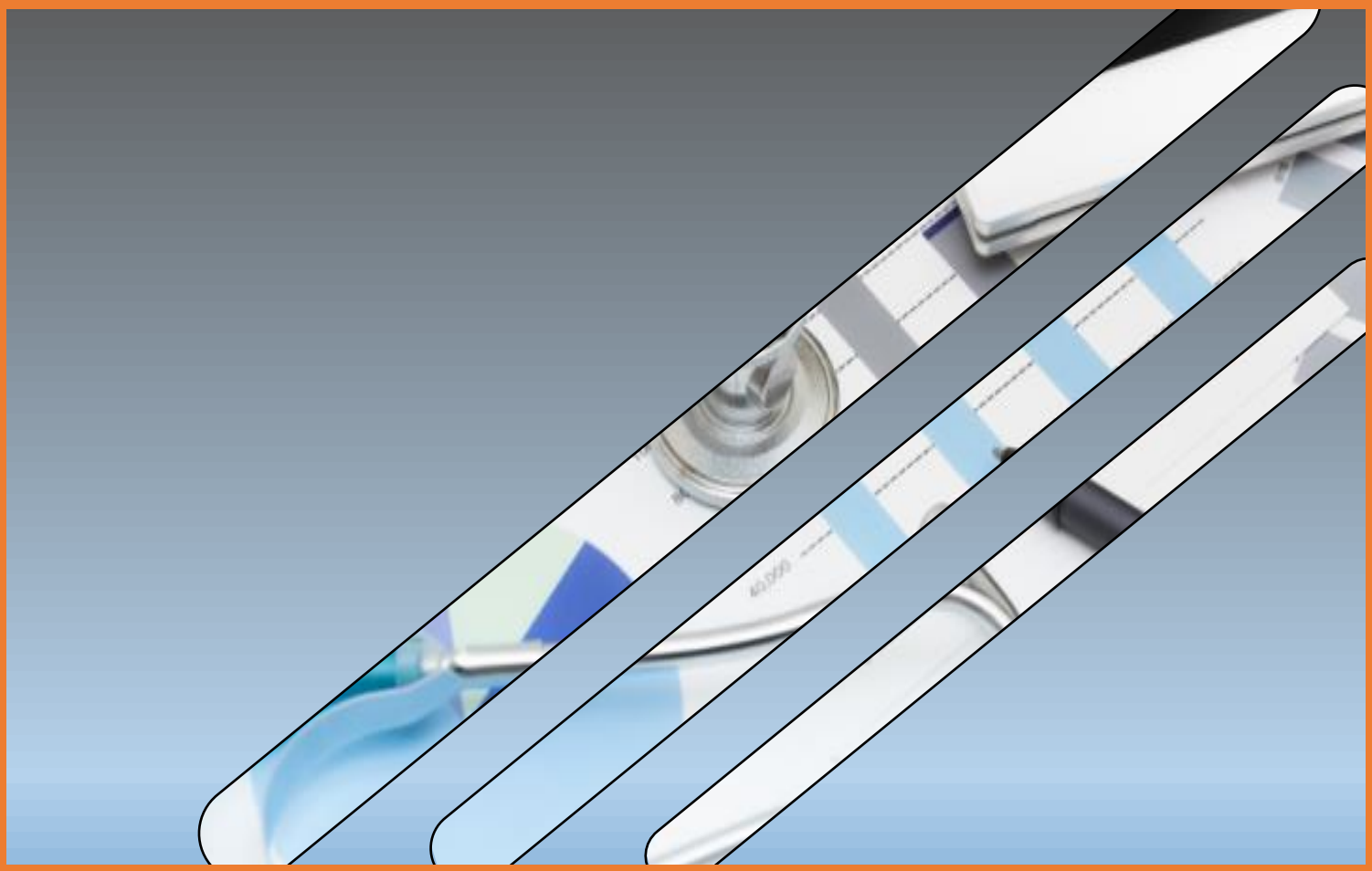

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Time to be Alert!! Stay Safe from the Omicron Variant of COVID-19

Dr. SAHIL THAKAR

Dear Authors and Readers,

Greetings

At the time of writing this editorial, the new variant of the COVID-19 virus, named "Omicron" has emerged as a threat t the whole world.

Therefore, this editorial is written to all our authors and readers who visit our website and read the scientific articles published by the journal.

It was on 26th November 2021 that WHO designated the variant B.1.1.529, named Omicron, on the advice of WHO's Technical Advisory Group on Virus Evolution (TAG-VE).[1] This variation was first reported to WHO from South Africa on 24th November 2021. This puts Omicron into the most-troubling category of Covid-19 variants, along with the globally-dominant Delta, plus its weaker rivals Alpha, Beta and Gamma.

