoral usage became available. It is also a well-liked choice for oral rehabilitation among patients who are edentulous or partially dentate. Osseointegrated dental implants are frequently superior to conventional dentures for a number of reasons. Dental implant treatment may produce superior outcomes, particularly for those who find it difficult to adjust to traditional dentures or whose local host bone is not as robust as it should be. Numerous factors such as prosthesis and grafting materials connected to dental biomaterials, are necessary for osseointegration and healing following the insertion or restoration of dental implants. Additional factors may be connected to the operator's qualifications and experience. A dental implant's ability to function properly depends critically on both local and systemic patient-related factors. The patient's overall health directly affects how quickly the dental implant recovers.One of the systemic elements that is often disregarded is the patient's vitamin D level, which influences the formation of bone surrounding the implant and the subsequent process of osseointegration[1]. The majority of the multifunctional hormone vitamin D is created in the skin after being exposed to ultraviolet (UV) B radiation from sunshine.

Merely a little portion originates from external sources, such as foods and supplements. By regulating the metabolism of calcium and phosphate, it facilitates growth, causes the necessary remodelling of the teeth and bones, and coordinates physiological functions. The 25 (OH) D level, which has a half-life of two to three weeks and indicates both endogenous production and vitamin D intake, should be taken into account when determining the person's vitamin D level[2]. Numerous investigations have been carried out to define vitamin D deficiency and establish the typical range of 25 (OH) D levels. These studies indicate that there are three different levels of vitamin D: sufficient if desired is higher than 30 ng/mL (recommended range is 40 - 60 ng/mL) and higher than 150 ng/mL; vitamin D deficiency if 25 (OH) D is less than 20 ng/mL; and vitamin D insufficiency between 21 and 29 ng/Ml[3]. The 1,25 (OH)2D3/Vitamin D Receptor (VDR) pathway may have a direct or indirect impact on bone remodelling through facilitating the differentiation and maturation of osteoblasts and osteoclastsType I increases the expression of osteogenic genes, such as those encoding collagen, alkaline phosphatase, osteocalcin, and osteopontin, and speeds up the production of new bone in osteoblasts through the 1,25(OH)2D3/VDR pathway. Furthermore, in the presence of exogenous etiological factors, VDR polymorphism has been demonstrated to be linked to an increased risk of chronic periodontitis and other inflammatory disorders[4].

IMPORTANCE OF VITAMIN D IN JAWS

Among the four tissues that comprise the periodontium is the alveolar bone. As a result, it is intimately linked to periodontal disease and osteoporosis. Low levels of calcium and vitamin D cause the loss of bone structure, disturbance of bone mineralization, and a negative calcium balance. Insufficient amounts of vitamin D lead to rickets in children, osteoporosis in adults, and a higher chance of bone fractures[5]. Before undergoing mandibular procedures, patients at risk for vitamin D insufficiency should be examined and given vitamin D supplements if their serum levels are low. This recommendation was made by Syed et al[6]. Improved periodontal health can be achieved by taking more calcium and vitamin D, increasing the mandibular bone mineral density, and reducing alveolar bone resorption. People with low BMD may have a systemic increase in cytokines that alter bone resorption throughout the skeleton, including the jawbone. This data suggests that vitamin D, with its effects on bone and anti-inflammatory properties, may be helpful in the treatment of periodontitis[7].

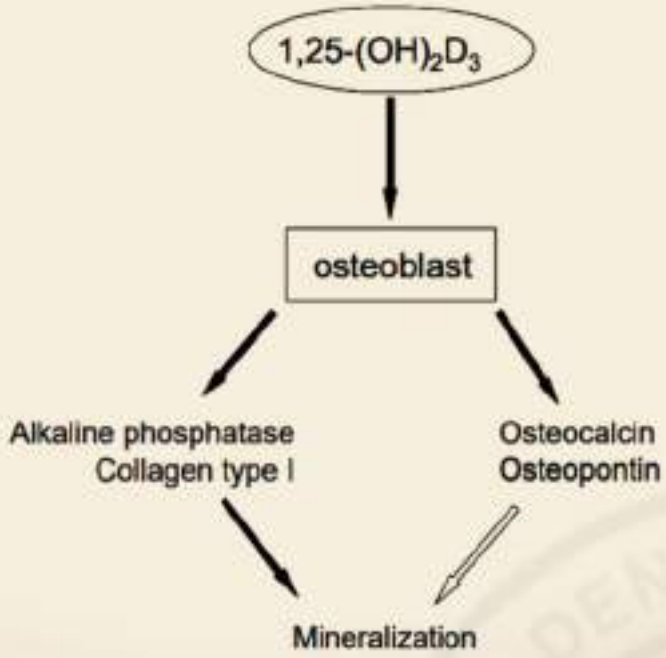

FIG 1: Vitamin D Effects on Osteoblast Function and Mineralization[8].

