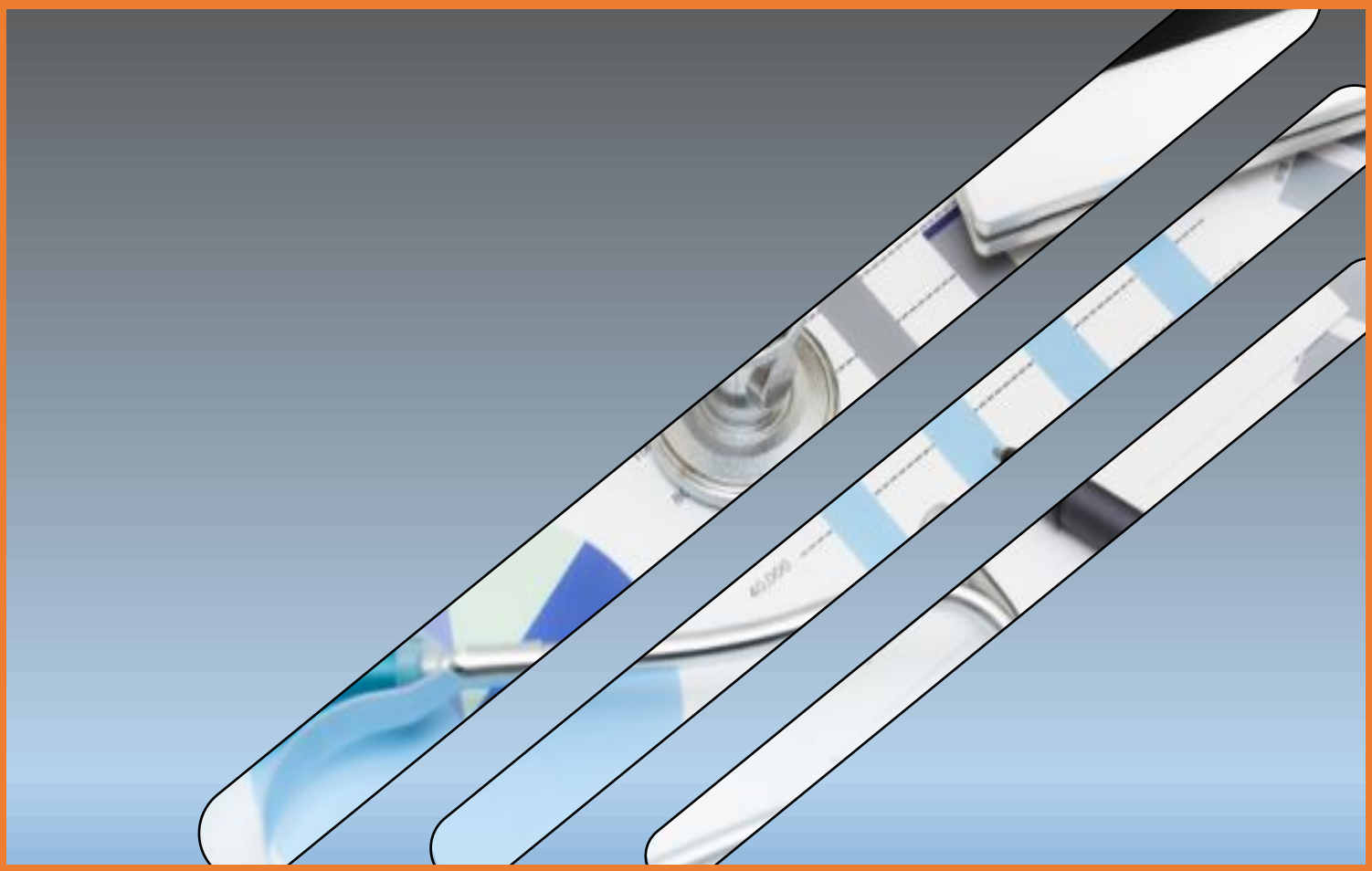

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GUEST COMMENT

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Tideglusib: The Miracle Molecule for Tooth Repair

SAHIL GUPTA

Dental caries is the most common reason behind a dental visit. The prevalence of dental caries across the globe is too high and restoration, commonly known as filling is the conventional treatment to repair damage caused by tooth decay wherein the procedure typically involves removing the damaged part of the tooth and replacing it with a restorative material which stays in the tooth and does not degrade. Thus, the normal mineral volume of the tooth is never restored completely. At late stages, when pulp is involved, time intensive root canal treatment is done. For teeth that cannot be saved by these treatment options, extraction is the only answer. The revolutions in biological and digital information are quickly converging with dental science and dentistry is at the threshold of new discoveries.[1]

Glycogen synthase kinase-3 inhibitor have been studied as a potential therapeutic agents in depression, anxiety, schizophrenia, Alzheimer's disease, supranuclear palsy, fragile X syndrome, multiple sclerosis, Parkinson's disease, Huntington's disease, stroke, traumatic brain injury, spinocerebellar ataxia type 1, sepsis, asthma, arthritis, colitis, peritonitis and various types of cancers.[2] These drugs have the capacity to modulate human stem cells in vivo.

Tideglusib, a glycogen synthase kinase-3 inhibitor, initially tested for its role in Alzheimer's disease and psychiatric disorders, has the potential to change the conventional treatment of dental caries owing to its property to regrow dentine to fill a void. Research suggests that this drug could help protect the inner layer by stimulating the production of the dentine allowing the tooth to repair itself. Zaugg LK et al., in their study on rat teeth, showed that Tideglusib can equally enhance reparative dentine formation to fully repair an area of dentine damage up to 10 times larger, mimicking the size of small lesions in human. In this research, Tideglusib treated teeth revealed significantly more mineralized tissue and more dentine volume compared to the control group. The researchers were able to repair a surface damage area of 0.1 mm^2 and volume of 0.055 mm^3 completely.[3] The mechanism behind this act of Tideglusib seems to be the activation of the Wnt/β-cat signaling pathway of resident mesenchymal stem cells from the tooth pulp wherein Axin 2 is a negative regulator and a downstream target. The enzyme glycogen synthase kinase 3 is a prime cytoplasmic component of Wnt/β -cat signal transduction that phosphorylates Beta catenin and Axin, furthermore leading to ubiquitination and degradation. This all happens in the absence of Wnt ligand/receptor binding. When these ligands are available, GSK-3 activity is inhibited and this allows Beta-catenin to enter the nucleus where it interacts with Lef/Tcf transcription factors and regulates the expression of the target genes including Axin2. The addition of Wnt signaling agonists provides an effective way to stimulate reparative formation of dentinal tissue and restores lost dentine with naturally generated new dentinal tissue.[4]

The dental tissue produced by Tideglusib stimulation integrates itself completely with the enamel tissue which means the tooth is not only simply repaired and compensated but is regrown and restored back to health.[5]

In a study conducted by del Ser et al., the use of Tideglusib was associated with mild to moderate adverse drug reactions, including transient increase in serum creatine kinase, ALT or gGT, diarrhea, nausea, cough, fatigue, and headache.[6] Tideglusib is remarkably cheap and has a good safety profile making it more compliant with the subjects.

Regenerative medicine aims to restore the original composition, functions and properties of lost tissues. A novel, biology based new generation treatment for dental caries is required. The use of Tideglusib is such an approach where dentinal restoration is stimulated via the mobilization of resident stem cells in the tooth pulp leading to the formation of natural reparative

dentine. Promising potential for translational research approaches has been highlighted by use of tideglusib in animal studies. This property needs to be tested in human subjects respecting the ethical and regulatory criteria. Large scale clinical trial to explore the efficacy and safety of tideglusib in dental practice need to be designed and executed.

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REVIEW

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Infection Control in Endodontics During COVID Era: A Review

DEEPIKA[1], AJAY KUMAR NAGPAL*[2], ROHIT PAUL[3]

ABSTRACT

The outbreak of the SARS-CoV-2 pandemic has continued to affect people's lives on a global scale. When the number of infected cases decreased, several countries across the world lifted their lock-down controls and started to open. But the latest re-emergence of COVID-19 cases across Europe once again prompted nations to step back to contain the virus spread. The most prevalent route of transmission is through aerosols and droplet inhalation, which is crucial for dental health workers as most dental procedures generate significant amounts of droplets and aerosols. Thus, it is imperative to follow infection control strategies and patient management protocols to ensure optimum dental care and at the same time prevent nosocomial infection in dental settings. This review provides an insight into the steps taken for infection control and prevention from COVID-19 transmission in endodontic practices.

