



International Healthcare Research Journal (IHRJ)

E - I S S N : 2 4 5 6 - 8 0 9 0

Volume 6, Issue 7



EDITORIAL TEAM

Patron

Dr. C.V. Ananthakrishnan, MD (Orthopaedics), Senior Joint Replacement Surgeon, Ex-Clinical Associate Professor (Dept. of Orthopaedic Surgery), Texas Tech University, School of Medicine, Lubbock, Texas, USA, Ex-Medical Director, St. Mary of the Plains Hospital Texas, USA.

Editor-In-Chief

Dr. Vatsul Sharma, MDS, Consultant Dental Specialist, Ex-Senior Lecturer, Sri Sukhmani Dental College, Dera Bassi (SAS Nagar) 140507, Punjab India.

Co-Editor

Dr. Sahil Thakar, MDS, Assistant Professor, Department of Public Health Dentistry, School of Dental Sciences, Sharda University, Greater Noida, India.

Editorial Coordinator (North America)

Dr. Arushi Khurana (MBBS, MD, Advanced Hematology Fellow, Lymphoma), Mayo Clinic, Rochester, Virginia, USA.

Editorial Coordinator (South America)

Dr. Antonio Vaz de Macedo (Clinical Hematologist, MD), Head, Haematology Clinic, Hospital da Polícia Militar; Part of the Hematopoietic Stem Cell Transplantation (HSCT) team at Hospital Luxemburgo, Belo Horizonte, Brazil.

Editorial Coordinator (Australia)

Dr. Ishita Sood, Master of Physiotherapy in Musculoskeletal Disorders, Member, Indian Association of Physiotherapy & Australian Association of Physiotherapy, The Physio Co. , Melbourne, Victoria, Australia.

Editorial Coordinator (Europe)

Dr. Vjollca Ramiqi, Psychiatrist in Unit of Addiction Disease, Public Clinique of Psychiatry of Pristina, Pristina, Republic of Kosovo.

Editorial Coordinator (Asia & Africa)

Parul Chawla, Masters in Systems Biology and Bioinformatics, System Biologist, Bioinformatician, Biostatistician, Pharmacovigilance Professional, India.

Associate Coordinator

Dr. Jayant Kumar Sah, MBBS, MS, M.Ch (Surgical Gastroenterology), Fellowship in Advanced Liver Transplant, Department of Surgery, Institute of Medicine, Tribhuvan University Teaching Hospital, Nepal.

Associate Editor(s)

Dr. Puthuvadathayil Mohamed Shamsuddeen, [MBBS; MRCP(UK); FRCP (Edin)], Consultant Physician, Al Bustan Hospital, Musaffah, Abu Dhabi, UAE.

Dr. Ravneet Malhi, MDS, DJ College of Dental Sciences and Research, Modinagar, India.

Forensic Editor & Advisor

Dr. Taruna Malhotra, M.Sc. (Forensic Odontology), Consultant Dental Surgeon, New Delhi, India.

EDITORIAL TEAM

Technical Advisor

Dr. Manish Sharma, Ph.D, Associate Professor, Department of Physics, School of Basic Sciences and Research, Sharda University, India.

Section Editor

Dr. Sulabh Puri, MD [MBBS, MD (Radiodiagnosis)], Senior Resident, Department of Radiodiagnosis, All India Institute of Medical Sciences, New Delhi, India.

Editorial Board

Dr. Richard J. Gray, (DDS, Endodontics), Private Practitioner & Ex-Assistant Professor, Virginia Commonwealth University, School of Dentistry, USA.

Dr. Anil Sharma, [MBBS, MS(General Surgery)], Private Practitioner, Ex-Registrar, Ram Manohar Lohia Hospital, New Delhi, Ex-Medical Officer Incharge (HCMS), India.

Dr. Girish Joseph, [MBBS, M.D. (Pharmacology)], Drug Safety Physician, APCER, Delhi, India.

Dr. Naimatullah Habibi, [B.Sc. (General Medicine), MD (Doctor of Medicine), MD (Family Medicine)], General Practitioner, Melbourne, Victoria, Australia.

Dr. PACKO Dieu-le-veut saint-cyr Sylvestre, MBBS [Specialty career in Hématology (DES): Diploma of Specialized Study in Hematology, University of Félix Houphouët Boigny (Abidjan)], Hematologist and Urgentist Doctor, Assistant Professor, Institute of Medicine of University of Bangui, Hospital Teacher and Searcher of Hematology Department of University Hospital of Yopougon, Côte d'Ivoire.

Dr. Kuljit Singh Uppal, [MBBS, DLO, MS(ENT)], Ex-Associate Professor, Government Medical College and Hospital (GMCH), Patiala, India.

Dr Mayank Gahlot, MDS, Specialist Orthodontist, Al Attar Center, Karama, Dubai.

Dr. Syed Ameer Haider Jafri, MDS, Registrar, King Salman Armed Force Hospital, Tabuk, Saudi Arabia.

Dr. Bhuvandeep Gupta, MDS, Professor, Department of Public Health Dentistry, ITS Dental College, Hospital and Research Centre, Greater Noida, India.

Dr. Gyanendra Mishra, MDS, Medical Officer Dental, Ministry of Health, Jharkhand, India.

Dr. Vivek Vijay Gupta, MDS, Senior Lecturer, Faculty of Dentistry, SEGi University, Jalan Teknologi 9, PJU5, Kota Damansara, Petling Jaya-47810, Malaysia.

Dr. Ramya Madhuri, MDS, Solumaniah, Riyadh, Saudi Arabia.

Dr. Sheetal Grover, MDS, Reader, Seema Dental College and Hospital, Rishikesh, India.

Dr. Sakshi Kataria, MDS, Senior Lecturer, Sudha Rustagi College of Dental Sciences and Research, Faridabad, Haryana, India.

Name of Publisher & Publication Address

Dr. Vatsul Sharma, 66 A, Day Care Centre, Housing Board Colony, Kalka (Panchkula), Haryana, India-133302.

QR CODE



Osteoporosis and Its Impact on Oral and Dental Health

MANISHA SINGH^{*1}, HEMANT SAWHNEY², RICHA MISHRA¹, JAYANT KUMAR¹

INTRODUCTION

Osteoporosis is defined as a metabolic bone disorder characterized by low bone mass, and micro-architectural degradation of bone tissue leading to enhanced bone fragility and a consequent increase in fracture risk.¹ Females with an age above 50 years and males with an age above 65 years are commonly affected.² The risk factors for osteoporosis include older age groups involving both genders, and predilection for females with estrogen deficiency after menopause.³ Decrease in bone mineral density noted with advanced age and females with estrogen deficiency after menopause. Other risk factors for osteoporosis include hyperparathyroidism, glucocorticoid therapy, smoking, hyperthyroidism, and malabsorption which may result in decreased bone mass and decreased bone mineral density.

The bones of Osteoporosis patients are weak and tend to get fractured easily. The diagnosis and treatment plan for this disease is important to avoid complications of Osteoporosis. Patients with Osteoporosis will not have pain and remain undetected until they experience a fracture. World Osteoporosis Day is celebrated on 20th October every year to create awareness among people about this metabolic bone disease. This awareness is required for the prevention, diagnosis, and treatment of Osteoporosis. People should be educated about the measures to improve and maintain bone health of bone to prevent fractures.