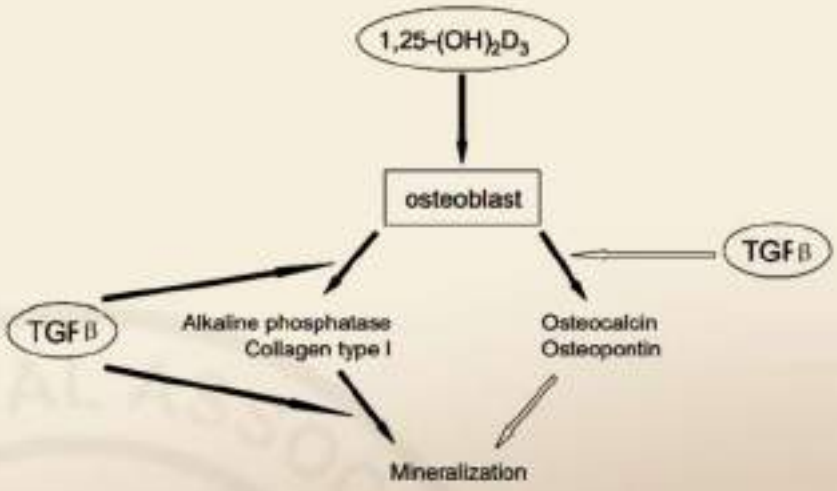

FIG 2 : Vitamin D and TGFb Interaction on Osteoblasts Function and Mineralization[8].

ROLE OF VITAMIN D ON IMPLANTS

Finding out how vitamin D affects immune system and bone metabolism is of utmost importance to maxillofacial surgeons and implantologists. Sufficient levels of vitamin D may be necessary for endosseous implants to successfully integrate at each stage. It is crucial to have enough amounts of vitamin D3 starting on the day of surgery. By reducing the synthesis of cytokines that promote inflammation and increasing the production of cathelicidin and defensin, it alters how the immune system functions. By encouraging the growth of osteoblasts and osteoclasts and forcing the bone surrounding the implant to continue changing even after the prosthetic replacement has been placed, it also has a good influence on bone metabolism in cases of osteosuppression[9]. A sufficient concentration of vitamin D is preferred during the implant's osteointegration phase due to the intense resorption and osteogenesis processes.

Successful dental implant therapy is mostly dependent on osseointegration, which is obtained by functional ankylosis. Together, the foreign substance and the living bone develop to form a functional unit. This is called the first contact between the newly formed bone and the implant. Vitamin D has the ability to either accelerate or slow down the formation of new bone, depending on its level. Many illnesses, including periodontitis, early tooth loss, a degradative metabolism, osteoporotic fractures, and delayed fracture healing, have been related to vitamin D deficiency[10].

The essential requirement for osseointegration and, thus, implant success is adequate osseous healing. Dental implantology primarily aims to provide long-lasting stable implants, and osseointegration is recognised to be reliant on several parameters for implant survival. The use of tobacco, diabetes, bone preparation, and local bone necrosis brought on by heat generation during implant insertion are all factors now being researched to explain the cause of implant failure. Failures are major issues that may have an impact on the patient's overall health, particularly when they arise from a lack of osseointegration. It has been demonstrated that failure rates can be decreased and predictability can be raised by the identification of systemic risk factors. Low blood levels of vitamin D may have a negative impact on healing processes and the production of new bone on the implant surface, as osseointegration of dental implants is also dependent on bone metabolism[11].

The impact of vitamin D deficiency on implant survival during the early stages of recovery has been brought up in recent case studies. As is well recognised, a healthy bone metabolism is essential to the effectiveness of bone regeneration techniques used in implant osseointegration[12]. It is well known that vitamin D stimulates the production of extracellular matrix protein for bone formation by osteoblasts, as well as providing osteoclast activity and raising levels of osteocalcin, osteopontin, calbindin, and 24 hydroxylase in bone metabolism.[11] The osseoimmunology that underpins bone production is supported by vitamin D, and this helps implants mend more quickly. But a prerequisite for the findings to be presented is that vitamin D monitoring in implantology could not be carried out on a regular basis. Once more, there is uncertainty around the link between low vitamin D and early implant loss.

Satué et al. assessed the biological effects of titanium implants coated with UV-activated 7-dehydrocholesterol (7-DHC), a precursor to vitamin D3, on osteoblast development and cytotoxicity in an experimental investigation. Based on these findings, titanium implants coated with 7-DHC exhibited favourable impacts on osteoblast development and proliferation in contrast to control implants (implants devoid of 7-DHC coating) [13]. Surprisingly, Naito et al.'s findings revealed no discernible variation in the amount of new bone formed around implants with and without vitamin D3 coatings. It has been demonstrated that the surfaces of vitamin D-coated and untreated implants are rough, which provides an explanation in this context[14]. The impact of vitamin D supplementation on the osseointegration of implants is still debatable and needs more research, as it is still uncertain whether vitamin D-coated dental implants have an osseointegration effect in vivo[15].