KEYWORDS: COVID-19, Personal Protective Equipment (PPE), Aerosol, Infection Control

INTRODUCTION

A new coronavirus of unknown origin was discovered in Wuhan, China, in December 2019.[1] On 11th March 2020, the World Health Organization (WHO) declared the Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as pandemic due to the public health threat.[2] Coronaviruses belong to the family of Coronaviridae, of the order Nidovirales, comprising enveloped, non-segmented, positive-sense RNA as their genome. They are subcategorized into four genera, namely Alphacoronavirus (α-CoV), Betacoronavirus (β-CoV), Gammacoronavirus (γ-CoV) and Deltacoronavirus δ -CoV. The α -CoV and β -CoV are known to infect the humans and mammals, while γ -CoV and δ -CoV cause infections among birds.[3] Coronaviruses is characterized by the club-shaped spike projections emanating from the surface of the virion giving an appearance of solar corona, suggesting the name, coronaviruses.[4] SARS-CoV, and MERS-CoV have caused pandemics in humans 2002-2003 and 2012 respectively. The outbreak of Severe Acute Respiratory Syndrome (SARS) was first reported in China and Middle East Respiratory Syndrome (MERS) first emerged in Saudi Arabia and subsequently spread to other countries.[5]

TRANSMISSION

Human-to - human SARS-CoV transmissions have been reported to occur through the coupling between the receptor-binding domain of virus spikes and the cellular receptor known as the angiotensin-converting enzyme 2 receptor.[6] Notably, the pattern of COVID-19 spikes in the receptor-binding domain is similar to that of SARS-CoV and pair-wise protein sequence analysis found that it belonged to the SARS-related coronavirus. Entry into the host cell is through the same receptor, ACE2 in both COVID- 19 and SARS-CoV.[7]

POSSIBLE ROUTES OF TRANSMISSION

Human-to-human transmission: Current evidence shows that there is a human to human transmission of COVID-19[8], implying that it is the main mode of transmission of the disease. Patients with signs of COVID-19 will usually spread the disease to those in near contact.[9,10] However, several patients with COVID-19 are asymptomatic and can act as carriers and unknowingly transmit the virus.

Direct contact transmission: Respiratory secretions or droplets released by infected individuals may contaminate surfaces and objects creating fomites. Depending on the atmospheric conditions like humidity, temperature, type of surface, the possibility to find large concentrations of viable SARS –CoV-2 virus, is high in health care centres where coronavirus infected patients are being treated. Transmission can often occur indirectly by interaction with materials in the immediate surroundings or virus-contaminated items from the infected person accompanied by contact with the mouth, nose, or eyes.[11]

Aerosol transmission: The aerosols generated from coughs and sneezes that infect the immediate surrounding are among media for virus spread.[12] Aerosol transmission from both symptomatic and asymptomatic COVID-19 positive patients can be source of infection.[13]

Droplet Transmission Respiratory droplets are greater than 5-10 µm in diameter while those less than 5 µm are classified as aerosols or droplet nuclei. Transmission through these droplets occurs when a person comes in close contact with an infected subject with respiratory symptoms. Respiratory droplets containing virus can reach the mucous membrane of oral cavity, nose or eyes of a susceptible person and can lead to infection.[11]

TRANSMISSION ROUTE AMONG DENTISTS

Airborne spread: In a dental setting, the various procedures involving the use of high-speed handpiece or ultrasonic instruments may cause patient secretions, saliva, or blood to aerosolize the virus into the surroundings. Thus, droplet and aerosol transmission from the COVID-19 patients are the most important concerns in dental clinics and hospitals.[12]

Contact spread: A dental professional's direct or indirect contact with human fluids, patient products, and infected dental instruments or environmental surfaces can contribute to the spread of viruses.[14]

Contaminated surfaces spread: Coronaviruses can survive for up to 9 days on inanimate surfaces like plastic, metals, glass and fibres. It stands contagious for around three hours in air and up to 4 hours, 24 hours, 48 hours and 72 hours on copper, cardboard, steel and plastic respectively. Therefore, contaminated surfaces that are frequently contacted in healthcare settings act as a potential source of infection.[15]

Usually, root canal treatment requires a number of endodontic instruments and equipment, thereby reducing unnecessary hand contact with surfaces and equipment in the dental clinic can reduce the risk of fomite transmission.[16]

INFECTION CONTROL IN DENTAL SETTING

Infection control measures should address modes of transmission and persistence of the virus in the air and on the surface. Being compliant with the standard precautions is the prime rule, assuming each and every subject visiting the setting as a potential source of infection.

Telephonic triage: Telephonic triage should be made to all the patients in need of dental care based on their signs and symptoms. Effective pharmaceuticals and comprehensive home care guidance should be provided via teledentistry when dental treatment can be postponed.[17] Indian dental association (IDA) recommends teleconsulting, which is a wide range of technologies and tactics designed to deliver virtual medical, health and education services. Telehealth is not a particular program, but a set of means to strengthen the delivery of treatment and education. Teledentistry refers to the use of telehealth services and dentistry methodologies. During this pandemic, our goal as dental providers is to use telecommunications technologies to triage patients and perform problem-oriented assessments in order to restrict office visits to urgent or emergency treatment. This will promote the provision of advice and the success of triage.[18]

Waiting area: Social distancing, the new normal should be included in the dental practice. A poster or standee describing cough etiquette instruction should be placed at the entrance of the waiting area. The detailed instructions should include the correct use of tissue napkins to cover nose and mouth while coughing or sneezing and proper disposal of these napkins and other contaminated articles in the waste receptacles. Also, instructions should be provided to ensure adequate hand hygiene.[16] Ideally, patients can wear their own fabric facemask covering upon arrival at the hospital and during their stay. If they do not have a facemask covering, as resources allow, a facemask or fabric face covering can be provided to them. In the patient care area, patients can remove their cloth facemask cover, but they should put it back on when leaving at the end of the dental procedure.[17]

Hand hygiene: Proper hand hygiene is a prerequisite in destroying SARS-CoV-2, as soap and detergent break the outer fatty layer of the virus. Rubbing hands for at least 20 seconds will essentially dissolve the fat layer while the remaining protein molecule will dissolve on its own. Hand hygiene should be done before and after contacting the patient, before performing any aseptic procedure and after exposure to any body fluid.[19]

PPE: Personal Protective Equipment known as the PPE kit is a fundamental element that forms an effective barrier against the aerosols generated from the operative site and limits their transmission. Gowns/coverall shield the torso of healthcare providers. Coverall provides 360-degree protection as they cover the entire body while the isolation gown does not provide continuous full-body protection. The protection of mucous membranes in the eyes/nose/mouth by the use of face shields/goggles is an integral part of the standard precautions. The goggle frame protects the eyes and surrounding areas. It also acts as a barrier to droplets and splashes impacting the conjunctivae of the wearer.[20]

Surgical mask and respirators: Surgical masks are generally intended to protect healthcare workers from patients and vice versa. They act by minimizing the exposure to saliva and respiratory secretions. They are used to block large particles like droplets, splashes, sprays, or splatter containing microbes from reaching the nose and mouth. The most widely used filtering face piece respirators (FFRs) are the N95 respirators, which are disposable filtering face piece respirators that form tight seal against the face skin and have a particle filtering efficiency of around 95% or above for a median particle size. The United States National Institute for Occupational Safety and Health (NIOSH) classifies particulate filtering face piece respirators into following categories namely N95, N99, N100, P95, P99, P100, R95, R99, and R100. N means oil non-resistant, R means some resistance to oil and P depicts oil proof and the suffix 95, 99, and100 describe the filter's minimum filtration efficiency with 95%,99%, and 99.97%, respectively.[21]

FFRs are divided into three class in the European Standard (EN 149): FFP1, FFP2, and FFP3 where FFP stands for filtering face piece with filtering efficiency of 80%, 94%, and 99% respectively. They are categorized by inward leakage in laboratory experiments and simulated real-life applications which may result either from penetration through the face piece material matrix or through any space or gap between the face and face piece.[22] FFP1-Protect against coarse solid particles with no particular toxicity 2-P2 / FFP2-Protect against solid and/or liquid aerosols defined as dangerous or irritating 3-P3 / FFP3-Protect against harmful solid and/or liquid aerosols.[23]

Respirators mentioned below under 3M™ are comparable to N95 (US NIOSH-42CFR84) and are considered as feasible alternatives to N95.[24]

- FFP2 (Europe EN 149-2001)
- KN95 (China GB2626-2006)
- P2 Particulate respirator (1716:2012; 3M ™ Australia/New Zealand)
- Korea 1st class (Korea KMOEL-2017-64)
- DS (Japan JMHLW-Notification 214, 2018)

Pre-operative considerations: Povidone-iodine or chlorhexidine may be used to scrub the patient's lips and surrounding area to maintain an aseptic technique as done in other dental procedures which require aseptic technique.[25]

Pre-procedural use of 1.0% hydrogen peroxide or 0.2% povidone-iodine viricidal mouth rinse can be effective in eliminating oral and respiratory pathogens.[26] In a recent in vitro investigation, Bidra et al. concluded that the lowest PVP-I concentration of 0.5 percent with a contact time of 15 seconds successfully eliminated SARS-CoV-2.[27]

Intra-operative considerations: Dental healthcare workers can try to avoid any procedures that generate aerosols. They may also lay stress on the use of hand tools like spoon excavators and other caries removal agents based on chemo-mechanical mechanism. If such aerosol-generating procedures cannot be avoided due to any reason, the same should be performed at the end of the day.[12]

It is advised to work from 10 or 11 o'clock position ideally. The 8 o'clock position should be avoided, to keep away from splatter.[28]

To reduce the sterilization and disinfection protocol, it is always better to carry out single use instrumentation wherever possible.[25]

Limit the use of intraoral radiography wherever possible. Although in endodontics, this is unlikely to be feasible, because an accurate preoperative radiograph is required.[25]

The use of a rubber dam will significantly mitigate the contamination of saliva and blood, as it will provide a barrier to the primary source of infection.[25] During cavity preparation, the use of rubber dams has shown a substantial reduction in microorganisms spread by 90 %.[29] So, it should be mandatory for all operative and endodontic procedures.