While publishing the manuscript, countries like Australia, Belgium, Botswana, Canada, Denmark, France, Germany, Hong Kong, Israel, Netherlands, Portugal, Scotland, South Africa, Switzerland (probable case), and the UK have all reported cases, while other countries have imposed travel restrictions to prevent the virus from reaching the country.[2]

While there is no clear understandings of the transmission and severity caused by this variant (at the moment), I, on behalf of the entire editorial board request you all to take proper precautions and no to be lax in any manner. Till now we have fought and won against this virus, we again need to show resilience and prevent the spread of this variant until research proves its severity and vaccine effectiveness against this variant.

This would also be the time to remind you all to maintain proper social distancing norms, to always wear a mask and wash/sanitize their hands frequently. You are also advised to try to stay indoors as much as possible and avoid unnecessary travel.

This pandemic has again put the age-old saying of *"Its better to be safe than sorry"* as a saying of wisdom in a COVID-19 affected world as the cost of laxicity can ultimately result in death, which would not only be a great loss to any family as well as a country, but be a great loss to humanity.

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REVIEW

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Role of Bone Grafts in Implant Surgery: A Review

CHANDNI[1], VINIT KUMAR*[2]

ABSTRACT

Introduction of dental implants and more concern in patients about esthetics after loss of natural teeth increases the demand of bone grafts. Various types of bone grafts as allografts, xenografts and autografts are used all with their own pros and cons. Bone grafts are more likely to succeed when the conditions at the recipient site are favourable and certain requirements are fulfilled. This review explores the use of various bone grafts in implant dentistry.

KEYWORDS: Bone Grafts, Augmentation, Bone defects, Implants

INTRODUCTION

The replacement of missing teeth by osseointegrated dental implants is a commonly utilized treatment option in dentistry. But results are dependent upon the type of bone at the recipient site, the site depends upon the bone generation process. As a result, the bone grafts are applied which changes the biological response into a regenerative rather than a predominant reparative pattern of healing. Use of guided tissue regeneration membranes increases the clinical success by providing better protection and containment of bone substitute in the defect.

BONE AUGMENTATION PROCEDURES:

Bone graft materials are defined as any synthetic materials that are available as bone grafts. These are safe materials. New bone is formed through osteogenic, osteoinductive or osteoconductive processes. However, these three processes have a difference in their mechanism of new bone formation.

Various types of augmentation procedures are available as:

1. AUTOGRAFTS
2. ALLOGRAFTS
3. XENOGRAFTS

These grafts act as scaffold which promotes new bone formation by osteogenesis, osteoconduction and osteoinduction, which are described as follows:

Osteogenesis: This process allows new bone formation by the action of osteoprogenitor cells that are present in the bone grafts.

Osteoconduction: Here, the graft itself functions as a scaffold upon which osteogenic cells move from the adjacent bone margins, to proliferate and allow new bone formation with replacement of the graft material with new bone.[1]

Osteoinduction: It leads to bone fill by the mechanism of transformation of undifferentiated mesenchymal stem cells from the tissue surrounding the graft to differentiate into osteogenic cells till new bone formation occurs.[2]

As a result, the treatment results are dependant upon the type of bone and sufficient bone quantity at the site of surgery for future implant treatment.[3]

When planning augmentation procedures of bone defects i.e. cases of bone deficient sites where Implant placement is difficult, particularly of the maxillary sinus or guided bone regeneration procedures of alveolar ridge, different types of bone graft materials play their role. In these situations it is impossible to place implants with bone grafts only.[4]

BONE GRAFT MATERIALS

Ideal graft material should have a resorption rate similar to the rate of new bone formation, resulting in an augmented site that consists of host bone alone.

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The ideal bone graft material should be:

1. Biocompatible: Ideally a bone Graft should be atleast identical to the bone in its physical and chemical structure leading to angiogenesis and fibrovascular tissue ingrowth at the desired site/surgical site.

2. Osteogenic or osteoinductive: It should be osteoconductive and leads to new bone formation and growth along the graft material.

3. Remodeling: The speed of remodelling of a graft material should be such that the rate of resorption is equal to the rate of formation of new bone.

BONE GRAFTS FOR IMPLANT DENTISTRY

In the present scenario, an Implant procedure is a treatment that replaces missing teeth, improves function, and enhances esthetics. However, cases of bone deficient sites where Implant placement is difficult, bone grafts play their role. In these situations, it is possible to place Implants with bone grafts only.

THE RATIONALE FOR BONE GRAFTS

Implant placement requires sufficient volume of bone and bone quality in a biological way. This is achieved by the particular implant design, which requires certain dimensional properties that is long lasting success.