In their investigation, Cho et al. implanted vitamin D-coated devices onto rabbits' tibia; at 4 and 12 weeks, the degree of osseointegration was assessed. The study's findings showed that the coating with 1,25(OH)2D3/PLGA solution produced submicron-sized particles that might stimulate the growth of new bone next to the surface of implants inserted into bone[16].

CONCLUSION

The various stages of implants and their fusion with bones are impacted by vitamin D. In order to achieve the best results, it is advised to measure the levels of vitamin D prior to implant surgery because of its significance in the metabolism of bone tissue and the immune system. This has made vitamin D a major area of research in dental surgery and implantology. Nonetheless, more investigation is necessary to produce recommendations and management plans for implant patients with low vitamin D levels[16,17]. Dental professionals are becoming more and more conscious of how important it is to maintain the ideal level of vitamin D in order to maintain disease-free oral health. Despite the fact that vitamin D and implant success are expected to have a close relationship because of its strong correlation with bone metabolism, a large number of experimental studies and a small number of clinical studies unfortunately produced contradictory results.

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merging the two schemes

SSS Social Security Scheme **PPS** Professional Protection Scheme

MEMBERSHIP STRENGTH

3750+ MEMBERS

PRESENTLY IDA HOPE PROVIDES

Social Security (Death / Total Permanent Disability)
> 15 Lakhs for the dependents

Professional protection
compensations up to Rs. 4 Lakhs
(with co-pay of 25% for 2 lakhs)

HOPE ASSURE

- **Extended Professional Indemnity cover of Rs. 25 Lakhs to 2 crores.**
- **Clinic & Residence Insurance against natural calamities-Fire, Floods, Burglary, Theft, Vandalish etc.**
- **Add on policy for Neon Signage & Plate Glass.**
- **New Public liability cover**

RENEWAL - JULY 10

HOPE LEGAL CELL (PROFESSIONAL PROTECTION)

LEGAL AID to the members for cases that may arise during the course of their professional practice.

The coverage for the new members starts **one month** after the acceptance of the complete documents including membership fee by the Hon. Secretary.

Takes up Dento - Legal cases of HOPE members from the first stage itself - Lawyer's Notice.

Engages and gets advice and support of Advocate Pays Advocate's / Legal fee and other expenses.

Fights out the case in Forum / Court Pays the compensation amount, if awarded

For Legal Assistance Contact **Dr. Satheesh K Joseph**. Vice Chairman-Legal Cell **Mob 9447141008**

SOCIAL SECURITY

- Supporting the family in the event of **Death / Total Permanent Disability** of a member.
- The contribution to the family **(Fraternity Contribution)** is collected from the members of the scheme @ **Rs. 500** per claim in a year.
- The coverage for the new members Starts **one year** after the acceptance of the complete documents including membership fee by the Hon. Secretary.

Dr. Anwar M Ali Vice Chairman- Social Security **Mob: 9446354333**

JOURNAL GUIDELINES

Manuscript type : accepted are i) research ii) case report iii) review iv) short study
Article should be typed in times new roman size 12 A4 size paper. Use 1.5 spacing through out with a significant margin. Authors are advised to retain a soft copy for the reference and a soft copy of the article has to be sent to the editors email
Ethical consideration: manuscript submitted for publication must comply with the following ethical consideration. Written informed consent must be obtained from the subject before their data included in the study. Any data from the patient must be submitted by hiding their identity. All research should be carried out with prior approval from institutional or national ethic committee and should be in accordance with Helsinki declaration of 1964. If animals are used for research, the authors must follow the institutional or national guidelines for the care of use of laboratory animals
Manuscript format
Title : The title of the article should be concise, specific & informative
Authors : Name of the author with his/ her highest academic degree and institutional affiliation. Name address phone number and email address of the author and corresponding authors should be mentioned.The maximum number of authors for article is five.
Abstract : the abstract should not exceed 200 words. Below the abstract 3 to 10 key words in alphabetical order should be given. Abstract should contain the purpose of the study, materials and method, statistical analysis, results and conclusion.
Manuscript: For all the manuscript the word limit would be up to 3500 words excluding the references and abstract.
Tables should be self-explanatory, numbered in roman numbers, according to the order mentioned in the text.
Illustrations should be clearly numbered, each figure should be referred to the text, high quality digital images must be submitted in JPEG format.
Reference : References must be included and the bibliography should follow the vancouver format. The referencing should be numbered sequentially as superscripts in order of their appearance.
Copy right: while submitting the manuscript the authors has to make sure that the article submitted has not been published before .
All communications should be addressed to the Editor and addressed to:

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