A dental handpiece with high speed and without anti-retraction valves can aspirate and remove debris and fluids during dental procedures. To be more precise, the microbes can further contaminate the water and air tubing within the dental unit possibly resulting in cross-infection. The use of anti-retraction dental handpiece, as an additional prevention measure for cross-infection is highly recommended.[30]

To decrease surface contact of aerosol, ensure that high-volume suction is used as close to the tooth and the handpiece head as possible while drilling. It has been shown that the use of high-volume suction decreases aerosol surface pollution by 90-93%.[31]

Refrain as far as possible from the use of the 3-in-1 syringe. Using high-volume suction, debris accumulated inside the pulp system may be eliminated.[25]

Limit the use of ultrasonic scalers, which have high aerosol production.[32]

Post–operative considerations: With the paradigm shift in dental health practices, teledentistry has a significant role in the wake of the current COVID-19 pandemic. This makes it possible for the dentist to assess and record the dental status postoperatively without any conflict with the subjects. Bacteria particles and viruses can be detected in the air of dental operatory within 30 minutes of aerosol production.[32] Thus, waiting for half an hour in between two patients is recommended to prevent the microbial transmission both among dentists and to the next patient.[33]

Surfaces in close proximity of the dental operatory has to be disinfected after each patient visit. Surface disinfectant containing 62-71% ethanol, 0.5% hydrogen peroxide and 0.1% (1 g/L) sodium hypochlorite can efficiently inactivate infective pathogens.[34]

Adequate room ventilation critical in maintaining the optimum indoor air quality. The air purifiers with the filtration efficiency of 99.995% or more, for particles ≥ 0.01 µm, which at a virus size of 0.12 µm (120 nm) are highly effective. The air purifiers with high efficiency particulate air-14(HEPA-14) filters or higher is recommended.[35]

Working under negative air pressure would be preferable for procedures in which aerosol production is anticipated.[36]

CONCLUSION

COVID-19 has given dental practitioners new challenges and obligations. Transmission of COVID-19 in dental setting occurs primarily through aerosol; droplets, fomites and contact spread. Nosocomial infection through aerosol is a matter of concern for endodontists. In addition to the usual precautions, additional precautions should be taken to diminish the infection transmission by asymptomatic carriers. It is the responsibility of dentists to follow proper infection control protocols and measures for their patients, staff and themselves in order to curb the spread of infection in dental practise.

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REVIEW

QR CODE

The Potential Adverse Reactions of Administering Combination Therapy in Covid-19 Patients

VIKRANT KHULLAR

ABSTRACT

A definite treatment modality for coronavirus disease 2019 (COVID-19) has still not come into picture. With the rise of COVID-19 pandemic, a few drugs have come into light as empirical treatment for this infection. This review focusses on existing approaches to the treat COVID-19 patients with antimalarial drugs and antibiotics analyzing the adverse reactions and interactions of concomitantly administering these drugs. We will also discuss the possibilities of alternate methods to treat this disease.

KEYWORDS: Coronavirus, COVID-19, Anti-malarial, Hydroxychloroquine, Azithromycin

INTRODUCTION

The deadly coronavirus disease 2019 is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 has spread rapidly across the globe with countless confirmed cases deaths. The severity of COVID-19 is influenced by various factors such as age, gender, ethnicity, and comorbid conditions. Although many therapeutic treatments have been suggested, there is no approved antiviral treatment specific for COVID-19. Countless challenges associated with this pandemic has stressed the medical professionals to seek therapeutic strategies, including the use of well-researched drugs for new indications. Subjects with cardiovascular issues seem to be at an elevated risk of unfavorable outcomes in the COVID-19 infection.

The respiratory symptoms dominate in the clinical presentation of COVID-19, a few subjects may also have significant impairment of the cardiovascular system. In a published report on patients with COVID-19, 68% had at least one concurrent health issue, including hypertension, diabetes mellitus and other cardiovascular diseases.[1] There is a need to analyze and understand the safety of the therapeutic measures used in patients with COVID-19 due to the possible cardiac adverse effects of these drugs, keeping in mind that most of the infected subjects are aged and have more possibility of suffering from cardiovascular diseases. The progress in finding new therapeutic indications for the currently used drugs is advancing at a great pace and the active use of azithromycin with antimalarial drugs is being practiced globally. The main reason behind the use of this combination is rooted on the pathogenetic understanding of the possible mechanism of antiviral action of chloroquine and hydroxychloroquine. This is apparently based on blocking the penetration of virus into cells by inhibition of host cell glycosylation and endosomal acidification.

The analysis of established literature gives rise to apprehension about the broad use of this drug combination in COVID-19 patients. Chloroquine is an aminoquinoline derivative, initially used as an antiprotozoal drug. Its mechanism of action is associated with inhibition of nucleic acid synthesis in cells, and the drug has moderate immunosuppressive and anti-inflammatory effect. It is used for rheumatoid arthritis, systemic lupus erythematosus, autoimmune glomerulonephritis, sarcoidosis, and scleroderma. It also has an antiarrhythmic effect due to decreased excitability of the heart muscle. It has many contraindications like hypersensitivity, hepatic failure, renal failure, bone marrow depression, cardiac injury, rhythm disorder, neutropenia, psoriatic arthritis, porphyrinuria and pregnancy. The drug dosing restrictions are glucose-6-phosphate dehydrogenase deficiency, retinopathy, epilepsy, myasthenia, severe gastrointestinal disorders, and concomitant use of hepatotoxic agents. It also interacts with many drugs including cimetidine, penicillamine, phenylbutazone, cytostatics, levamisole, glucocorticoids, ethanol and cardiac glycosides. The gastrointestinal and skin

manifestations of this drug are considered to be non-serious adverse events, and retinal, neuromuscular, and cardiac toxicity are classified as serious adverse events.[2] Cardiac toxicity of the drug is well known and widely described in the literature, more commonly reported as cases of cardiomyopathy, cardiac rhythm disturbances and conduction impairment.[3-5] Another antimalarial drug is hydroxychloroquine, which also has anti-inflammatory and immunosuppressive effects in systemic lupus erythematosus and rheumatoid arthritis, which are registered as its official indications.

Hydroxychloroquine has cumulative activity, but side effects may occur relatively early. Cardiovascular side effects of chloroquine or hydroxychloroquine like cardiomyopathy, can lead to heart failure, may be fatal in some cases. Conduction disorders are the main side effect reported in patients who receive these drugs. Clinicians should be cautioned that cardiovascular side effects, even conduction abnormalities without severe consequences, associated with the use of chloroquine or hydroxychloroquine, may be initial toxicity manifestations and potentially irreversible.[6-8] Older patients undergo age-related physiological changes that are manifested in the changes of drug pharmacodynamics, potentially causing increased drug interactions and risk of side effects. Drug interactions and side effects associated with the use of antimalarial drugs in elderly may occur more frequently due to QT prolongation, decreased renal elimination, and decreased hepatic metabolism [9]. Hydroxychloroquine prolongs the QT interval and should not be prescribed in combination with other drugs that have the potential for cardiac arrhythmias. There is an increased risk of ventricular arrhythmias when hydroxychloroquine is used concomitantly with other arrhythmic agents.

The choice of antibacterial agent in favor of azithromycin in the COVID-19 treatment regimens in combination with chloroquine or hydroxychloroquine rises concerns about two aspects: increased risk of cardiac arrhythmic side effects and more frequently reported resistance to monotherapy with this drug, which may affect the pneumonia treatment effectiveness in a patient with COVID-19. In addition, the decrease in treatment effectiveness may be exacerbated by additional immunosuppression and depressed intrinsic immunity associated with the administration of antimalarial drugs such as chloroquine or hydroxychloroquine. Many studies suggest that macrolide therapy was associated with the risk of cardiac complications.[10-13] Mefloquine is another antimalarial drug developed in the USA in the early 1970s.[14] It has no cardiac side effects but has psychoneurological side effects.[15]

A systematic literature review to identify a critical assessment of further use of mefloquine in connection with the risk of psychiatric disorders and suicide risk did not reveal any critical comments supporting these risks in clinical practice for prophylactic use of mefloquine.[16] Another study conducted on mefloquine, along with cepharanthine and selamectin as a treatment for COVID-19 demonstrated that these drugs showed complete inhibition of cytopathic effects in cell culture.[17] Given the described drug interactions and possible side effects, clinicians should be vigilant in selecting optimal therapy on a case-by-case basis considering the presence of certain diseases and characteristics of particular patient. It should be remembered that patients with high viral load may develop myocarditis[18] as a consequence of direct viral toxicity to the myocardium and myocardial damage, as evidenced by studies of troponin level changes and prognosis in this population.[19] In this case, it should be noted that the prescription of drugs with cardiotoxicity should be limited. To reduce the risk of cardiotoxicity-related side effects, prior to drug prescription, a patient should be evaluated for the following conditions that contraindicate hydroxychloroquine like severe cardiac abnormalities, including significant rhythm and conduction abnormalities, chronic heart failure, cardiomyopathy, marked left ventricular hypertrophy, planned amiodarone or carbamazepine administration. The combination of azithromycin with mefloquine, rather than chloroquine/hydroxychloroquine, appears to be more grounded in terms of safety.

However, patients with previously reported ventricular tachycardia and/or significant QT prolongation should probably refrain from azithromycin. To control cardiotoxicity and safety of the conducted therapy, instrumental and clinical monitoring, including ECG monitoring is required prior to treatment and over time, in patients at high risk, and in patients with a history of cardiovascular diseases regardless of their age. The discussed antiviral drug therapy could be considered as a pathogenetically justified approach in the treatment of the novel coronaviral infection, but an effective antiviral drug with a clearly proven effect on COVID-19 has not yet been determined.[20] Antiviral drugs, remdesivir and favipiravir, currently being actively

studied in clinical trials in patients with COVID-19, are candidates for the potential use in clinical practice. In addition, intravenous immunoglobulin and donor convalescent plasma donated through plasmapheresis by the patients, who have had the infection, within 2 weeks of recovery and discharge, should be considered another pathogenetically justified strategy for the treatment of COVID-19. Despite all the struggles and hard work behind the research work focused on finding a gold standard treatment for COVID-19, there is no definite and specific outcome.