The confirmative diagnosis of Osteoporosis is by dual-energy X-ray absorptiometry (DXA) scanners to assess bone mineral density. The two disadvantages of this scanner include its availability and high cost due to which this disease gets undiagnosed. The progressed stage of this disease may result in fractures of bone affecting the quality of life of patients. Dental radiographs play an important role in diagnosing Osteoporosis. Early screening and diagnosing osteoporosis can be done by digital panoramic

radiography. Using digital panoramic radiography, the quantitative and qualitative indices can be evaluated to assess the quality of bone in osteoporosis patients.

The quantitative and qualitative indices include mental index (MI), panoramic mandibular index (PMI), antegonial index (AI), mandibular cortical thickness (MCT), and mandibular cortical index (MCI).^(4,5) Digital panoramic radiography is indicated for maxillofacial structures and early bony cortical changes due to Osteoporosis can be recorded which will be helpful in preventing fractures. The main advantages of digital panoramic radiography are it is less costly and easy to interpret. Early changes in the bony cortex in patients with Osteoporosis can be detected using digital panoramic radiography and for further confirmation, necessary investigations using dual-energy X-ray absorptiometry (DEXA) should be advised.

Osteoporotic fractures of the spine and vertebrae are common. The treatment of fractures by orthopedic means with analgesia. The patient is advised to bed rest over a period of 2-3 weeks, muscle relaxants, and followed physiotherapy to improve mobilization. Osteoporosis can result in the alteration of bony cortical changes and so these patients may predispose to periodontal diseases. Other oral findings include alveolar bone ridge resorption, referred pain to the maxillary sinus, and bone loss. These patients should follow up with dentists for the evaluation of periodontal tissues and proper maintenance should be done to decrease bone loss and hence prevent tooth loss.

The measures which can decrease osteoporosis are lifestyle modifications including daily routine exercises and proper nutrition and reducing smoking and alcohol. Maintaining skeletal strength and decreasing skeletal trauma which decreases osteoporosis. Calcium and vitamin D can add to the supplementation of



©Manisha Singh et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 26-Oct-2022; Accepted on: 29-Oct-2022

adults which can decrease bone loss. Medications that increase bone mineral density include bisphosphonates (BPs), selective estrogen receptor modulators, calcitonin, hormone replacement therapy, and recombinant human parathyroid hormone.⁶ These medications can be helpful in the treatment of osteoporosis.

CONCLUSION

Early detection of Osteoporosis due to Digital panoramic radiography will help in decreasing fractures and tooth loss. Necessary measures include lifestyle modifications, anti-resorptive agents, and calcium and vitamin supplementation should be taken to prevent and decrease osteoporosis. Digital panoramic radiography detects the bony cortical changes and erosion which can be useful in screening for Osteoporosis. The campaign should be organized to create awareness among the public about the risk factors of Osteoporosis and its prevention. The public should be educated about decreasing the habit of smoking and proper nutrition should be taken to maintain bone health.

REFERENCES

1. Consensus development conference. Prophylaxis and treatment of osteoporosis. Am J Med. 1991; 90:107-10
2. Shetty S, Kapoor N, Naik D, Asha HS, Prabu S, Thomas N, et al. Osteoporosis in healthy South Indian males and the influence of lifestyle factors and Vitamin d status on bone mineral density. J Osteoporos 2014; 2014:723238
3. Vijay G, Chitroda PK, Katti G, Shahbaz S, Baba I, Bhuvaneshwari. Prediction of osteoporosis using dental radiographs and age in females. J Mid-life Health 2015; 6:70-5
4. Watanabe PC. Morphological study of the Mandibular trabecular bone in panoramic radiographs. Int J Morphol 2007; 25:875-80.
5. Taguchi A, Tsuda M, Ohtsuka M, Kodama I, Sanada M, Nakamoto T, et al. Use of dental panoramic radiography in identifying younger postmenopausal women with osteoporosis. Osteoporos Int 2006; 17:387-94.
6. Poole K, Compston J. Osteoporosis and its management. Br Med J 2006; 333:1251.

Source of support: Nil, **Conflict of interest:** None declared

Cite this article as:

Singh M, Sawhney H, Mishra R, Kumar J. Osteoporosis and Its Impact on Oral and Dental Health. Int Healthc Res J. 2022;6(7):SC1-SC2. doi: <https://doi.org/10.26440/IHRJ/0607.10569>

AUTHOR AFFILIATIONS (*: Corresponding Author):

1. Assistant Professor, Department of Oral Medicine and Radiology, School of Dental Sciences, Sharda University, Greater Noida, Uttar Pradesh, India
2. Professor and Head, Department of Oral Medicine and Radiology, School of Dental Sciences, Sharda University, Greater Noida, Uttar Pradesh, India

Corresponding Author & Address

Dr. Manisha Singh
Assistant Professor
Department of Oral Medicine and Radiology
School of Dental Sciences
Sharda University
Greater Noida, Uttar Pradesh, India

Contact e-mail for corresponding author: manishasingh1831988[at]gmail[dot]com



Emporiatics: A Comprehensive Guide to Travel Safely

JAISMIN SINGH ¹, PALAK CHAUDHARY ²

A
B
S
T
R
A
C
T

The journey overseas has its manifold benefits resulting in its increased trend these days. People are more aware of its positive impact on mental and physical wellness, but they are less aware of the risks and issues that it poses. International travel is becoming more popular as it promotes physical and mental well being while also providing job and educational opportunities. With this boost in international travel, it is critical to ensure traveller's safety. Tourists are susceptible to a wide range of travel-related health issues, from insect bites to injuries in extreme sports or due to extreme climate. Children, elderly, and people with underlying diseases should take extra care and precautions. Emporiatics, also known as travel medicine is a multidisciplinary speciality that promotes health and provides prevention and management of health problems encountered by international travellers, with a primary emphasis on preventive pre-travel care. It suggests the need to consult health care professional beforehand and if required referral to travel medicine specialist. Therefore, it is necessary to raise awareness about this issue for the well being and safety of the tourists.

KEYWORDS: Travel medicine, Travellers health, Vaccines, Travel kit, Travel medicine specialist

INTRODUCTION

Emporiatics is derived from greek word “emporos”: One who goes on shipboard as a passenger and “iatrike”: medicine. It is the study of diseases in travellers.¹

Travel medicine is the field of medicine that deals with promotion of health, prevention of diseases and management of health problems of international travellers. It's first approach is pre-travel preventive care.

Travel medicine is a rapidly evolving, highly dynamic, multidisciplinary specialty that requires expertise on various travel-related illnesses, as well as up-to-date knowledge on the global epidemiology of infectious and noninfectious health risks, health regulations and immunisation requirements in various countries, and the changing patterns of drug-resistant infections.

WHY IT IS IMPORTANT?²

A. Risk of diseases in the country:

1. **Japanese encephalitis:** In parts of eastern and southeastern Australia.
2. **Global Polio:** Circulating poliovirus in Afghanistan, United Kingdom, Egypt, Israel, Nigeria, Pakistan, Uganda, Ukraine etc.
3. **Dengue:** Risk in many parts of Asia and the Pacific Islands like Afghanistan, Bangladesh, India, Laos, Malaysia, Myanmar (Burma), Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Vietnam.

B. Contaminated food and water:

1. Contaminated water can cause diarrhoea, vomiting, or infection of the ears, eyes, skin, or the respiratory or nervous system.
2. Contaminated (raw/ undercooked) food can cause food poisoning.

C. Environmental risks:

1. Climate change: Extreme temperatures, uv radiations, changed humidity and changed altitudes can cause frostbite, hypothermia, sun burn, dermatitis, heat stroke, respiratory distress, altitude sickness and thromboembolism respectively.
2. Changed time zone (circadian rhythm) can cause jet lag.
3. Air travel can cause motion sickness and barotrauma.
4. Air pollution and animals and insects exposure can cause respiratory problems or failure and insect-borne diseases, bites/ stings respectively.