Indications for Bone Grafts in Implant treatment are:

- In alveolar sockets after extraction
- Refilling a local bony defect due to trauma or infection
- Refilling a peri-implant defect due to peri-implantitis
- Vertical augmentation procedures of the mandible and maxilla
- Horizontal augmentation in the mandible and maxilla

RIDGE PRESERVATION TECHNIQUE

The techniques are beneficial as they decrease horizontal and vertical bone loss after extraction versus healing by blood clot alone. After extraction of natural teeth, in the first 2 years 40-50% of height and width of bone are lost, which hampers the alignment of Implant and their function as well as their esthetics. To avoid these side effects various techniques of ridge preservation are used to decrease horizontal and vertical bone loss after extraction.

The aims of ridge preservation techniques are:

- To avoid horizontal and vertical loss of bone
- Prevent soft tissue loss
- Avoid Alveolar ridge volume loss
- To avoid augmentation procedures or costly grafts.

BONE GRAFT CLASSIFICATION BY MATERIAL SOURCE

Many techniques are available to horizontally augment the alveolar ridge effectively and with good prediction.

Vertical augmentation techniques: These are not as effective and are not used for augmentation as compared to horizontal augmentation and lead to more complications.[5] Bone grafts lead to success when there are favourable conditions at the recipient site and there are certain requirements.

Four different types of bone graft materials have been commonly used and are classified as: Autografts, allografts, xenografts and alloplasts.

1. Allografts: Allografts are type of grafts that are prepared from bone matrix granules that are demineralized and these have different shapes.The granules are placed and bone is formed in the areas where planning of Implants have been done in the near future. These are indicated and are an effective alternative to autografts.

When large areas are indicated for grafting, an autogenous bone in the form of shell is used often as a biologic container. Then these grafts act as a scaffold on which new bone is formed as cells of graft die after few days and the remaining graft acts as a resorbable membrane.

In autogenous bone the cells present as bone cells die after a few days and then the bone plate functions as a stable, avital, a slowly resorbable membrane. Autogenous bone has both advantages and disadvantages which can be summarized as follows:

Autogenous bone must be harvested from certain intraoral or extraoral sites, with a comparitively higher morbidity as compared to nonautogenous materials (ie, risk of neural disturbances in case of intraoral grafts due to possible lesions of the inferior alveolar nerve branches, and gait disturbances in case

of harvesting from the iliac crest).

When a delayed implant treatment is planned, maxillary sinuses grafted with autogenous bone may receive implants in an earlier way as compared to non-autogenous bone substitutes.[2]

When sinus grafting procedures are planned, Autogenous bone is the material of choice and an associated onlay grafting of the maxilla is planned in the case of severe atrophy. In converse, there is a lack of information regarding such reconstructions with non-autogenous materials.

2. Allogenic bone blocks: The allogenic bone blocks in the form of blocks can also be used for a shell technique which acts as a substitute for an autogenous bone.[6]

Different bone grafting materials like autogenous, allogenic, xenogenic or alloplastic materials are used to fill the space between the local bone and surrounding shell.

3. Xenograft: It is derived from bone of another species (bovine or cow). It is processed at a very high temperature to avoid immune rejection and contamination.[5] It also acts as a scaffold on which new bone is formed from surrounding bone. This graft is osteoconductive and availability is present in various shapes and sizes. The greatest advantage of this graft is that there is no requirement of any second surgery to harvest graft from own body. Bovine collagen can also be used. It is produced by mixing untreated collagen and heat denatured collagen which is then freeze dried and then cross linked. Then sponge blocks are formed to place into the socket. Studies show increased healing with this xenograft in the extraction socket.[5]

4. Alloplast: These synthetic materials are available that act as bone grafts. These are safe materials. The most commonly used alloplastic materials are calcium phosphate based ceramics such as hydroxyapatite and tricalcium phosphate.

Tricalcium phosphates: The bio-active and materials that resorb are calcium phosphates. Bone cells proliferate and attach to the host cells. The graft is then removed from the implant site as bone grows into the formed scaffold. Initially there is an attachment of the graft into the matrix of bone and then degradation process occurs in a gradual way.

Hydroxyapatite: Hydroxyapatite ceramics when used as bone grafts are almost identical to natural bone in composition. Natural bone is made up of 2/3rd hydroxyapatite which is the inorganic part of the bone. It remains at the recipient site for a longer period due to its low solubility. It is an excellent biodelivery vehicle for growth factors and osteogenic cell population.[5] Grafts made up of Tricalcium phosphate alone are completely resorbed and they are replaced with bone within 5-15 months. As time passes full absorption of graft occurs and then replacement with bone occurs.

The basic principle of using HA and TCP in combination is a balance between the stable HA which can be found years after implantation, and the fast resorbing Tricalcium phosphate. The ratio between the two affects the resorptive properties of the graft material. A ratio between 65:35 and 55:45 of HA to TCP has been proven particularly suitable in many studies.[7] The HA remains at the recipient site for a longer period due to its low solubility. It is an excellent biodelivery vehicle for growth factors and osteogenic cell population. Products with TCP alone are completely resorbed and replaced by bone within five to 15 months.[2]

Bioactive glass: It is a synthetic graft material. There is an extensive use of this graft. It is a reactive graft when compared to inert materials like HA or TCP. It allows new bone formation by the release of mineral ions, that contributes to good properties of the graft.