CONCLUSION

More in depth understanding of the mode of action of existing drugs against coronavirus with a focus on adverse events caused by them is required. Data on these drugs is very limited in context of COVID-19. Long term trials with large number of subjects need to be conducted to establish and document benefits of these drug combinations so that a significantly substantial evidence can be generated.

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CASE REPORT

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A Suspected Allergic Reaction to Boal Fish (Wallago Attu)

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ABSTRACT

Consumption of fish has increased around the globe due to its high nutritional value and this has led to an increase in incidence of allergic reactions to fish. Reactions to fish are not only mediated by the immune system causing allergies but are often also caused by proteins, metals, various toxins and parasites. Allergic reactions to fish can range from being mild and self-limiting to serious and life threatening. We report a case of an adult with suspected allergic reaction to Boal fish (Wallago Attu) who developed contact dermatitis during marinating process. Application of steroids and administration of oral antihistaminic led to a quick recovery.

KEYWORDS: Allergy, Contact Dermatitis, Parvalbumin

INTRODUCTION

Seafood has got a high content of nutrients mandatory for a good health. Fish has always been the staple food in coastal areas, but its consumption has risen tremendously worldwide. A large variety of international cuisines are available at eating joints and infinite cooking videos can be found online. Due to lockdown and work from home policies, during this COVID-19 time, countless people have inculcated the hobby of cooking. Seafood can provoke serious IgE antibody mediated adverse reactions in susceptible individuals.

Allery to fish seems to vary with eating habits, type of processing, and fish species. Different routes include ingestion, skin contact or inhalational. Although most allergic reactions to fish happen when someone eats fish, sometimes people can react to touching fish or breathing in vapors from cooking fish. Approximately, ten percent of subjects having allergy to seafood report more severe reactions caused by skin contact or inhalation than by ingestion.[2]

The major fish allergen characterized is parvalbumin in addition to several less well-known allergens. Common symptoms of fish allergy include hives, skin rash, nausea, stomach cramps, indigestion, vomiting, diarrhoea, runny nose, sneezing, headaches and are mild to moderate in severity. Less common symptoms like anaphylaxis and shock can be life threatening. Wallago Attu is a freshwater catfish of the family Sciuridae, native to Southeast Asia. It is commonly known as helicopter catfish, wallago catfish or the Bengal Boal and is one of the fish species that has been used for consumption in Southeast Asia since historic times.[2] We report a case of an adult with suspected allergic reaction to Boal fish. Written informed consent to publish this case report was obtained from the patient.

CASE REPORT

A 33-year-old male presented to us with a 24-hour history of redness and itching on the back of right hand accompanied with mild pain. The subject, a public health dentist by education, had been working as a pharmacovigilance scientist with a research organization since past 4 years with no contact with patients or dental material. Also, he had been working from home since March 2019 due to COVID outbreak ruling out any occupational exposure. There was no relevant medical history. He had been taking regular dose of chewable Vitamin C tablet and zinc supplements for 2 years and had not been exposed to any other medication since past few months. One day before presentation, while the subject was preparing dinner, he reported to have a sudden onset of redness and itching on back side of his hand accompanied with mild pain (Figure 1).

On detailing, it was brought to our notice that he had cooked boal fish and the rash appeared after marinating fish. Similar reaction had occurred to his wife who cooked same variety of fish a few days back but was self-limiting and was gone in a few hours. This reaction was thought to be unlikely due to ingredients used in marinating (corn flour, gram

Figure 1. Clinical Presentation

flour, ginger paste, garlic paste, curd, lemon, salt, red chilli powder) as the same were being used daily for other food preparations. Moreover, such reaction was not seen while marinating other fish varieties. The patient was frequently consuming the same type of fish, but never experienced this before. A diagnosis of fish induced allergic contact dermatitis was suspected and the subject was asked to get evaluation done for IgE sensitization and challenge testing to which he refused. The patient was prescribed fluticasone propionate ointment and paraffin containing emollient, both twice daily for 2 weeks and oral levocetirizine twice daily for first week followed by once daily for second week. He was also advised to abstain from fish and fish products. He showed up after 15 days for a follow up visit with resolution of symptoms (figure 2).

Figure 2. Resolution of Symptoms

DISCUSSION

We present a report of an adult with suspected boal fish induced allergic contact dermatitis. Sensitization can result not only by consuming fish but also by skin contact or by inhalation of vapors during processing of fish.[3] Allergic symptoms may vary from oral allergy syndrome, cutaneous involvement including angioedema, gastrointestinal symptoms such as nausea and vomiting, or anaphylaxis with respiratory and circulatory involvement.[4-6] Till date, allergens from many fish species have been described. Major allergen is parvalbumin which is a heat stable, calcium-binding protein present in the muscle of nearly all types of fish. Other fish allergens include aldolase, enolase, vitellogenin and tropomyosin. Cross-reaction can be seen among several types of fish, so once an individual becomes sensitized to parvalbumin, they tend to exhibit allergic reactions to other variety of fish as well.[7,8] Onesimo et al. reported a case of contact urticaria involving specific IgE antibodies to parvalbumin.[9] A recent experimental study demonstrated that the concomitant administration of antacids enhanced the IgE sensitization of mice to the major fish allergen parvalbumin.[10] In our case, it is likely that the patients' fingers were moist when handling fish, potentially creating an ideal environment for antigen proteins to be absorbed through the skin and eventually leading to percutaneous sensitization to fish.[11] Fish allergy might not be permanent in all affected subjects. As per the results of a surveyed sample in telephonic survey conducted by Sicherer SH, 3.5% of the subjects reported loss of that allergy.[12] Abstinence from the food causing allergy is an important rule of treatment. The duration of avoiding seafood until the tolerance attainment is not known but it probably varies widely and probably depends on many factors like onset age, reaction severity, magnitude of sensitization, type of symptoms and extent of avoidance.[13,14] However, the chances are bright that recurrence of intolerance might occur.[15]

The symptoms may be different at different exposures. Seitz et al reported a case of a truck driver in charge of seafood deliveries whose clinical symptoms of allergy gradually progressed from contact urticaria to generalized urticaria and later anaphylaxis and occupational asthma.[16] Affected subjects often report reactions to seafood when prepared in a certain way but not in another and this phenomenon might be attributed to possible contamination with another food allergen or additive. Activities like drying, salting, freezing, boiling or grilling might decrease or intensify the potential to cause allergic reactions. Cooking can sometimes affect tolerance as the allergenicity to certain fish proteins seems to decrease by heat.[17] But

this does not hold true always. Allergens in Seafood are usually heat stable and are not easily destroyed during cooking. Occasionally, some individuals seem to tolerate canned or tinned fish, but are not able to tolerate the same fish when freshly prepared. It has also been reported that storage conditions might impact the skin irritancy of fish as fish kept on ice for several days increases the severity and frequency of symptoms like erythema, stinging and itching.[18] The presumptive diagnosis of fish allergy can generally be made based on a precise clinical history combined with additional IgE testing, in vivo skin prick testing, in vitro quantification of IgE, immunoCAP, and confirmation by challenge testing unless the reactions borne by it are too severe or life-threatening.

A negative skin test result or in vitro test result should alert the physician to possible reactions to substances in fish other than fish protein allergens. Our subject was neither evaluated for IgE sensitization nor verified by means of challenge testing as he refused for the same due to untold reasons. Treatment is focussed on steroids, anti-histaminics, emollients and most importantly avoidance of allergens. This strategy led to complete resolution of symptoms in our patient.

CONCLUSION

Increased fish consumption has led to rise in incidence of allergy. Not much literature is available on allergic reactions due to skin contact with fish. Our patient with suspected boal fish induced allergic contact dermatitis was successfully treated with complete disappearance of symptoms. A detailed research is required on the molecular structures of fish allergens with emphasis on the immunological and clinical reactivity in order to improve the management of medically significant allergic reactions. The progress in the analysis of fish allergens will not only amplify our knowledge regarding the physiological basis of fish allergy but also set down the foundation for the evolution of diagnostic and therapeutic measures for allergic reactions triggered by these fish allergens.

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ORIGINAL RESEARCH

QR CODE

How Stressed are our Postgraduate Medical and Dental Postgraduate Students in Southern Asia? A Cross-Sectional Survey

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ABSTRACT

INTRODUCTION: Stress has been quite commonly reported in the literature among medical and dental students due to the nature of their work.
AIM: To assess the level of stress among medical and dental postgraduates in various medical and dental Colleges in Southern Asia.
MATERIALS AND METHOD: The study was cross-sectional in nature and conducted among 809 medical and dental postgraduates. Stress was measured using the Cohen's Perceived stress scale-14 (PSS-14) online through google forms (convenience sampling). Data was entered in MS Excel and descriptive statistics was applied followed by the independent samples t-test, post-hoc modified Bonferroni test and Odd's Ratio (OR) using SPPS version 22.0.8 Statistical significance was set at 5% ($p<0.05$).
RESULTS: There were 342 (41.3%) medical and 467 (58.7%) dental postgraduates. Most medical postgraduates (73%) reported stress as "severe", while among dental postgraduates, most of them(32.5%) reported having "mild" stress ($p=0.03$). Among both medical and dental postgraduates, the third year of their postgraduation was found to be most stressful and the association was found to be significant ($p=0.04$*, OR:1.5). Unmarried postgraduates among both groups reported having most stress and the association was non-significant (OR: 1.1).
CONCLUSION: Both medical and dental postgraduates are requested to practice stress relieving exercises and ask for help if the need arises so.