D. High Risk Travellers

1. Immunocompromised patients
2. Pregnant or breastfeeding women
3. Extreme age groups like young children and elderly.
4. Pre-existing medical conditions or chronic illnesses (eg, diabetes mellitus, chronic cardiac or pulmonary conditions, renal disease, psychiatric illness, cancer, epilepsy, etc).
5. History of anaphylaxis to medications, foods, or insect bites
6. VFRs (travellers that have migrated from a



© Jasmine Singh et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 06-Jun-2022; Accepted on: 04-Oct-2022

developing country to an industrialised region, and who are now returning to their country of birth). Compared with other groups of international travellers, VFRs (particularly children) experience a higher incidence of travel-related infectious diseases.

E. Falls/accidents

Road side accidents, drowning, air crashes, injuries involved in extreme sports. Accidents are the second most common cause of death in travellers (after cardiovascular disease), accounting for as many as one-third of deaths.

6. Extreme Sports:

1. White-water rafting: Increased risk of leptospirosis specially after heavy rainfall or flooding.
2. Spelunking: Cavers are at an increased risk of rabies and histoplasmosis.
3. Swimming in fresh water: Schistosomiasis (parasitic infection) is prevalent in tropical and subtropical areas (Africa).
4. Trekking and Hiking: Risk of altitude illness in destinations which are >2500 to 3500 m above sea level (e.g. Peru; La Paz, Bolivia; Lhasa, Tibet; Everest base camp in Nepal) which, if not appropriately managed, can progress to ataxia, coma, and even death.

HOW DENTISTRY CONTRIBUTES?

1. Dental Emergency:
 - a). Barodontalgia:³ It is defined as tooth pain occurring in changes in ambient pressure. E.g. Flying and diving. It occurs in travellers with new or recurrent caries, pulpitis after restorative treatment, intra-treatment endodontic symptoms, dental and periodontal cysts, or abscesses.
 - b). Dental trauma: Pain due to cracked or chipped tooth (tooth fractures), knocked out tooth (avulsion), injury to gums, palate or mouth through trauma or impact. These injuries can occur due to random falls, injuries in extreme sports, biting hard foods, violence etc.
 - c). Dislodged or broken restoration: Damaged fillings and loose prosthesis if causing pain, discomfort and difficulty in function.
 - d). Previous untreated dental problems: Untreated dental caries, pulpitis, grossly decayed tooth, pericoronitis. These problems can cause discomfort, difficulty in eating, sudden excruciating pain or dull pain which is long lasting and can even progress to infection and swelling.

2. Dental kit: toothpaste, dry toothbrush with cap to avoid contamination, dental floss, mouth wash, dental pain killers such as acetaminophen or ibuprofen, sugarless gum for chewing after meals to increase saliva flow to help remove food particles and sugar from your mouth, dental appliances if used daily such as retainer, headgear, night guard, mouth guard, or dentures must be packed along with case.

3. Food and beverages: Eat mindfully, after having sugary drink or desert make sure to rinse your mouth and brush afterwards. Do not chew on hard foods like ice, candies to prevent any kind of dental trauma. Make sure you brush twice everyday along with flossing and mouthwash.

4. Pre-travel dental appointment: WHO recommends that you pay us a visit every 6 months for a dental exam and cleaning. Make sure all your emergency treatments are done along with scaling and restorations. Dentist will examine and look for cavities, tooth decay, gum disease and other potential problems like loose fillings or crowns. Dental problems should be addressed before leaving to avoid potential problems in abroad.

HOW TO DEAL?

A. Pre-Travel:

1. Visit your Primary care doctor or a travel medicine specialist and your dentist. According to the World Health Organisation, people who plan to travel need to contact a physician specialised in travel medicine, at least 4-6 weeks prior to departure.
2. Get your check ups and treatments done before leaving including the dental treatments and scaling.
3. Get your routine, required and recommended vaccines: Check the list of routine vaccines on CDC website and select your destination for recommended vaccines and consult your doctor before getting one.
4. Pack smart list: According to CDC: Prescription medicines, Medical supplies, Over-the-counter medicines, Supplies to prevent illness or injury, First-aid kit and Documents. Dental kit should also be packed.
5. Travel Insurance: Check for medical and dental care coverage.

B. During Travel:

1. Food and water: Avoid tap water, raw foods, unpasteurised dairy, undercooked meat/ fish. Seek restaurants with excellent reputation and safety.
2. Vector-borne illnesses: Avoid outdoor exposure between dusk and dawn (vector feeding times) for

malaria, use insecticide treated bedding and clothing, use insect repellents.

3. High risk activities: Avoid freshwater exposure where schistosomiasis is prevalent, approaching, avoid approaching animals, at high altitudes: Acclimatise, ascend gradually, avoid over exertion.

4. Maintain your oral hygiene: Practice brushing, flossing, tongue cleaning daily with mouth rinses.

C. Post- Travel:

1. Symptomatic Travellers returning with symptoms like fever, diarrhoea with blood, altered mental status, severe abdominal pain, jaundice or rash should seek prompt medical care and mention their travel history.

2. Complete the course of malaria tablets if taking as recommended.

3. Get yourself tested for itinerary specific or country specific diseases e.g. contact with fresh water rivers and lakes in the tropics (for example for swimming) should get schistosomiasis screening tests done, if the disease is considered to be present in the country and those developing symptoms of COVID-19 should follow current public health guidelines.

CONCLUSION

With the growing trend of travelling abroad for vacations or education, travel medicine has become a significant topic to explore, particularly in the post covid era. Increased international travel and development of tourism industry make travellers more vulnerable to various health risks and travel related sickness. There is lack of awareness among people regarding all kinds of health problems that may arise during their journey overseas, therefore it is necessary for travellers to consult a health care professional beforehand and seek pre travel health advice. This will assist them in taking all necessary precautions and pack all the essentials to ensure good health and safety

during and post travel especially for the high risk individuals.

REFERENCES

1. Shulman JA, Morrison A JR. The Traveling Patient. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 227. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK338/> [Last Accessed on 23rd May, 2022]
2. Oberoi SS. Emporiatrics: The growing area of concern. J Res Med Sci. 2014;19(9):799-800.
3. Stoetzer M, Kuehlhorn C, Ruecker M, Ziebolz D, Gellrich NC, von See C. Pathophysiology of barodontalgia: a case report and review of the literature. Case Rep Dent. 2012;2012:453415. <https://doi.org/10.1155/2012/453415>

Cite this article as:

Singh J, Chaudhary P. Emporiatrics: A Comprehensive Guide to Travel Safely. Int Healthc Res J. 2022;6(7):RV1-RV3. <https://doi.org/10.26440/IHRJ/0607.10564>

AUTHOR AFFILIATIONS: (*Corresponding Author)

1. Interns, Himachal Dental College, Sundernagar, Himachal Pradesh, India (<https://orcid.org/0000-0001-9275-7892>, Jasmine Singh, <https://orcid.org/0000-0002-2242-1071>, Palak Chaudhary)

Source of support: Nil, Conflict of interest: None declared

Contact Corresponding Author at: [singhjaismine91\[at\]gmail\[dot\]com](mailto:singhjaismine91[at]gmail[dot]com)



Artificial Skin: A Review

RUMEET KAUR^{*1} , CHAHAT KAUSHAL²

A
B
S
T
R
A
C
T

The skin is a multifunctional organ that is protective, self healing and sensing and many forms of artificial skin have also been developed, having properties and functionalities approximating to natural skin. Artificial skin can be formed by biological substances as well as non-biological substances. This article maps out the structural difference between natural and artificial skin, the need for formation of artificial skin which is very useful for treating patients with burn injuries and various other skin conditions.