After mixing with blood, the graft binds with bone and there is release of silica ions. These ions allow differentiation and proliferation of osteoblasts. With time, there is complete absorption of the graft and replacement with bone occurs.

Consensus on Surgical Techniques and Materials

• The survival of implants placed into grafted areas when compared with survival rates of implants placed into natural bone.[3]

The quality of the bone allows placement of graft material at the recipient site of the graft. The cancellous bone is preferred over cortical bone at the recipient site of the grafts.

The cells within the cancellous bone contribute to 60 percent of the healing capacity of the bone. In a young, healthy patient the periosteum contributes to 30 percent of the total healing capacity.

Cells in the cortical bone allows only 10 percent of bone healing. After extraction, when bone resorbs, cancellous bone shrinks more in comparison to cortical bone. As the cancellous compartment of the bone decreases, the provision for osteoblasts also decreases. Computerized tomography can reveal the ratio of cancellous bone to cortical at the recipient site prior to surgery.

This ratio between cancellous: cortical bone helps in the selection of the graft material as follows:
1. Only cortical bone–autograft is used.
2. Cortico-cancellous–depends on predominant type
3. Mostly cancellous–everything is possible.[8]
Ridge preservation techniques are beneficial as these decreases horizontal and vertical bone loss after extraction versus healing by blood clot alone.

The ridge preservation techniques help in maintaining ridge width and height. Most of the graft materials are used in these techniques and these are effective with only slight differences between them.

'External' augmentation procedures, both horizontal and vertical, on the alveolar ridge are more difficult than 'internal' augmentation procedures in sites like the maxillary sinus.[3]

In comparison, augmentation of vertical alveolar ridge defects have higher complications than those for horizontal defects.[5] And lastly, the prognosis gets worsened by blood supply, trauma or extensive surgery in the area, in smokers.[5]

Uncontrolled diabetes, radiation to head and neck, bisphosphonate therapy are at least relative contraindications for bone augmentation.[6]

Choice of grafting material: Grafting materials other than autogenous grafts are preferable for sinus floor elevation, with similar results in clinical outcomes and implant survival.[9]

CONCLUSION

Current literature shows that different bone graft as well as non-grafting treatment options are available for implant procedure each with their own advantages and disadvantages. Till today, we can restore a fraction of the bone volume in extent due to structural and interactive complexity of periodontium. Future research and new techniques, materials and advances in genetics, molecular biology, cell biology and biomaterials, have opened the door for new regenerative techniques based upon the recent development approach. Preference is given to less invasive procedures that carry lower risk of complications.

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REVIEW

QR CODE

COVID-19 Pandemic and the Debatable Use of Hydroxychloroquine

YASHIKA KAUSHAL*[1], RATIBHA KAUSHAL[2]

ABSTRACT

Healthcare professionals and scientists were not able to provide a good answer to the COVID-19 pandemic that shook the whole world. Hydroxychloroquine is an antimalarial drug with a good safety profile. It can be used in pediatric subjects as well as pregnant and breastfeeding women. Hydroxychloroquine is a widely used, essential drug in dermatology. It has got anti-inflammatory, antibacterial, antiviral and immunomodulatory properties. It was globally prescribed to prevent and treat COVID-19 caused by SARS-CoV-2 virus. The use of this drug in treating COVID-19 is debatable and for sure is not indicated in the labelling documents provided by the companies that manufacture this drug. The unnecessary use of this drug also led to short supply. We hereby review its properties, mechanism, safety profile and the issue COVID pandemic has caused to the supply of this drug.

KEYWORDS: COVID-19, Coronavirus, Hydroxychloroquine

INTRODUCTION

Hydroxychloroquine is a low-cost antimalarial derived from chloroquine with a good safety profile. It has an immunomodulatory, anti-inflammatory and photoprotective action, although it can act as a photosensitizer. In dermatology, it is indicated as first-line treatment in lupus erythematosus and is widely used off-label in multiple autoimmune/inflammatory skin diseases.[1-3] It possesses antibacterial, antifungal and antiviral properties, which is why it was prescribed off-label for prophylaxis and treatment of the infection caused by the coronavirus SARS-CoV-2 (COVID-19).[4,5] The increased use of hydroxychloroquine in this setting resulted in difficulties obtaining the drug and even a temporary shortage. Below, we review its mechanism of action and toxicities, and the threat that COVID-19 has posed to the supply of the drug.