KEYWORDS: Stress, Survey, Medicine, Dentistry, Students

INTRODUCTION

Stress, a result of external physical and/or mental factors affects an individual's physical and psychological well-being and has been quite extensively reported in the literature among medical and dental students.[1,2] Examples of stresses associated among such students include time management, the technical as well as technique-sensitive/intensive nature of work, clinical (both pre-clinical and clinical), submitting time bound assignments and managing uncooperative patients.

Post graduate students who decide to pursue a certain speciality are further burdened with thesis/research work, seminars and journal club presentations apart from honing their clinical skills. Handling so many things (multi-tasking) at once can result in stress, which can further lead to depression, anxiety, substance misuse, absenteeism, diminished work efficiency, and burnout.[3-5] Various authors have reported a high levels of stress among medical students which ranges from 27% to 73%.[6]

Such stresses among students exhibit a directly proportional relationship between their year of study. With promotion into every year, the burden of work increases, and the shift from pre-clinical to clinical postings is a huge transformation for the students. Hence, the present study was undertaken with the aim to assess the level of stress among medical and dental postgraduates in various medical and dental colleges in in Southern Asia.

MATERIALS AND METHODS

The present study adopted a cross-sectional study design and was conducted from 1st October, 2019 to 31st January, 2020. As per the initial protocol, the study was to be conducted for a year, but due to the COVID-19 pandemic, data collection had to be stopped in between and the data collected as per the specified time above was taken into consideration. As per the study design, obtaining an ethical clearance was not necessary.

Stress among the postgraduates was measured using the Cohen's Perceived stress scale-14 (PSS-14)[7] and as per the study design, data was collected through convenience sampling. The questionnaire was distributed online through google forms and the link was distributed on various social media. They were informed that participation in the study was purely

voluntary and the confidentiality of their data was assured; and to ensure this, no personal data [name, e-mail id and phone number(s)] were collected.

PSS-14 Scoring: The questionnaire comprises of 14 questions with responses varying from zero (0) to four (4) for each item and ranging from zero (0) = never, one (1) = almost never, two (2) = sometimes, three (3) = fairly often and four (4) = very often (five-point likert scale) respectively on the basis of their occurrence during one month prior to the survey.

The scoring was calculated by obtaining the scores on four positive items and has a possible range of scores from 0 to 56.3. On the basis of the scores, stress was divided into the following categories: no stress (<14), mild stress (15-28), moderate stress (29-42) and severe stress (43-56). For further comparisons no stress was considered as stress absent and sum of mild, moderate and severe stress were considered as stress present.

Statistical analysis: Data was entered in MS Excel and descriptive statistics was applied followed by the independent samples t-test, post-hoc modified Bonferroni test and Odd's Ratio (OR) using SPPS version 22.0.[8] Statistical significance was set at 5% ($p<0.05$).

RESULTS

Demographic profile of the study subjects (Table 1)

The total number of respondents were 809 (100%), of which there were 342 (41.3%) medical and 467 (58.7%) dental postgraduates. More males (58.7%) were observed among medical postgraduates while an almost equal percentage of male (50.5%) and female(49.5%) dental postgraduates were observed. Most postgraduates belonged to the third year of postgraduation (medical: 54.1%, dental:55.6%) and were unmarried (medical: 73.2%, dental:86.5%) in both the groups (table 1).

	Medical PG Students	Dental PG Students
Gender		
-M	201(58.7%)	236 (50.5%)
-F	141(41.3%)	231 (49.5%)
Total	342(41.3%)	467(58.7%)
Year of PG		
-Ist	85 (24.8%)	111 (23.7%)
-IInd	72 (21.1%)	97 (20.7%)
-IIIrd	185 (54.1%)	259 (55.6%)
Marital Status		
-Married	95 (27.7%)	63 (13.5%)
-Unmarried	247 (72.3%)	404 (86.5%)

Table 1. Demographic Profile of The Study Subjects

Stress levels among medical and dental postgraduates as per PSS-14 scoring (Table 2)

It was observed that most medical postgraduates (73%) reported stress as "severe", while among dental postgraduates, most of them(32.5%) reported having "mild" stress. A significant association between reported stress was found between both groups ($p=0.03$, table 2).

Scores	Medical PG Students	Dental PG Students	value
No Stress (<14)	27(7.9%)	62 (13.3%)	0.03
Mild (15-28)	123(35.9%)	152 (32.5%)	
Moderate (29-42)	100(29.2%)	119 (25.9%)	
Severe (43-56)	92 (73%)	134(28.3%)	

Table 2. Stress Levels among Medical and Dental Postgraduates as per PSS-14 Scoring

Detailed distribution of stress among medical and dental postgraduates (Table 3)

In a detailed assessment of the responses, most stress was observed among medical postgraduates (58.5%), while similar stress percentages were found between males (49.3%) and female dental postgraduates (50.7%) and no statistical significance was found between the two specialities (OR: 1.3). Among both medical and dental postgraduates, the third year of their postgraduation was found to be most stressful and the association was found to be significant ($p=0.04$*, OR:1.5). Unmarried postgraduates among both groups reported having most stress and the association was non-significant (OR: 1.1).

DISCUSSION

The results of the present study revealed that most medical postgraduates (73%) reported stress as "severe", while among dental postgraduates, most of them (32.5%) reported having "mild" stress. In agreement, Sharma et al.,[9] reported a stress prevalence of 86% among medical postgraduates, while among dental postgraduates, stress was relatively general among all the groups of the study participants (Mathew et al.).[10]

In contrast, among medical postgraduates, varying prevalence of stress was found by Shete et al., (52%),[11] Malviya et al., (58.6%)[12] and Yusoff et al. (36.4%).[13] Among dental postgraduates, Shetty et al. found moderate to high levels of stress faced by post graduate students in their three years of training.[14]

	Medical PG Students		Dental PG Students		P value	OR
	Stress present	No Stress	Stress present	No Stress		
Gender						
M	184(58.5%)	17(62.9%)	199(49.3%)	37(57.8%)	NS	1.3
F	131(41.5%)	10(37.1%)	204(50.7%)	27(42.2%)		
Total	315(100%)	27(100%)	403(100%)	64(100%)		
Year of PG						
Ist	84(26.6%)	3(11.2%)	146(36.2%)	21(32.8%)		
IInd	76(24.2%)	9(33.3%)	101(25.1%)	19(29.7%)	0.04*	1.5
IIIrd	155(49.2%)	15(55.5%)	156(38.7%)	24(37.5%)		
Marital Status						
Married	74(23.4%)	21(77.7%)	49(12.2%)	21(32.8%)	NS	1.1
Unmarried	241(76.5%)	6(22.3%)	354(87.8%)	43(67.2%)		

Table 3. Detailed Distribution of Stress Among Medical and Dental Postgraduates (NS: Non-Significant)

It was observed that male medical postgraduates (58.5%), reported most stress, while among dental postgraduates, female dental postgraduates (50.7%) reported a marginally greater stress. This is lower in comparison to Chandan et al. (93.75% stress among males)[15], and in partial agreement to Malviya et al., (45.8% in males) among medical postgraduates.[12]

Among dental postgraduates, our findings were supported by Chacko et al.[16] who reported that a majority of the PGs in the speciality of Orthodontics and dentofacial Orthopedics were definitely stressed, with females being more stressed than males, though the difference between two genders were non-significant.

In the present study, unmarried postgraduates showed lesser stress in comparison to their married counterparts and these findings are in disagreement to Chandan et al.,[15] who reported 100% stress among married medical postgraduates as well as Manpreet et al.[17] We hypothesize that married people cope up with stress better as compared to their unmarried counterparts due to the increased ability to adapt to stress (due to increased responsibilities) after marriage.

This study is prone to limitations. The first being social desirability bias and second being the under/over reporting of data by the respondents, and to minimize its occurrence, no personal data was collected from the postgraduates. We safely state that the results of the present study can be generalized for postgraduates in South Asia and recommend that the workload of these postgraduates be reduced without affecting their learning by the institute.

CONCLUSION

The present study reported a high level of stress among medical postgraduates and apart from institute led initiatives to reduce stress, both medical and dental postgraduates are requested to practice stress relieving exercises and ask for help if the need arises so.

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ORIGINAL RESEARCH

QR CODE

Knowledge and Practice of Breast Cancer Screening and Awareness of Its Risk Factors Among Reproductive Women of Jammu and Kashmir

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ABSTRACT

INTRODUCTION: Breast cancer is the most common type of malignancy among women worldwide, therefore, it becomes necessary to understand the breast cancer literacy among women. Breast cancer literacy includes knowledge of breast cancer screening, practice of breast cancer screening and awareness of breast cancer risk factors.
OBJECTIVES: To determine level of awareness and practice of breast cancer screening, to assess level of awareness of breast cancer risk factors and to establish role of demographics in uptake and knowledge of breast cancer screening.
MATERIALS AND METHOD: In this study, reproductive women were taken and questionnaires given were filled by 381 respondents. Relevant questions were asked keeping in view the objectives. Role of age and maximum education of women was also established.
RESULTS: It was found that majority of women who were aware of breast cancer screening belonged to age-group 21-30 having mean of 56.19% and also showed higher practice of the same as compared to others (mean=50.1%) followed by women belonging to age-group 31-40 whose knowledge mean came out to be 25.5% and mean of practice was found to be 35.26%. The other two age groups of 15-20 and 41-45 showed low knowledge and less practice of breast cancer screening. Similar results were found out for other parameter.
CONCLUSION: Women whose maximum education was graduate and above showed higher level of awareness of breast cancer screening and risk factors and also higher practice of breast cancer screening as compared to women who had lower educational background.