KEYWORDS: Artificial Skin, Epidermis, Collagen

INTRODUCTION

The outermost epidermis and the deeper dermis make up the majority of the intricately layered structure of the skin, the biggest organ in the human body. The skin also contains different appendages including hair follicles, sweat glands, sebaceous glands, nerves, lymphatics, and blood arteries, as well as a subcutaneous hypodermis layer that stores adipose tissue. These numerous skin constituents, which perform vital protection, thermoregulation, excretion, absorption, metabolic processes, sensory, evaporation control, and aesthetic activities, ensure existence.

Artificial skin is a synthetic version of human skin created in a lab and is frequently applied to heal massive burns.

METHODS

Standard monolayer (2D) cell cultures do not accurately reproduce the physiological architecture of the skin because the cells that make up human skin tissue grow inside an ordered three dimensional (3D) matrix that is always surrounded by surrounding cells. It has now been accomplished to reconstruct in vitro a variety of human skin recombinants, also known as artificial skin, which offer this crucial 3-D structure. This review considers alternatives to animal testing as well as other uses for these organotypic skin models.¹

Artificial skin is a collagen scaffold that induces regeneration of skin in mammals such as humans. The term was used in the late 1970s and early 1980s to describe a new treatment for massive burns.

USES OF ARTIFICIAL SKIN

1. Burn injuries: They are frequently treated with artificial skin, particularly when the patient doesn't have enough good skin to cover the wound.²

Such injuries may become fatal due to considerable fluid loss and infection since the body cannot produce skin cells quickly enough to repair the injured skin. Thus, using artificial skin to heal the incision right away will increase survivability.

2. Skin conditions: Apligraf, a product made of artificial skin, has been used to treat open lesions on the skin that heal slowly and chronically, such as ulcers. Additionally, they can be used to treat skin conditions like eczema and psoriasis, which frequently impact a big region of the body and may benefit from artificial skins that are loaded with medication and are simple to wrap around the affected area.³

3. For research: Apart from its applications in the clinical context, artificial skin may also be used to simulate human skin for research in consumer goods and medicine. Animal testing, which is frequently utilised to determine how a cosmetics or medical product may impact the skin, is one example of how fake skin is employed as an alternative.

However, this testing could be painful and uncomfortable for the animals and is not always a good indicator of how human skin will react. Many chemical compounds and products have already been tested on



© Rumeet Kaur et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 12-Jul-2022; Accepted on: 17-Oct-2022

artificial skin by some businesses.

4. Study purposes: Artificial skin may also serve as a model for human skin in other types of study, such as studies on the effects of UV radiation on skin and the passage of chemicals in cosmetics and pharmaceuticals through skin.

TYPES OF ARTIFICIAL SKIN

Artificial skin substitutes can imitate either the epidermis or the dermis, or both in a "full-thickness" skin replacement.

Some items are made from biodegradable substances that are not found in the human body or biological substances like collagen. Another component of these skins may be made of non-biological materials, such as Integra's silicone epidermis.⁴

Additionally, sheets of skin grown from the patient's or another person's live skin cells have been used to create artificial skins.

The foreskins of babies collected following circumcision are a significant source. Such cells are frequently immune system-suppressive, which makes them considerably less likely to be rejected by the patient's body and enables foetuses to develop in their mothers' wombs without being rejected.⁵

HOW SKIN GRAFTS DIFFER FROM ARTIFICIAL SKIN?

It is important to distinguish artificial skin from skin grafts.

Skin grafts involve removing healthy skin from a donor and attaching it to a wound. The patient would want to be the donor, but it might also come from other people, including cadavers, or from animals, such as pigs.

Whereas artificial skin is made in a laboratory. The extracted fibroblasts are added to collagen which is a fibrous protein found in connective tissue.⁶

When the compound is heated, the collagen gels and then it traps the fibroblasts, which in turn arrange themselves around the collagen, becoming compact, dense, and fibrous. After several weeks, the keratinocytes which are extracted from the donated foreskins, are seeded onto the new dermal tissue, where they create an epidermal layer.

FUTURE ARTIFICIAL SKIN IMPROVEMENTS

Even though artificial skin has helped a lot of individuals, there are still issues that can be fixed.

For instance, the cost of artificial skin is high since it requires a labor-intensive and complicated manufacturing process. Additionally, artificial skin—such as sheets made from skin cells—can potentially be more brittle than actual skin.

But the developed skins will continue to save lives as long as researchers work to improve these and other factors.

THE NEED FOR ARTIFICIAL SKIN

When the skin has been seriously damaged through disease or burns, the body cannot act fast enough to manufacture the necessary replacement cells. This lead to the development of Skin Grafts.

Skin grafts can be obtained from patient's own donor site, another person, cadaver skin or from other species such as pig.

But skin grafts have some disadvantages. Infections or in cases of cadaver skin, rejection were primary concerns. Cadaver skin can provide protection and loss of fluids during a burn victim's initial healing period, but a subsequent graft of patient's own skin is often required which restricts the physician to what skin the patient has available.⁷

So, In the mid-1980s, several medical researchers joined forces to develop tissue engineering to reduce the incidences of infection and rejection. This lead to the formation of Artificial Skin.⁸

An artificial skin graft has several advantages over those derived from the patients, cadavers or other species. It eliminates the need for tissue typing.⁹

CONCLUSION

The ideal artificial skin should be screened for pathogens, severely curtailing to the chance of infection. The artificial skin is not rejected by the patient's body as it does not contain any immunogenic cells such as dendritic cells and capillary endothelial cells. Nevertheless, recent rapid progress in the field of engineering of biomaterials and tissue engineering offers hope for the development of new technology, allowing for fast, personalized, and cost-effective production of functional cell-based artificial skin

substitutes which will treat several patients with burn injuries or other skin diseases.

REFERENCES

1. Alt-Holland A, Shamis Y, Riley KN, DesRochers TM, Fusenig NE, Herman IM, Garlick JA. E-cadherin suppression directs cytoskeletal rearrangement and intraepithelial tumor cell migration in 3D human skin equivalents. *J Invest Dermatol*. 2008;128:2498–507.
2. Tompkins R, Burke J. Progress in burn treatment and the use of artificial skin. *World Journal of Surgery* 1990; 14(6):819–24, doi: 10.1007/BF01670529.
3. Cooper G. Cell walls and the extracellular matrix. In *The Cell: A Molecular Approach*. 2nd edition, 2000, Sunderland, MA, Sinauer Associates.
4. Jones I, Currie L, Martin R. A guide to biological skin substitutes. *British Journal of Plastic Surgery* 2002;55:185–93. doi: 10.1054/hips.2002.3800.
5. Zhang Z, Michniak-Kohn B. Tissue engineered human skin equivalents. *Pharmaceutics*, 2012;4:26–41, doi:10.3390/pharmaceutics4010026.
7. Robert L, Vacanti JP. Artificial Organs. *Scientific American* 1995;130–33. Online Article. Available from: <http://www.madehow.com/Volume-3/Artificial-Skin.html#ixzz7ZgqRv1I4>. [Last Accessed on 15th May, 2022]
8. McCarthy, Michael. “Bio-engineered tissues move towards the clinic,” *The Lancet*, August 17, 1996, p. 466. Online Article. Available from:

<http://www.madehow.com/Volume-3/Artificial-Skin.html#ixzz7ZgkBctbZ>. [Last Accessed on 15th May, 2022]

9. Rhonda RL. Cells ‘Tricked’ To Make Skin For Burn Cases. *The Wall Street Journal* 1994. Online Article. Available from: [Burn Researchers Use Old Inkjet Printers To Make Human Skin](#). [Last Accessed on 15th May, 2022]

Cite this article as:

Kaur R, Kaushal C. Artificial Skin: A Review. *Int Healthc Res J*. 2022;6(7):RV4-RV6. <https://doi.org/10.26440/IHRJ/0607.10571>

AUTHOR AFFILIATIONS: (*Corresponding Author)

1. Intern (<https://orcid.org/0000-0003-4186-1408>)
2. BDS Final Year Student (<https://orcid.org/0000-0002-7442-6173>)
Himachal Dental College, Sundernagar, Himachal Pradesh, India.