Hydroxychloroquine has a high oral bioavailability; 45% is eliminated via the kidneys and it is metabolized by cytochrome P450, although its plasma levels are not affected by inducers or inhibitors of these enzymes. Its mechanism of action is complex. Its immunomodulatory action results from inhibition of antigen presentation through the major histocompatibility complex, stabilization of lysosomal membranes, a decrease in cell-mediated cytotoxicity and inhibition of multiple intracellular Toll-like receptors.[3] Its anti-inflammatory effect is secondary to the inhibition of phospholipase A2 and C and various cytokines and its photoprotective effect is secondary to its antioxidant and DNA-stabilizing properties, and to the reduction of interleukin levels after ultraviolet irradiation. It also decreases viral, bacterial and fungal survival in lysosomes and endosomes.[3]

This drug has immunomodulatory action. It inhibits antigen presentation through major histocompatibility complex, leads to stabilization of lysosomal membranes, decreases cell-mediated cytotoxicity and inhibits multiple intracellular Toll-like receptors. It has antioxidant properties and protects against UV induced free radical damage, it absorbs UV radiation, binds to DNA, regulates RNA transcription, reduces interleukin levels after UV irradiation and reduces antigenic presentation in irradiated skin. It exhibits antibacterial and antiviral action by alkalinizing intracellular phagosomes and organelles, reducing the growth and survival of intracellular bacteria and viruses and enhancing the intracellular action of antibiotics. It also inhibits post-translational viral protein modification and also inhibits sialic acid production. It is also known to have antithrombotic property wherein it inhibits platelet adhesion and aggregation, increases endothelium-mediated vasodilation, and inhibits the formation of antiphospholipid antibodies.

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Hydroxychloroquine also has lipid-lowering ability. It increases the number of LDL receptors and increases lipid excretion. This drug increases insulin secretion and insulin sensitivity.

Hydroxychloroquine has a good safety profile. Its discontinuation due to adverse effects is uncommon. One of the most feared toxicities is retinal, seen in 7.5% of patients, although it is extremely rare during the first 5 years of treatment. Doses greater than 5 mg/kg actual weight/day and duration longer than 10 years of treatment are associated with an increased rate of retinopathy.[6] Gastrointestinal adverse effects are relatively common and include anorexia, pyrosis, diarrhoea and abdominal distention. The most common cutaneous adverse effects are rash, hyperpigmentation and pruritus, and it may cause photosensitivity. Other rare toxicities include cardiac, muscle, and hematologic toxicities.[7] Hydroxychloroquine has powerful antimicrobial activity. An antiviral effect against influenza A and B, hepatitis B and C, herpes simplex, Chikungunya, Dengue, Zika and Ebola, among others, has been described. Hydroxychloroquine was considered one of the most promising drugs for the treatment of COVID-19. Its antiviral role is based on its potential ability to inhibit virus fusion with the host cell, block viral transport from endosomes to endolysosomes and reduce the cytokine storm in severe patients.[3] Antimalarials interfere with glycosylation of the angiotensin-converting enzyme receptor, a receptor used by SARS-CoV-2 to enter cells, decreasing viral penetration. They also alkalinize endosomes and endocytic vesicles, altering virus endocytosis. They also reduce the release of proinflammatory cytokines by decreasing antigenic presentation and CD4+ T-cell activation, and reducing intracellular signaling of Toll-like receptors.[8,9]

Despite the lack of consistent evidence that hydroxychloroquine was effective in the treatment or prevention of COVID-19 and although it was only recommended by the Infectious Disease Society of America within RCTs, the antimalarial was used in various hospital treatment protocols and even recommended to the general population.[4] The FDA warned of the potential cardiovascular effects of the drug, then authorized its use in patients hospitalized due to COVID-19, and subsequently withdrew this authorization.[10]

The high demand for the drug caused difficulties in administration and shortage.[4,5] Furthermore, India, one of the largest producers of generic hydroxychloroquine, temporarily prohibited the export of this drug, which affected the global supply chain.[4] In an international survey of members of the Systemic Lupus International Collaborating Clinics, 55% described a shortage of hydroxychloroquine during the pandemic among patients with SLE.[11] Other authors reported that there was anxiety and uncertainty among individuals with SLE because they could not access the medication.[12,13] Regarding the effectiveness of hydroxychloroquine in COVID-19, a recent meta-analysis that included 14 studies found no significant differences in survival, reduction in symptoms at 10 days or seroconversion rate, and described a higher rate of cardiovascular and gastrointestinal adverse effects than in the control groups.[10] A recent review of the Cochrane database found no significant differences in the risk of death from COVID-19 when using hydroxychloroquine, and the authors recommend that no further RCTs should be conducted with this drug in this disease.[14] A recently published RCT did not find any positive effect of hydroxychloroquine as COVID-19 prophylaxis either.[15] Hydroxychloroquine is an essential drug for the management of malaria and for the treatment of patients with certain rheumatological and/or dermatological diseases, and we believe it is important to be cautious in recommending this drug off-label for other diseases (including COVID-19), in order to ensure its supply to patients who require it.