KEYWORDS: Breast Cancer, Screening, Awareness, Risk Factors, Demographics

INTRODUCTION

Breast cancer is considered to be the most frequently occurring malignancy in the world, however in about 70-80% of cases, it is curable if diagnosed in early stage. Currently available treatments of breast cancer do not help if tumor has spread to other distant parts of body.[1] In females worldwide, breast cancer is the most commonly occurring cancer and out of all other cancers, it is the second most commonly occurring cancer. In 2018, over 2 million new cases of breast cancer were registered.[2] There are certain screening methods such as mammography, self-breast examination and clinical breast examination, that are useful in detecting breast cancer in early stages and thereby are beneficial in improving women's health.[3]

Findings show that patient delay in seeking help, making treatment less effective and minimal survival rate is associated with low awareness among women about symptoms of breast cancer, prevention strategies, risk factors of breast cancer and available treatments.[4] Studies indicate that women show low participation in breast cancer screening and it is due to their poor awareness of breast cancer screening.[5] Low and middle-income countries that lack proper screening programmes on national level have considerably low cancer screening awareness and participation as compared to countries that have proper national level screening programmes.[6] Certain studies have concluded that programs on breast cancer screening for early diagnosis and treatment have led to increase in survival rate and therefore have helped in preventing the recurrence and mortality. Mammography, Breast Self-Examination (BSE) and Clinical Breast Examination (CBE) have crucial roles to play in early diagnosis.[7]

There are certain risk factors of breast cancer which include age, family history and genetic factor, gender, race, early menarche, late menopause, reproductive history, dense breast tissue, certain genome changes, obesity, alcoholism, exposure to radiation, poor breast feeding and lifestyle.[8] There are low levels of awareness regarding breast cancer which leads to late diagnosis of the disease and therefore high mortality rate among women due to breast cancer. Other factors that lead to diagnosis at advanced stage of breast cancer are inconvenient and unmanageable referral pathways to diagnosis, not enough access to effective treatment at regional cancer centres and incomplete treatment regimens.[9] In India, there is a high incidence and high

mortality due to breast cancer, therefore, it becomes essential to understand the level of cancer literacy especially since the average age of diagnosis is 10 years younger than women in Western countries.[10] In order to draft out comprehensive and effective health programmes and treatment campaigns for early detection of breast cancer, the pre-requisite is to assess the existing levels of cancer awareness and practice among the masses.[11]

MATERIALS AND METHOD

Research design: This study used a cross-sectional survey research design. This design was preferred in to obtain diverse information about women's knowledge, awareness and practice related to breast cancer screening uptake and their awareness regarding the risk factors of breast cancer using questionnaire. It was also flexible, easy to administer and cheaper in data collection. In this study, information about the factors that influence early screening for breast cancer among the women of reproductive age using questionnaire was collected. This study was carried out in the area of Jammu & Kashmir and the target population was the women of reproductive age, that is, women aged between 15-45 years.

Sampling procedure and size: The women were picked by simple random sampling from Jammu and Kashmir until the desired sample size was attained.

The sample size of this study was calculated using Cochran's Formula which is given as follows:

Sample size for infinite population, $n_o = z^2pq/e^2$

Z score= 1.96, p=population proportion(0.5), q= (1-p), e= margin of error(0.05)

$n_o = (1.96)^2(0.5)(0.5)/(0.05)^2$

$n_o = 385$

After calculating the sample size of finite population, we used modified Cochran's formula to calculate sample size of infinite population whose formula is given as under:

Sample size for finite population, $n = n_o/1 + (n_o-1)/N$
$n = 387$

Therefore, the questionnaire was sent to 387 women of desired ages as per convenience, out of which 381 women responded back. Out of 381 women, 16.4% were of the age group 15-20, 51.4% belonged to the age group of 21-30, 19.9% women were of the age group 31-40 and 12.3% belonged to 40-45 age group.

Research instrument: Structured and close-ended questionnaire was used in the study which was constructed from the objectives of the study. This ensured that each question was related to a specific objective. Considerations were made for how information obtained from each question was to be analyzed. The questions were concise, in a logical sequence and with adequate information.

Data collection: Source of data was primary in nature. It was collected using close-ended questionnaires. The type of data gathered included- knowledge and practice of breast cancer screening, awareness of breast cancer screening, awareness of the risk factors of breast cancer and demographic factors.

Data analysis: The data collected was analyzed using statistical analysis in MS Excel.

RESULTS

In the present study, a pre-tested and pre-validated questionnaire was administered to 387 participants out of which 381 responded making the response rate 98.4%. The results obtained were divided into four sections which are as under:

Demographic characteristics of the participants:
Demographic information provides data regarding research participants and is necessary for the determination of whether the individuals in a particular study are a representative sample of the target population for generalization purposes. Demographic characteristics include age, gender, employment, birth and death rates, education, etc. Two demographic characteristics have been taken into account for this study. They are:

- Age of the respondents.
- Education of the respondents

Age of respondents: The participants were asked to mention the age group in which they lie so as to establish an understanding of the role of age in the knowledge, practice of breast cancer screening and awareness of its risk factors. Figure 1 illustrates the age groups of the respondents, majority being those ones falling between the age group 21-30 years at 51.4% followed by the ones aged between 31-40 years at 19.9%

followed by women of age-group 15-20 comprising of 16.4% and lastly at 12.3% are those ones aged between 40-45 years.

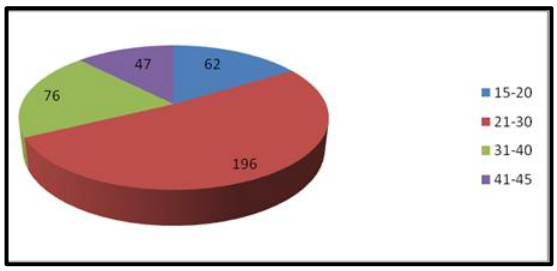

Figure 1. Age of the Respondents

Education of the respondents: Figure 2 depicts the maximum education of the respondents in which 80.8% are graduate or above, 15.1% have studied till higher secondary, 2.7% had studied till primary level and 1.4% comprised of participants that have studied till middle school.

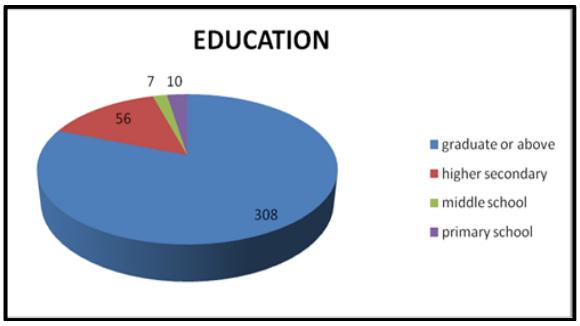

Figure 2. Maximum Education of the Respondents

Knowledge outcome of breast cancer screening: In order to assess this objective, relevant questions were asked to the respondents and responses were evaluated. There were seven questions on knowledge of breast cancer screening and the summary of correct and incorrect answers is given in table 1.

As per the study, 84.9% of the respondents knew that breast self- examination is a useful tool for early detection of breast cancer whereas 15.1% of the respondents responded otherwise which implies that a considerate amount of respondents knew about BSE. Further questions were asked to explore their knowledge about the same. While doing so, it was found out that only 30.8% of the participants knew the correct age to start BSE while others opted for the wrong answer. Moving on, only 42.5% of the respondents knew how often should BSE be done which implies that not even half of the participants knew the right answer. Another important aspect of BSE is to know the best time to do it. Correct answer to this question was given by merely 14.4% while the other 85.6% of the respondents had no clue about it. It depicts that a handful of respondents knew the correct time to do BSE which clearly points out that they do not practice BSE and even if they do practice.

Additionally, knowledge about clinical breast examination was also explored and it was found out that only 14.4% of the respondents knew that it is done using hands. The ideal frequency by which CBE should be done is yearly, however only a small fraction of 38.4% of the respondents knew the correct answer. Mammography is another screening method for the detection of breast cancer. The correct age to start mammography should be known by all women. However, only 17.1% of the women knew the right age to start mammography.

Practice outcome of breast cancer screening: The participants were asked about the practice of breast cancer screening and their responses were recorded. Out of the total lot, only 29.2% of the respondents practiced BSE and that too majority (45.8%) practiced it rarely and 38.1% practiced it occasionally. As far as practicing CBE is concerned, a small fraction of 6% practiced CBE which is an extremely low number and when asked about the reason for not practicing it, majority of the women accepted that they had never heard about it before which shows that there is little awareness among the masses. Table 2 sums up the response rates of practice of breast cancer screening.