Source of support: Nil, Conflict of interest: None declared

Contact Corresponding Author at: rumeet1999[at]gmail[dot]com

Brimonidine Induced Hypertensive Acute Granulomatous Anterior Uveitis

MASSOUD HINA¹, JASMINE BHASIN², JOANNA XAVIER³

A
B
S
T
R
A
C
T

Brimonidine is a medication used to treat open-angle glaucoma, ocular hypertension, and rosacea. It is used as eye drops or applied to the skin. Common side effects when used in the eyes include itchiness, redness, and a dry mouth. We present a case of Brimonidine induced Hypertensive acute granulomatous anterior uveitis.

KEYWORDS: Brimonidine, Uveitis, Adverse Drug Reaction

INTRODUCTION

Some of the most common side effects of brimonidine are photophobia, conjunctival hyperemia, follicular conjunctivitis, itchy eyes, allergic conjunctivitis, and allergic blepharitis.^{1,2} These can cause to patients discontinue treatment. Allergic reactions are more common with brimonidine than with Beta-blockers. They resolve with the withdrawal of treatment. Another less common but potentially more dangerous side effect than those mentioned previously is the occurrence of acute anterior granulomatous uveitis.¹⁻⁵ This uveitis often tends to be hypertensive and associated with bilateral follicular conjunctivitis.

CASE REPORT

A 78-year-old female who presented to us with a clinical picture of eye discomfort and bilateral eye redness for several days. The patient's systemic medical history included in particular the presence of non-insulin-dependent diabetes mellitus. Where ophthalmology is concerned, the patient had been receiving topical treatment with Brimonidine/timolol every 12 h by primary open-angle glaucoma from 2 years prior. She had undergone phacoemulsification in both eyes 6 years ago without complications. At the time of consultation, intraocular pressure (IOP) using applanation tonometry was 40 mmHg in the right eye (RE) and 42 mmHg in the left eye (LE). Best-corrected visual acuity was 1/10 in both eyes (BE). The slit lamp examination showed conjunctival hyperemia accompanied by signs of blepharitis and chronic conjunctivitis with a follicular reaction in the tarsi and inferior symblepharon in BE. The cornea presented with fine and diffuse epithelial keratitis; and thick,

endothelial keratic precipitates, with an appearance of mutton fat bilaterally. The anterior chamber was wide and there was an inflammatory reaction of 2+. The iris was normal, with no transillumination defects, with a round pupil without synechiae. The intraocular lens showed no alterations. There was no vitritis or inflammatory chorioretinal foci. Faced with bilateral anterior granulomatous hypertensive uveitis, we decided to start topical treatment with 1% prednisolone acetate 6 times daily in a descending regimen, cyclopentolate 3 times daily, artificial tears and a 1 g valacyclovir tablet three times daily. While there was no infectious ophthalmological history, given that the uveitis was hypertensive, antiviral treatment was started for possible herpes. Two days after the consultation in the emergency room IOP was 46 mmHg in the RE, and 44 mmHg in the LE. The anterior pole was of the same appearance as in the previous visit and the inflammation of the anterior chamber continued. The systemic diagnostic screening for uveitis and HLA-B27 typing were negative. The irritative reaction presented by the conjunctiva in both eyes and the fact that uveitis was bilateral with negative results in the systemic diagnostic screening for uveitis made us consider the possibility of brimonidine-associated hypertensive uveitis on finding literature that supported us in our clinical suspicion. For this reason, the suspect drug was discontinued and a fixed combination of dorzolamide and timolol was added. The corticosteroid eye drops regimen cyclopentolate, was continued and artificial tears and antiviral treatment via the oral route was discontinued. Two weeks after withdrawing brimonidine, the best



© Mir Tabish Sayeed et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 08-Mar-2022; Accepted on: 11-Oct-2022

corrected visual acuity was 2/10 in RE, and 5/10 in LE. The IOP 25 and 24 mmHg in RE and LE respectively. The conjunctival hyperemia had disappeared, the corneal epitheliopathy had lessened, as well as the mutton-fat precipitates in the endothelium. There was no inflammation in the anterior chamber. Due to the absence of inflammation in the anterior chamber and the clear improvement of the endothelial precipitates, we decided to add a single daily of latanoprost to the treatment. One week after incorporating prostaglandin to the topical treatment and three weeks after withdrawing brimonidine, IOP was 20 mmHg in BE. The endothelial precipitates were sparse and pigmented and the corneal epithelium was of better appearance. There was no inflammation in the anterior chamber. Three months after withdrawing brimonidine, IOP was 17 mmHg in the RE and 14 mmHg in the LE. The corneal epithelium showed no positive lesions in the fluorescein stain and with regard to the endothelium, residual remnants of the keratic precipitates persisted. The descending corticosteroid treatment regimen had ended 2 months prior, and there was no evidence of new inflammatory activity.

DISCUSSION

The pathophysiology of brimonidine-induced anterior uveitis is unknown. A correlation has been established in the literature between allergic conjunctival reactions and predisposition to anterior uveitis.² The first manifestations of allergic conjunctivitis from brimonidine usually appear between 6 and 12 months after the commencement of treatment. It is thought that there is a decrease in the density of the conjunctival cells associated with an enlargement of the intercellular spaces induced by alpha-adrenergic agonists, thus favoring the flow of the mediators of inflammation responsible for the allergic reaction.²

Some authors argue that uveitis appears systematically after a phase of chronic allergic conjunctivitis and would be related to prolonged application of treatment despite ocular surface irritation symptoms. This could justify the lower frequency of anterior uveitis cases with respect to the cases of brimonidine induced conjunctivitis diagnosed in daily clinical practice. The increase of proinflammatory cytokines in the aqueous humor after a long period of brimonidine treatment may contribute to the development of brimonidine-induced uveitis, and therefore be an essential part of its pathophysiology.³ The literature suggests that there is usually a time frame of between 6 to 18 months from starting treatment with brimonidine until the anterior

granulomatous uveitis appears, with a run-in phase of allergic conjunctivitis. There is a predominance of females in the patients affected and in a third of cases the uveitis is hypertensive.

Once the suspected diagnosis is reached, the effective treatment is withdrawal of the brimonidine eye drops, with the addition or not topical corticosteroids to control the inflammatory process, depending on the severity of clinical picture.