CONCLUSION

Hydroxychloroquine is indispensable in the dermatological treatment arsenal. It is indicated in first or second line in multiple inflammatory, granulomatous, photoinduced or photoaggravated skin diseases. The treatment and prevention of COVID-19 with hydroxychloroquine has yielded unsatisfactory results and has caused difficulties in the supply of the drug. Greater caution is required when recommending large-scale use in off-label diseases, thereby ensuring access to the drug for patients who require it.

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REVIEW

QR CODE

Preterm Labor and Treatment Efficacy-Safety

PREETI GURUNG*[1], SHIKHA THAKUR[2], DAVID PRADHAN[3]

ABSTRACT

With medical sciences on the verge of advancement, preterm labor still remains a bothersome issue in modern obstetrics. A few therapeutic agents that suppress uterine contractile activity have gained success up to some extent. Tocolytics are medications used to suppress premature labor. These drugs can decrease the strength and frequency of uterine contractions and help in delay the onset of labor but are not able to prolong pregnancy to full-term. Presently, the choice of a best tocolytic drug remains debatable. This review discusses efficacy and safety of various useful agents which have been used so far. Further clinical trials are required to select an effective, and most importantly, safe therapy for the threatened preterm labor.

KEYWORDS: Tocolytics, Calcium Channel Blockers, Preterm Labor

INTRODUCTION

Preterm labor is defined as delivery occurring between 22 and 36+6 weeks of gestation, with gestational age determined based on the 1st day of the last menstrual period and fetal scanning performed in the 1st trimester.[1] About 15 million babies are born prematurely each year, and this number steadily increases. Complications of preterm labor are the leading cause of death in infants under 5 years of age. According to the WHO, the rates of preterm labor range from 5 to 18% of the number of the newborns in 184 countries.[2] Clinical symptoms that determine the true onset of labor are the same regardless of gestational age and are manifested as structural changes in the cervix and the onset of regular labor activity. Cervical changes include dilatation of internal orifice, shortening, softening, and centralization of the cervix. Cervical changes in the started PL occur within several hours, which distinguishes them from the cervical ripening process, which occurs over days or even weeks.[1]

The criteria for diagnosing the threatened preterm labor are manifested as irregular pain in the lower abdomen and lumbar region. Uterine hypertonus, shortening of the cervix, and opening of the external orifice are objectively detected. The started preterm labor is accompanied by lower abdominal pain, recorded regular uterine activity, central position of the shortened, softened, and often dilated cervix, mucosal or mucosal-serous secretions from the genital tracts suggestive of cervical ripening. Amniotic fluid may discharge prematurely. In a few countries, nifedipine and atosiban are recommended as first-line tocolytic therapy.[1] Nifedipine and atosiban have comparable efficacy in prolonging pregnancy for up to 7 days. Compared with β-agonists, nifedipine is associated with improved neonatal outcome, but long-term data are not available to date. A meta-analysis showed no significant differences between atosiban and nifedipine in prolonging pregnancy. However, atosiban was associated with fewer maternal side effects than nifedipine.[3] The use of nifedipine and atosiban within 48 hours in pregnant women at risk of preterm labor is associated with similar perinatal outcomes.[4] A study showed showed that infants born before 32 weeks of gestation after tocolytics use had a high incidence of craniocerebral injury. No significant differences were found in the organic brain lesion between neonates whose mothers received nifedipine and neonates who received atosiban.[5] Compared with β-adrenergic agonists the use of atosiban was associated with a significantly lower incidence of adverse events such as tachycardia, palpitations, vomiting, headache, hyperglycemia, tremor, dyspnea, chest pain,

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hypokalemia, and fetal tachycardia.[6] In another study, atosiban was found to be a more effective tocolytic than hexoprenaline in the treatment of threatened preterm labor. A study showed that atosiban prolonged pregnancy by 48 hours or more in 71.9% of pregnant women.[7] In another study, the comparison of nifedipine and fenoterol showed the same latent period in both groups. More side effects were reported in the fenoterol group. The economic evaluation did not reveal a significant difference in cost savings between the groups receiving either drug. Neither clinical nor economic superiority of either of the two drugs was demonstrated in the study.[8] A randomized study showed a difference between oral and sublingual use of nifedipine. The time required for tocolysis was significantly shorter with sublingual nifedipine. Sublingual nifedipine was also more effective than oral nifedipine in stopping preterm labor within 90 minutes.[9] Other randomized study demonstrated the efficacy of nifedipine in combination with sildenafil citrate with fewer deliveries within 7 days of hospitalization and fewer admissions in neonatal intensive care units, fewer early preterm deliveries, and increased birth weights.[10] Comparison of nifedipine with terbutaline in other study showed a similar tocolytic effect of the drugs. However, nifedipine was associated with fewer side effects.[11]