Awareness outcome of breast cancer risk factors: Relevant questions were posed to the participants and their responses were recorded and assessed. One of the risk factors of breast cancer is to bear child after the age of 30 years and the percentage of participants who knew it was merely 16.4%. Another risk factor of breast cancer is wrong diet and only 21.9% of the participants agreed to it, while the rest believed that diet has no role to play in the development of breast cancer. It is a well-established fact that breast cancer can be acquired via heredity, however when this question was posed to the respondents, a major chunk (74.7%) of the respondents believed otherwise. Another risk factor of developing breast cancer is the early onset of menstrual cycle and late menopause. 76.7% of the respondents thought of this statement as false. One of the most important risk factor of breast cancer is that any previous treatment

KNOWLEDGE ITEMS	CORRECT RESPONSE	INCORRECT RESPONSE
K1. **Breast self examination is a useful tool to detect breast cancer**	84.9%	15.1%
K2. **Correct age to start breast self examination**	30.8%	69.2%
K3. **Breast self examination should be done how often**	42.5%	57.5%
K4. **Best time to do breast self examination**	14.4%	85.6%
K5. **Clinical breast examination is done using**	14.4%	85.6%
K6. **Clinical breast examination should be done how often**	38.4%	61.6%
K7. **Age to start mammography**	17.1%	82.9%

Table 1. Summary of Knowledge Assessment on Breast Cancer Screening among the Reproductive Women (n=381)

PRACTICE ITEMS	YES	NO
P1. **Practice of breast self examination**	29.2%	70.8%
P2. **Practice of clinical breast examination**	6%	94%

Table 2. Summary of Practice Assessment on Breast Cancer Screening among the Reproductive Women (n=381)

using radiation therapy and only 39% of the participants agreed to this statement. Table 3 depicts the percentage of responses towards the knowledge of risk factors of breast cancer.

AWARENESS OF RISK FACTORS	CORRECT RESPONSE	INCORRECT RESPONSE
A1. Bearing first child after age of 30 years	16.4%	83.6%
A2. No role of diet in the development of breast cancer	21.9%	78.1%
A3. Breast cancer can be acquired via heredity	25.3%	74.7%
A4. Menarche in early age and menopause in late age	23.3%	76.7%
A5. Any previous treatment like radiation therapy	39.1%	69.9%

Table 3. Summary of Awareness on Breast Cancer Screening among the Reproductive Women (n=381)

Role of demographic factors on the knowledge and practice of screening for breast cancer: To begin with, the knowledge of breast cancer screening was evaluated and their respective means were calculated and it was found out that majorly the correct responses that were given to the questions were by the age groups of 21-30 with mean 56.19% followed by age group 31-40 with mean 25.5% whereas other two age-groups, i.e., 15-20 age group having mean 13.83% and 41-45 age group having mean knowledge of 4.48% showed extremely low knowledge about breast cancer screening. Similarly, mean calculated for practice of breast cancer screening was highest in the age group 21-30(mean=50.1%) followed by age group 31-40(mean=35.26%). Least practice was shown by age group 15-20 having mean 14.23% followed by age group 41-45 having mean 0.41%. The role of education was also established and it was found out from their respective means that majorly the correct responses about knowledge of breast cancer were given by respondents whose maximum education is graduate or above(mean=82.75%) followed by respondents who had maximum qualification of higher secondary (mean=10.11%). However, low knowledge of breast cancer screening was found among respondents whose maximum qualification was middle school(mean=3.7) and primary school(mean=3.44%) (Table 4).

DISCUSSION

Breast cancer is currently the most commonly occurring cancer globally and continues to remain a worldwide public health issue.[12] Recently, questions regarding the effective use of cancer screening have come forward, as scientists, clinicians, and other experts weigh the extent to which harms of screening may outweigh the benefits.[13] Breast cancer awareness is the need of the hour. The most important step towards breast cancer awareness is to create awareness about its screening among the masses.

PARAMETERS	MEAN	
	KNOWLEDGE	PRACTICE
AGE (In Years)		
15-20	13.83%	14.23%
21-30	56.19%	50.1%
31-40	25.5%	35.26%
41-45	4.48%	0.41%
MAXIMUM EDUCATION		
Primary School	3.44%	0.00%
Middle School	3.7%	0.45%
Higher Secondary	10.11%	5.95%
Graduate or Above	82.75%	93.6%

Table 4. Mean of Total Score of Knowledge and Practice among the Reproductive Women

In this study, the very first objective was to determine the level of awareness about breast cancer screening among the women of reproductive age. Many findings showed that awareness about breast cancer risk factors was poor among women. As per a published report, only 31% of women from urban areas had knowledge of well-known risk factors for breast cancer, many women in urban areas had lower income levels.[14] Other studies have consistently found poor knowledge of risk factors among Asian women.[15,16] We analyzed same aspect in our study and in order to assess this objective, relevant questions were asked to the respondents and responses were evaluated. As per the study, 84.9% of the respondents knew that breast self- examination is a useful tool for early detection of breast cancer while as 15.1% of the respondents responded otherwise which implies that a considerate amount of respondents knew about BSE. However, only knowing about BSE is not enough. Therefore, further questions were asked to explore their knowledge about the same. While doing so, it was found out that only 30.8% of the participants knew the correct age to start BSE while others opted for the wrong answer. Moving on, only 42.5% of the respondents knew how often should breast self examination be done which implies that not even half of the participants knew the right answer. Another important aspect of BSE is to know the best time to do it. Correct answer to this question was given by merely 14.4% while the other 85.6% of the respondents had no clue about it.

Respondents were asked relevant questions about clinical breast examination so as to check their level of awareness about it. One of the most important factor of clinical breast examination is to know the equipment to do it. It is done using hands and when this question was posed to the respondents, only 14.40% of the women knew the right answer which implies that a very small fraction of women must have practiced CBE. The ideal frequency by which CBE should be done is yearly, however only a small fraction of 38.4% of the respondents knew the correct answer. Mammography is another screening method for the detection of breast cancer. The correct age to start mammography should be known by all women. However, only 17.1% of the women knew the right age to start mammography.

The second objective of this study was to assess the level of practice of breast cancer screening among the women of reproductive age. One finding shows that practice of BSE, CBE, and mammography was 38.4, 25.2, and 12 %, respectively. Over the six different domains of the health belief model, the mean score of perception of susceptibility was lower, which is interpreted as indicating that study participants feel less vulnerable to breast cancer risk.[17] Participants were asked about the practice of breast cancer screening and their responses were recorded. Out of the total lot, only 29.2% of the respondents practiced BSE and that too majority (45.8%) practiced it rarely and 38.1% practiced it occasionally. As far as practicing CBE is concerned, a small fraction of 6% practiced CBE which is an extremely low number and when asked about the reason for not practicing it, majority of the women accepted that they had never heard about it before which shows that there is little awareness among the masses.

Third objective of this study was to evaluate the level of awareness of the risk factors of breast cancer. Regarding to the awareness of breast cancer risk factors roughly half of our study samples had poor knowledge and only 14.8% of subjects had high level of knowledge.[17] One of the risk factors of breast cancer is to bear child after the age of 30 years and the percentage of participants who knew it was merely 16.4%. Another risk factor of breast cancer is wrong diet and only 21.9% of the participants agreed to it, while the rest believed that diet has no role to play in the development of breast cancer. It is a well-established fact that breast cancer can be acquired via heredity, however when this question was posed to the respondents, a major chunk (74.7%) of the respondents believed otherwise. Another risk factor of developing breast cancer is the early onset of menstrual cycle and late menopause. 76.7% of the respondents thought of this statement as false. One of the most important risk factor of breast cancer is that any previous treatment

using radiation therapy and only 39% of the participants agreed to this statement.

Also, demographic factors were assessed and their role was established. Differences in rate of advanced or metastatic breast cancer by ethnicity and socioeconomic status may be due, in part, to delays in responding to breast symptoms which may differ between ethnic and socioeconomic groups. Such differences occur because of differences in access to care or due to patient factors which include health literacy, health seeking behaviors or psycho-social factors.[18] In our study, the knowledge of breast cancer screening was evaluated and it was found out that majorly the correct responses that were given to the questions were by the age groups of 21-30 and 31-40 while as other two age-groups, i.e., 15-20 and 41-45 did not know the correct answers and showed extremely low knowledge about breast cancer screening. Same results were found for the other two parameters, i.e., practice of breast cancer screening and awareness of its risk factors.

The role of education was also established and it was found out that majorly the correct responses were given by women who had the qualification of graduate or above followed by respondents who had maximum qualification of higher secondary. However, no illiterate respondent or respondent having maximum qualification of primary school, middle school and high school knew any of the correct answer which can be seen as an alarming situation.

CONCLUSION

The results obtained from this study provide important baseline information about the awareness of breast cancer screening and its risk factors both of which are quite low. The results have also shown low practice of breast self-examination, clinical breast examination and mammography by the women of reproductive age. Demographic factors also have an impact on the knowledge and screening of breast cancer as women who do not possess enough qualification and lie in a certain age group (15-20 & 41-45) were found to be least informative about breast cancer and did not practice breast cancer screening either. Such information may be used to develop tailored education programs on breast cancer, increased primary and secondary prevention efforts. As can be inferred from this study, the knowledge of breast cancer screening, its practice and the awareness of breast cancer risk factors are extremely low and it is required to take necessary steps so as to increase the same among the masses. For breast cancer, primary prevention includes educating women on breast cancer risk factors which according to this study is not up to the mark especially in the age-group of 15-20 and 41-45 and in women with low qualification background.