CONCLUSION

Acute anterior granulomatous uveitis secondary to treatment with eye drops containing brimonidine is a rare adverse effect, but one that must be considered. In general, there is little knowledge amongst ophthalmologists of this potential effect of brimonidine. It would be worthwhile for medical professionals who prescribe this drug to indicate to their patients the need to seek medical attention rapidly if symptoms compatible with the disease appear. It is a process with an excellent prognosis. Therefore, in cases with a strong clinical suspicion that the uveitis is induced by brimonidine, withdrawal of the eye drops is the step required for the definitive diagnosis and corresponds to the treatment itself.

REFERENCES

1. Byles DB, Frith P, Salmon JF. Anterior uveitis as a side effect of topical brimonidine. *Am J Ophthalmol.* 2000;130:287-91.
2. Comet A, Donnadieu B, Courjaret JC, Gascon P, Denis D, Matonti F. Brimonidine and acute anterior granulomatous uveitis: A case report and literature review. *J Fr Ophtalmol.* 2017;40(4):e127-e129.
3. Shin HY, Lee HS, Lee YC, Kim SY. Effect of Brimonidine on the B Cells, T Cells, and Cytokines of the Ocular Surface and Aqueous Humor in Rat Eyes. *J Ocul Pharmacol Ther.* 2015;31(10):623-6.
4. Beltz J, Zamir E. Brimonidine Induced Anterior Uveitis. *Ocul Immunol Inflamm.* 2016;24(2):128-33.
5. Casado A, Cabarga C, de la Fuente MA, Muñoz-Negrete FJ. Suspected granulomatous anterior uveitis associated with brimonidine tartrate 0.2% and timolol maleate 0.5% ophthalmic solution. *Graefes Arch Clin Exp Ophthalmol.* 2013;251(11):2659-60.

Cite this article as: Hina M, Bhasin J, Xavier J. Brimonidine Induced Hypertensive Acute Granulomatous Anterior Uveitis. Int Healthc Res J. 2022;6(7):CR1-CR3. <https://doi.org/10.26440/IHRJ/0607.10570>

AUTHOR AFFILIATIONS: (*Corresponding Author)

1. MBBS, Consultant Practitioner, Nurpur, Fenchuganj, Bangladesh
2. MD (Pediatrics), Consultant Physician, Biratnagar, Nepal
3. M.PT, Nurpur, Fenchuganj, Bangladesh

Source of support: Nil, **Conflict of interest:** None declared

Contact Corresponding Author at: editor[dot]ihrij[at]gmail[dot]com



Pulmonal Bacillus Calmette-Guerin Infection 24 Months after Intravesical BCG Installation

DAVID JONES^{*1}, NICK CYRUS², NITHYA SINGHAL³

A
B
S
T
R
A
C
T

BCG (Bacillus Calmette-Guérin) immunotherapy is a method which is an emerging form of cancer treatment. BCG attaches to the bladder wall and stimulates an immune response to destroy the cancer cells. Complications of BCG therapy are due to reactivated infection or a hypersensitivity reaction and thus may be treated with antimycobacterial agents, corticosteroids, or both. BCG therapy instillations should also be stopped if complications occur during the treatment period. We present a case wherein a subject suffered from a disseminated BCG infection 2 years after BCG instillation.

KEYWORDS: Bacillus Calmette-Guerin, BCG, Instillation, Mycobacterium

INTRODUCTION

Attenuated bacillus Calmette-Guerin (BCG), a live attenuated strain of *Mycobacterium bovis*, is used primarily for vaccination against tuberculosis (TB), but in some parts of the world BCG is also used for immunotherapy. BCG is used for treatment of low-grade urothelial tumors, in which case BCG is administered by intravesical instillation.¹ More than 95% of all patients tolerate this treatment well and experience no complications. The most common adverse events are local, mild, and self-limiting; serious events include systemic effects but they are very rare. Internationally, sepsis has been reported in approximately 0.4% and pneumonitis/hepatitis in approximately 0.7% of treated patients [1]. Risk factors for complications after BCG instillation include traumatic catheterization, cystitis, and poor immunological status.^{1,2} Whether systemic disease after BCG flush is due to bacterial dissemination and/or hypersensitivity reaction is subject to ongoing debate.² The hypersensitivity theory is supported by the fact that patients respond well to glucocorticoids added to the anti-tuberculosis regimen, and that demonstration of bacteria is extremely uncommon.¹ However, the rare findings of BCG in tissue outside the bladder unarguably support the dissemination theory² and there is growing consensus that both mechanisms are valid.² This case report is about one of the few cases in which the diagnosis of disseminated BCG infection was verified through polymerase chain reaction (PCR) and culturing of BCG. Through genotyping it was possible

to conclude that the patient's clinical disease was more than likely due to bacterial dissemination from the bladder.

CASE STUDY

A 64-year-old male was admitted to the hospital with pneumonia and signs of sepsis. He had severe COPD and papilloma of the bladder and was being monitored in a follow-up period after BCG instillations for these conditions. The patient was in poor general condition and had experienced unintended weight loss of 12-14 kg over 2-3 months prior to admission. He also had a personal history of over-consumption of alcohol. As the pneumonia was resistant to treatment, suspicion of TB was raised. The patient had been treated for pulmonary TB ten years earlier. Because of suspected recurrence of TB, two expectorate samples were sent to be tested for mycobacteria. On laboratory examination, acid-alcohol-fast bacilli were identified through auramine-rhodamine staining and PCR was positive for the *M. tuberculosis* complex, for which reason treatment was changed to four-drug standard tuberculosis therapy (isoniazid, rifampicin, ethambutol, and pyrazinamide). Surprisingly, culture and type determination subsequently found that this was *Mycobacterium bovis* BCG, and the patient was diagnosed with BCGitis. Through genotyping using the latest gold standard method mycobacterial interspersed repetitive unit variable number of tandem repeats³, a known vaccine strain was identified which, in terms of genotype, was the strain used for BCG instillation two years earlier.



© David Jones et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 12-May-2022; Accepted on: 01-Oct-2022

DISCUSSION

There is only anecdotal reporting of culture-verified BCGitis², making this case study a challenge in terms of differential diagnosis, especially in the light of the patient's previous history of TB. But it is precisely through the patient's history that the suspicion of "BCGitis" was brought up, as it is known, that systemic disease can, albeit rarely, occur several years after a BCG instillation.² In all patients previously treated with BCG flushes, one must be aware of a possible connection with the patient's current condition, even if it has been many years since the patient was exposed to BCG. The patient in the case study was offered referral for immunological investigation but declined. In the light of his over-consumption of alcohol and poor general condition, it is not difficult to imagine that he had some level of compromised immune defense, which may have played a role in the activation of BCG, but this remains unknown.

The clinical consequence lies in the fact that BCG strains are naturally resistant to pyrazinamide and in some cases also to isoniazid. The strain in the case study was a BCG-medac, which is a RIVM derived strain 1173-P2. This strain is also pyrazinamide-resistant, but is fully sensitive to isoniazid, rifampin, rifabutin, ethambutol, and second-line anti-tuberculosis drugs.⁴ A rational therapeutic choice therefore demands that the correct diagnosis is obtained by sending appropriate samples to be tested for mycobacteria, even when there is confidence in the diagnosis on the basis of clinical assessments and medical history.