Atosiban is also preferred over β-adrenergic agonists and drugs with similar effects. The prolongation of pregnancy by 48 hours was significantly higher in the atosiban group than in the ritodrine group, while the prolongation of pregnancy by 7 days was similar in both groups. The incidence of side effects in pregnant women was higher in the ritodrine group than in the atosiban group, but the prevalence of abnormal fetal heart rhythm was not statistically significantly different. Both perinatal mortality and prevalence of neonatal asphyxia were significantly lower in the atosiban group. Perinatal mortality and prevalence of neonatal pneumonia were also lower in the atosiban group when using the drug at gestational age less than 28 weeks. Regardless of the drug initiation time, there were no significant differences between the atosiban and ritodrine groups in the cases of neonatal asphyxia, acute respiratory distress syndrome, neonatal craniocerebral injury, or neonatal sepsis.[12] A randomized, controlled study compared the efficacy of the nicorandil, a potassium channel blocker, and nifedipine, a calcium channel blocker, for tocolysis in preterm labor. Nicorandil was comparable to nifedipine in terms of pregnancy prolongation by 48 hours, 7 days and up to 37 weeks of gestation. Nausea and vomiting, maternal tachycardia, and fetal tachycardia were significantly more common in women treated with nicorandil. Headaches were significantly more common in women treated with nifedipine. There was no difference in neonatal outcome between the two groups.[13] To date, indomethacin remains a second line tocolytic, but studies have shown a low safety profile. A meta-analysis showed the probability of pregnancy prolongation by 48 hours was highest in prostaglandin inhibitors versus placebo, followed by magnesium sulfate, calcium channel blockers, β-adrenergic agonists, and atosiban. Compared to placebo, the side effects requiring drug switching were significantly higher for β-adrenergic agonists, magnesium sulfate, and calcium channel.[14] Studies of progesterone use in successful tocolysis are controversial and require further investigation. Maintenance vaginal progesterone tocolysis is associated with significant prolongation of pregnancy and lower neonatal sepsis.[15] Another study also showed benefits of vaginal progesterone in pregnancy prolongation after successful tocolysis with atosiban.[16] A systematic review by showed that women treated with 17-alpha hydroxyprogesterone caproate had significantly later gestational age at delivery and higher neonatal weights compared to controls. Other secondary outcomes, including neonatal mortality, neonatal intensive care unit admission rate, neonatal respiratory distress syndrome, bronchopulmonary dysplasia, intraventricular hemorrhage, necrotizing enterocolitis, and neonatal sepsis, were similar in both groups.[17] In contrast, other study showed that injections of 17-alpha-hydroxyprogesterone caproate did not significantly prolong pregnancy in women with preterm labor after tocolysis.[18] Two studies demonstrated the efficacy of prolonged progesterone tocolysis compared to nifedipine with better neonatal outcomes and fewer side effects.[19,20] A study conducted in India showed that oral micronized progesterone significantly prolonged pregnancy.[21] A systematic review including 16 randomized controlled trials showed that the preterm labor rate at less than 37 weeks of gestation decreased and gestational age increased when women received progestogens compared to placebo or no treatment.[22] Another study showed that progesterone was ineffective in the prevention of PL after successful tocolysis.[23] Both the development of new drugs for tocolysis and the study of

combinations of the available tocolytics are promising. It is not clear whether a combination of tocolytic drugs in preterm labor is more effective in women and/or neonates because of the lack of large studies of combination tocolytic regimens. Further trials are needed before specific conclusions can be drawn about the use of combination tocolytic therapy in preterm labor.

CONCLUSION

The analysis of available literature showed that preterm labor is the leading cause of neonatal morbidity, mortality, and long-term consequences. Prevention and treatment of preterm labor remain a challenge in modern obstetrics. The accumulated domestic and foreign experience suggests that despite the increasing range of tocolytic agents, there are currently no more effective agents to suppress the contractility of the uterus than oxytocin receptor agonists and calcium channel blockers. As for neonatal outcomes, it is difficult to select the preferred drug because all tocolytics have a similar spectrum of outcomes for the fetus and newborn. Many studies suggest that clinicians should use a tocolytic that has produced the best results with the least adverse effects for the mother/newborn. It is necessary to continue clinical trials in order to select an effective, and most importantly safe, therapy for threatened preterm labor.