Recommendations:

-Home-to-home campaigns are the need of the hour especially for women with low qualification background.
-Women falling in the age-group of 41-45 should be given special attention and should be imparted with extensive knowledge of breast cancer.
-School curriculums should be framed in such a way that young children can learn about breast cancer, its management and its risk factors.
-Vulnerable women should be identified and periodic screening should be done so as to detect breast cancer in its early stage.
-Social media should be widely used to spread awareness about the risk factors, screening and diagnosis of breast cancer.
-The word of available diagnostic facilities should be spread through various mediums among one and all so that women can avail those facilities.

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ORIGINAL RESEARCH

QR CODE

Oral Health Status of Institutionalized Orphans and Non-Orphans Aged 6-12 Years in a Central Indian City: A Comparative Study

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ABSTRACT

INTRODUCTION: Oral Health, like general health, is a basic fundamental right for all, and even more so for the underprivileged.
AIM: To evaluate the oral health status of Institutionalized orphans aged 6-12 years and non-orphans in Indore, Madhya Pradesh
MATERIALS AND METHOD: The present descriptive cross-sectional study was conducted among various registered orphanages in Indore, Madhya Pradesh. Oral Examination was done by two standardized examiners (ADA type III examination) and data was entered using a pre-tested and pre-validated proforma. Data was transferred into MS excel and after application of descriptive statistics, the independent samples t-test and multiple logistic regression were applied (p value significant at ≤ 0.5).
RESULTS: Of the total 263 study subjects, there were 132(50.2%) orphans and 131(49.8%) school children aged 6-12 years. Among orphans, males (62.9%) formed the majority; use of toothbrush with toothpaste was observed among 69.7% of orphans, while 6.1% did not use any oral hygiene aid. The most common observed hard lesion was dental caries (31.8%) as compared to 20.6% in school children and its presence revealed a significant association (p=0.02).
CONCLUSION: It is recommended that a special emphasis should be made to promote oral health among the children residing in orphanages.

KEYWORDS: Orphans, Dental Caries, Toothbrushing

INTRODUCTION

Oral health, a basic human right for people is necessary for having a healthy and a good quality of life.[1] Even in this ever progressing world, due to social and financial factors, oral care remains more focused on treatment than on prevention.[2] It is said that oral health is an integral part of general health; and its neglect results in negative/undesirable health and social consequences.[3]

In many low-income/developing countries, dental caries still is a major problem with limited access to oral health and teeth are often left untreated or are extracted because of pain.[4] Among such populations, orphans are at a high risk of having and/or developing dental diseases. Reasons for residing in an orphanage can vary from parental neglect, absence, substance abuse to abandonment (undesired child) and are at risk for developing abnormal psychosocial development.[5]

Various authors have documented the fact that oral health issues are more prevalent among deprived groups including orphans of both developing and developed countries.[6] In addition, children living in an orphanage are at a risk to develop nutritional deficiency as a result of which malnutrition, anemia, and delays in growth are observed among them.

Due to the neglected oral health among orphans, the present study aimed to evaluate the oral health status of Institutionalized orphans aged 6-12 years and non-orphans in Indore, Madhya Pradesh and the application of this data for the betterment of oral care among orphans, if required.

MATERIALS AND METHOD

The present descriptive cross-sectional study was conducted among various registered orphanages in Indore, Madhya Pradesh from 25th September, 2018 to 24th September, 2019 and after taking due approvals/permissions (including ethical approval) from the concerned authorities.

Data was collected using a proforma and entered by two standardized operators as per the directions of two investigators [also standardized before the study; Inter examiner variability (k): .071] who conducted an ADA type III examination under natural/ artificial light (based on availability).

All respondents and their caretakers were assured of the confidentiality of their data and data was coded and only available with the primary investigator. Data was

transferred into MS excel and after application of descriptive statistics, was transferred to SPPS version 16.0 and the independent samples t-test and multiple logistic regression was applied keeping the p value significant at ≤ 0.5

RESULTS

It was observed that of the total 263 study subjects, there were 132(50.2%) orphans and 131(49.8%) school children aged 6-12 years. Among orphans, males (62.9%) formed the majority and matched male school children (59.5%) were recruited for the present study (table 1).

	OPRHANS	SCHOOL CHILDREN
Males	83 (62.9%)	78 (59.5%)
Females	49 (37.1)	53 (40.5%)
Total	132 (50.2%)	131 (49.8%)

Table 1. Distribution of Orphans and School Children

The oral hygiene aids used by the children is shown in table 2. Use of toothbrush with toothpaste as observed among 69.7% of orphans, while 6.1% did not use any oral hygiene aid. Among school children, a majority of them (97.7%, p=0.03) used toothbrush with toothpaste and only 2.3% reported using a finger with a toothbrush.

Oral Hygiene Aid used	Orphans	School Children	p-value (derived from t)
None	8 (6.1%)	0 (0%)	NS
Chew Stick/Neem stick/Charcoal	16 (12.1%)	0(0%)	NS
Toothpaste and Finger	16 (12.1%)	3(2.3%)	NS
Toothpaste with toothbrush	92 (69.7%)	128(97.7%)	0.03
Total	132	131	00

Table 2. Use of Oral Hygiene Aids by Orphans and Children (NS: Non-Significant)

Table 3 describes the presence of hard and soft lesions among both groups. In orphans, the most common observed hard lesion was dental caries (31.8%) as compared to 20.6% in school children; the difference was found to be significant (p=0.05). Among schoolchildren, "other" hard lesions were majorly found (37.5%). It was observed that 48.5% of orphans and 77.3% of school children did not have any soft tissue lesion(s) and among ones observed, both groups showed a maximum number of coated tongue(orphans: 19.6%, School children: 10.7%) and statistical analysis of soft tissue revealed no significant association.

The multiple linear regression model to analyze the difference between hard and soft tissue lesions in relation to both groups revealed a significant association between hard tissue lesions (p=0.02, table 4).

DICUSSSION

As per findings of the present study, it was reported that both use of improper oral hygiene aids as well as presence of hard and soft tissue lesions were more prevalent among orphans as compared to non-orphans and this can be attributed to the individualized care provided by the parents of non-orphans, as compared to orphans, who are under the guidance of a caretaker are usually socially and economically deprived.[7]

More orphan males (62.9%) were observed among the orphanges surveyed in the present study, and this is in agreement to the findings of Soni A et al. (65.37% males)[8] and Shah AF et al. (72.2.% males).[9] However, in disagreement, to our findings, Bennadi D et al.[6] documented a higher percentage of institutionalized female orphans (83%) and the variations in the above findings can be attributed to the time at which the studies were conducted, as well as due to geographic locations of the orphanages.

The use a toothbrush and toothpaste in the present study was reported as 69.7% among orphans and 97.7% among non-orphans. This is lower as per the findings of Hans R et al. (82%)[10] and Kumar APP et al.,[11] who reported 90.8% brushing habit using toothbrush and toothpaste among orphan children. Among school children 97.7 % reported brushing habit using toothbrush and toothpaste and is in agreement to Mishra A et al. who reported 97.1% of their study population (school going children) using toothpaste as the medium for cleaning teeth, while the rest 2.9% used powder/charcoal and its products to clean the teeth.[12]

A positive finding of the present study was that dental caries was reported only in 31.8% of orphans and 20.6%

HARD TISSUE FINDINGS	ORPHANS	SCHOOL CHILDREN	P-VALUE (DERIVED FROM T)
HARD TISSUE FINDINGS			
Dental Caries	42 (31.8%)	27(20.6%)	0.05
Fluorosis	16(12.1%)	18(13.7%)	
Tooth Fracture	39(29.5%)	3(2.3%)	
Others	12(9.1%)	34(25.9%)	NS
None	23(17.5%)	49(37.5%)	
	132(100%)	131(100%)	
SOFT TISSUE FINDINGS			
Apthous Ulcer	12(9.1%)	07(5.3%)	
Coated Tongue	26(19.6%)	14(10.7%)	
Fissured Tongue	04(3.0%)	01(0.7%)	
Partial Ankyloglossia	1(0.8%)	0(0%)	
Bifid Tongue	1(0.8%)	1(0.7%)	NS
Others	24(18.2%)	7(5.3%)	
None	64(48.5%)	101(77.3%)	
	132(100%)	131(100%)	00

Table 3. Distribution of Hard Tissue Findings in Orphans and School Children

non-orphans. This is in partial agreement to Shah AF et al. (25.2%; orphans aged 7-11 years).[9] These findings are in agreement to those found among Mexican schoolchildren (49.4%; school children aged 6-13 years).[13] In disagreement, a higher caries was reported by Shingare P et al.[14] (88.61% among school children aged 7-10 years and 73% among school children aged 11-14 years) and among Orphans, 80% of caries prevalence was reported by Bennadi D et al.[6] Such variations can be attributed to individual beliefs (especially parents) and the self-motivation regarding oral hygiene among caretakers of orphanages.

Fracture of the tooth was reported to be 29.5% as compared to 2.3% among non-orphans and this high percentage among orphans is similar to the findings of Bennadi D et al. (22%) and is a resultant of higher oral neglect and monetary constraints in orphanages.[6] A bivariate logistic regression revealed a significant observation between hard tissue lesions among orphans and non-orphans (p=0.02*).

	Hard Tissue Findings	Soft Tissue Findings
Orphans * School children	0.02*	NS

Table 4. Association Between Hard Tissue and Soft Tissue Findings Between Both Groups

CONCLUSION

Based on the findings of the present study, it is recommended that a special emphasis should be made to promote oral health among orphanages and affordable/free treatment be provided to the children so that they can also restore their smile for life.

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