REFERENCES

1. Lamm DL, van der Meijden PM, Morales A, Brosman SA, Catalona WJ et al. Incidence and treatment of complications of bacillus Calmette-Guerin intravesical therapy in superficial bladder cancer. *J Urol.* 1992;147(3):596-600.
2. Elkabani M, Greene JN, Vincent AL, VanHook S, Sandin RL. Disseminated Mycobacterium bovis after intravesicular bacillus calmette-Gu rin treatments for bladder cancer. *Cancer Control.* 2000;7(5):476-81.
3. Supply P, Allix C, Lesjean S, Cardoso-Oelemann M, Rüsch-Gerdes S et al. Proposal for standardization of optimized mycobacterial interspersed repetitive unit-variable-number tandem repeat typing of Mycobacterium tuberculosis. *J Clin Microbiol.* 2006;44(12):4498-510.
4. Ritz N, Tebruegge M, Connell TG, Sievers A, Robins-Browne R, Curtis N. Susceptibility of Mycobacterium bovis BCG vaccine strains to antituberculous antibiotics. *Antimicrob Agents Chemother.* 2009;53(1):316-8.

Cite this article as:

Jones D, Cyrus N, Singhal N. Pulmonal Bacillus Calmette-Guerin Infection 24 Months After Intravesical BCG Installation. *Int Healthc Res J.* 2022;6(7):CR4-CR5. <https://doi.org/10.26440/IHRJ/0607.10566>

AUTHOR AFFILIATIONS: (*Corresponding Author)

1. Consultant Paediatrician, Warsaw, Poland
2. MD (Medicine), Darkhan, Mongolia
3. MBBS, Darkhan, Mongolia

Source of support: Nil, **Conflict of interest:** None declared

Contact Corresponding Author at: editor[dot]ihrj[at]gmail[dot]com



An Assessment of the Prosthodontic Status of People Visiting a Dental Clinic in a South Indian City

SOMIL CHADDHA¹, RAM CHANDRA TEJA^{*2}

BACKGROUND: Oral diseases among elderly can directly affect their Quality of Life.

AIM: To assess the prosthodontic status of people visiting a dental clinic in a south Indian city.

MATERIALS AND METHOD: The present study is an attempt to study the prosthodontic status of people attending a private clinic in Delhi from August to November 2021. Data was collected with the help of WHO Oral Health Assessment Form (2004) and survey was conducted as per guidelines of American Dental Association for Type III examination. Statistical analysis was done using SPSS 23.0.

RESULTS: Out of 384 study subjects, 30.2% were completely dentulous, 17.8% were completely edentulous and rest were partially edentulous for the maxillary arch. While 14.8% were completely dentulous, 12.4% were completely edentulous and 72.8% were partially edentulous for the mandibular arch. Prosthodontic status for both the maxillary and mandibular arches.

CONCLUSION: The study population had a poor prosthodontics status. High cost of prosthetic treatment, lack of availability of skilled healthcare professionals, poor infrastructure and the general attitude of the population towards replacement of missing teeth are the major hindrances in the way of healthcare delivery system in our country. This has led to the poor prosthodontic status in general population.

KEYWORDS: Prosthodontic Status, Edentulous, Elderly

INTRODUCTION

Aging is a natural process, and with it, there are various physical and biological changes occurring in one's body. With advancements in technology, the average life span of an individual has increased significantly. This has led to increased number of elderly population and has further offered the dental health-care professionals to observe exceptional challenges to treat this section of elderly.¹

It is an established fact that loss of teeth has a negative impact on the oral health as well as the emotional well being of an individual.² It has been reported that one's general health is related to oral health and general health is related to quality of life, tooth loss could have an impact on quality of life.

Loss of teeth is associated with a variety of factors like oral hygiene practices, habits, socio economic status, literacy level, cultural beliefs and attitudes.³ Major reasons for tooth loss can be dental diseases like caries or periodontal pathology, traumatic injuries, congenitally missing teeth or extractions. It is predicted that the elderly population of India shall be the highest in the world by 2025.³

Over the past few years, several measures have been taken by the authorities to improve the oral health

status in Indian population. These have primarily focussed on the preventive aspects which have definitely brought down the incidence of dental disease amongst children and adults. At the same time, prosthetic needs of the population by and large have not been addressed to the same extent. High cost of prosthetic treatment, lack of availability of skilled manpower, infrastructure and the general attitude of the population towards prosthetic replacement of missing teeth are the major barriers of healthcare delivery system in our country.

Prosthetic replacements can vastly improve the oral health and function. Prosthodontic rehabilitation has the ability to reduce and, in many respects, eliminate the deficits attributable to lost teeth, and patients of all ages, properly motivated, can adapt to dental prosthesis that are carefully designed. Therefore, the present study was conducted to assess the prosthodontic status of people visiting a dental clinic in a south Indian city.

MATERIALS AND METHOD

The present study was an attempt to study the prosthodontic status of people attending a private dental clinic in south India. The Inclusion criteria was subjects 14 years or more in age and only permanent dentition was considered. Subjects were informed of



© Somil Chaddha et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY-NC 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the use is not commercial and the original author(s) and source are cited.

Submitted on: 29-Feb-2022; Accepted on: 02-Oct-2022

the nature of the investigation and were included in the study after their written consent was obtained.

A survey performa was prepared with the help of WHO Oral Health Assessment Form (2004) and was framed to collect information regarding the demographic profile, educational status, income, occupation and various other factors which influenced the prosthodontic status and needs. A recording assistant was trained to assist in recording the investigation results recorded by the examiner. The survey was systematically scheduled to spread over a period of 4 months from August 2021 to November 2021. The presence of prostheses was recorded for each jaw. The following codes were used to record prosthodontic status: 0 – No prosthesis, 1 – Bridge, 2 – More than one bridge, 3 – Partial denture, 4 – Both bridge(s) and partial denture(s), 5 – Full removable denture, 9 – Not recorded. The subjects were examined with mouth mirror and explorer under natural light/ torch as per guidelines of American Dental Association for Type III examination. Armamentarium used included plane mouth mirrors, explorers, tweezers, kidney trays, sterilized Cotton / gauze pieces, disposable mouth masks, disposable gloves, torch, hand towels, data collecting sheet, pen, pencil.

Subjects were examined seated in a dental chair. The recorder was made to sit close to the examiner so that the instructions and codes could be easily heard. Immediately after the examination, oral health instructions were given as and when required.

For investigation disposable mouth masks and gloves were used. Instruments were sterilized by autoclaving and chemical sterilization. After each day of the survey, all the instruments were sterilized by autoclaving in the clinic for reuse. The data was transferred from pre-coded survey form to computer. A master file was created for the purpose of data analysis. SPSS version 20.0 was used for the statistical analyses. Descriptive statistics, chi-square tests were applied during the statistical evaluation of the data.

RESULTS

The present study consisted of 384 study subjects having age range from 18 to 76 years with mean age of 41.8 ± 14.6 years. The maximum number of study subjects (29%) belonged to 21–30 years of age. There were 201 males and 183 females and is depicted in table 1.

Gender	Frequency	Percent
Male	201	52.3
Female	183	47.7
Total	384	100.0

Table 1. Distribution of study population according to gender.

Out of 384 study subjects, 30.2% were completely dentulous, 17.8% were completely edentulous and rest were partially edentulous for maxillary arch. While 14.8% were completely dentulous, 12.4% were completely edentulous for the mandibular arch. (Table 2&3)

Missing teeth mandible	Frequency	Percent
Completely dentulous	116	30.2
Kennedy class I	48	12.5
Kennedy class II	62	16.1
Kennedy class III	58	15.1
Kennedy class IV	32	8.3
Completely edentulous	68	17.8
Total	384	100.0

Table 2. Distribution of study population according to missing teeth in maxillary arch.

Missing teeth maxilla	Frequency	Percent
Completely dentulous	57	14.8
Kennedy class I	60	15.6
Kennedy class II	79	20.6
Kennedy class III	84	21.8
Kennedy class IV	57	14.8
Completely edentulous	47	12.4
Total	384	100

Table 3. Distribution of study population according to missing teeth in mandibular arch.

Most partially edentulous subjects lost their teeth due to caries and the next common factor was periodontal issue. (Table 4)

Reason for loss of teeth	Frequency	Percent
Caries	206	53.6
Periodontal	86	22.3
Trauma	42	10.9
Not applicable	50	13.2
Total	384	100.0

Table 4. Distribution of study population according to reason for loss of teeth.

The study comprised of 384 subjects in the age range of 19-76 years. There were 206 males and 178 females. Edentulism increased with age, majority of subjects who were edentulous, belonged to age group of 60 years and above. Prosthodontic status for both the maxillary and mandibular arch was very poor with 59.6% and 51.8% individuals being devoid of any kind of prosthesis in the maxillary and mandibular arch respectively. Table 5 and 6 show the prosthodontic status of the study population in both the maxillary and mandibular arch.

DISCUSSION

The present study reveals that complete edentulousness increased with increase in age. These results were similar to the results obtained by Shah N (2004).⁴ Subjects above the age of 60 years needed complete dentures as compared to the younger age group who had a higher need for partial dentures. This may be because in the rural elderly, knowledge regarding availability of prosthetic services is very low.

Prosthodontic status maxillary arch	Frequency	Percent
No prosthesis	229	59.6
Bridge	36	9.3
Partial denture	42	10.9
Full removable denture	77	20.2
Total	384	100.0

Table 5. Distribution of study population according to prosthodontic status in maxillary arch.

Prosthodontic status mandibular arch	Frequency	Percent
No prosthesis	199	51.8
Partial denture	56	14.5
Full removable denture	129	33.7
Total	204	100.0

Table 6. Distribution of study population according to prosthodontic status in mandibular arch.

The prosthetic status in males and females in this study population showed significant differences with the higher percentage of females having a full removable prosthesis. The females were more concerned about the negative impact of loss of teeth on their appearance.

The prevalence of the partially edentulous condition indicates a lack of progress towards controlling dental disease or the patient's affordability of fixed prostheses. The prevalence of Kennedy's Class III was more in accordance with the findings by Geetha Prabhu et al. (2011).⁵ Dental caries was the most important reason for tooth loss in our study population. It constituted about 105(51.5%) followed by periodontal disease 44(11.6%) and trauma 12 (5.8%). This finding confirmed that caries remains a problem in adults. This finding agreed with other studies by Prabhu et al (2009).⁶

The fact that dental caries is the leading cause of tooth loss may be attributed to changes in diet in both rural and urban areas.

The results of the present study highlight a very poor prosthodontic status which are in accordance to the results of the studies carried out by Nadgere J et al (2010)⁷ and Shah VR et al. (2012).⁸ It still remains a challenge for most developing countries to establish policies and programs to effectively provide oral healthcare to the masses. Various measures suggested below can be employed to meet this goal.

Oral health care delivery should be made a part of the general health care programs. Primary health care workers can help spread awareness about the

importance of regular oral health check-up and the importance of prosthodontic rehabilitation.

The dentists in the rural set ups should be educated to not practice extraction as a simpler form of treatment, rather stress and educate people for preventive and restorative procedures which will eventually lower the prosthodontic need.

Mobile dental clinics, outreach programs, door to door campaigning, offering subsidized or free prosthodontic rehabilitation, provision of dental insurance schemes by the state government, setting up of separate geriatric clinics can help in improving the current situation.

There were a few limitations of this study. The first limitation was its cross-sectional nature, which limits our ability to relate the time pattern to the present dental status of the subjects interviewed. Second, unrestorable teeth as well as root stumps were considered as teeth being present. Such teeth which were indicated for extraction but still present in the mouth will add to the treatment needs. Also, the existing prosthesis which were faulty were counted as prosthesis being present but were indicated for replacement which would add to the treatment need.

In certain shortened dental arches, the patient may not experience much change in the masticatory function. Thus, in those individuals in which sufficient number of occluding pairs are present prosthodontic replacement may not be required thus lowering the prosthodontic need.

CONCLUSION

The findings of this study clearly demonstrate a high prosthodontic status among the population surveyed. To improve the oral health and prosthodontic status, it is necessary to spread awareness regarding the importance and benefits of prosthodontic treatment. Results show that the prosthodontic status is very poor. Edentulism should be declared as a disease and also the consequences of edentulousness should be described to the population. A greater awareness regarding proper dental hygiene and timely replacement of the missing teeth needs to be stressed among the general public. In the rural elderly, knowledge regarding availability of prosthodontic services is very low which translates into a high unmet prosthodontic need. Many of them did

not know that just a few missing teeth could be replaced. Prosthodontic services are not available in most of the government run hospitals and that there were wide gaps between level of edentulousness, denture wear and denture needs of the community are the issues that need to be addressed to improve the situation that currently exists.

REFERENCES

1. Yadav N, Yadav R, Pahuja M, Pardhan S, Miglani S, Malik T. An evaluation of prosthetic status and treatment needs among institutionalized elderly individuals of Delhi, India. *Indian J Dent Sci* 2017;9:22-5
2. Kuo HC, Yang YH, Lai SK, Yap SF, Ho PS. The Association between health-related quality of life and prosthetic status and prosthetic needs in Taiwanese adults. *J Oral Rehabil.* 2009;36; 3:217-25.
3. Eachempati P, Shenoy VK, Jain N, Singh S. Prosthodontic status and needs of elderly institutionalized residents in Mangalore: A prospective study. *Indian J Dent Res* 2013;24:284-8
4. Shah RJ, Diwan FJ, Diwan MJ, Chauhan VJ, Agrawal HS, Patel GC. A study of the emotional effects of tooth loss in an edentulous Gujarati population and its association with depression . *J Indian Prosthodont Soc* 2015;15:237-43
5. Prabhu G, Prabhu R, Rai R, Ilango T, Easwaran MA, Shakir IA. The Quality of Oral Rehabilitation in the Partially Edentulous South Indian Population: A Cross Sectional Study. *J Clin Diagn Res.* 2011;5:1478-1480
6. Prabhu N, Kumar S, D'souza M. Partial edentulousness in rural population based on Kennedy's classification: an epidemiological study. *J Indian Prosthodont Soc* 2009;9: 18-23.
7. Nadgere J, Doshi A G, Kishore S. An Evaluation of Prosthetic Status and Prosthetic Need amongst people living in and around Panvel, Navi-Mumbai-A Survey. *Int J Prosthet Dent* 2010;1:6-9.
8. Shah VR, Shah DN, Parmar CH. Prosthetic status and prosthetic need among the patients attending various dental institutes of Ahmedabad and Gandhinagar district, Gujarat. *J Indian Prosthodont Soc.* 2012;12(3):161-7.

Source of support: Nil, **Conflict of interest:** None declared

Cite this article as:

Chaddha S, Teja RC. An Assessment of the Prosthodontic Status of People Visiting a Dental Clinic in a South Indian City. *Int Healthc Res J.* 2022;6(7):OR1-OR5. doi: <https://doi.org/10.26440/IHRJ/0607.10573>

AUTHOR AFFILIATIONS:

1. MDS (Oral Pathology), Ernakulam, Kerela, India
2. MDS (Oral Surgery), Ernakulam, Kerela, India

Contact e-mail for corresponding author: rvt6523[at]yahoo[dot]in