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ORIGINAL RESEARCH

QR CODE

Knowledge, Attitude and Practice Regarding Tobacco Cessation Methods among the Dental Professionals of Bareilly International University: A Cross-sectional Study

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ABSTRACT

INTRODUCTION: In India, the percentage of deaths caused by tobacco smoking is anticipated to rise from 1.4 percent in 1990 to 13.3 percent by 2020.Health care experts have done their best to persuade and counsel users to quit the habit through their collaborative efforts.
AIM AND OBJECTIVES: Assessment of dentistry students' attitudes and practices concerning tobacco cessation strategies, as well as the role of information in their promotion.
MATERIALS AND METHODS: This cross-sectional survey was carried out at the Institute of Dental Sciences, Bareilly among the dental professionals, i.e. final year, interns, postgraduates students. The questionnaire was designed to test the knowledge, attitude, and practice of dental students regarding tobacco use. The self-administered survey included a set of questions. Descriptive statistics and Chi-square test had been used to test associations between their responses among age, qualification, and academic year using statistical package for social sciences (SPSS) version 22.
RESULTS: A total of 300 surveys were sent out, with a 96.39 percent response rate. There were 54 percent females and 46 percent males among the 250 participants. Approximately 68 percent of people were between the ages of 20 and 23. In the current study, 32.4 percent were seeking MDS and 67.6 percent were pursuing BDS. Nearly half of those prefer to prescribe nicotine replacement therapy (NRT) as a cigarette cessation recommendation to patients, followed by self-quitting at 48% and pharmaceutical approaches at 1.2 percent.
DISCUSSION: More than half of the respondents had an average level of awareness of smoking cessation therapies, and the majority of them had a favorable attitude toward their provision. As a result, it is important to persuade students to develop an interest in learning about tobacco quitting strategies.

KEYWORDS: Oral Cancer, Smoking, Tobacco

INTRODUCTION

Tobacco usage has risen to the top of the list of preventable illnesses, disabilities, and mortality around the world. Every year, it kills almost 6 million people around the world. Due to the extensive consumption of a range of smoking products and smokeless tobacco forms, India's tobacco concerns are extremely complicated. The majority of the items are made in cottage and small-scale businesses, with different mixes and mass differences in the manufacturing processes.[1]

Tobacco has historically played a crucial role in the attribute of a number of serious oral conditions; it is a risk factor for oral cancer, precancerous conditions, and periodontitis, in addition to being related with a number of cancer and cardiovascular conditions.[2] Health-care providers are always important in motivating and encouraging their patients to try and quit smoking.

The 2000 Public Health Service clinical guideline presents that "brief physician advice significantly increases long-term smoking abstinence rates." However, according to the above guideline, vigorous interventions are always more effective than less intensive interventions and should be priorly used whenever possible.[3]

The Journal of the Canadian Dental Association has made it a priority to disseminate information about the link between tobacco use and oral illnesses among health institutions and to highlight the responsibility of dental health care practitioners to encourage smoking cessation.

Many western countries, such as the United States, are being held responsible for the quality, safety, and cost-effectiveness of their health-care programs and services.[6] In India, the percentage of tobacco-related deaths is anticipated to increase from 1.4 percent in 1990 to 13.3 percent in 2020.9 Physicians advise is well-received and would be followed seriously in practice, according to users.

As a result, doctors should take advantage of the chance to offer smoke cessation therapies during normal clinical visits with patients.[10] Patients who use tobacco consult dental surgeons the most, thus their

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role in informing patients about the risks and side effects is even more important.[11] Being a motivating counsellor demands a good attitude.

Nicotine replacement therapy has resulted in a significant increase in the rate of cessation with year-long therapy. In light of the present worldwide tobacco consumption situation, dentists must be informed of tobacco cessation measures such as nicotine replacement therapy (NRT) and counselling schedules. Time and reimbursement concerns, poor education, a lack of further postgraduate training, and a lack of coordination of dental and smoking cessation programs are all reasons for not giving instruction to patients.

The aim of the present study is to assess the dental student's attitude towards tobacco cessation measures in the dental setting and to radiate the influence of knowledge, its effectiveness, gender and curriculum of cessation programmes.

This study provides evidence that dental undergraduates are willing to give smoking cessation counselling to their patients but perceive barriers of knowledge. We, therefore, have attempted to carry out a survey on the knowledge, attitude, and practices of dental health professionals regarding tobacco use.

MATERIAL AND METHODS

This cross-sectional survey was carried out at institute of dental sciences Bareilly among the undergraduates, i.e., final year, interns and postgraduate students.

A questionnaire was constructed to test the knowledge, attitude, and practice of dental surgeons regarding tobacco use. 18 questions were included in a self-administered survey instrument: (1) personal information; knowledge of the dangers of smoking and tobacco control policies; (3) smoking cessation interventions delivered to patients; and (4) dental surgeons obtaining training in smoking cessation strategies.

Data were analyzed using SPSS version 22. All clinical and postgraduate students of Institute of Dental Sciences, Bareilly who were present on the day of distribution of the questionnaire, were included in the study.

A Cronbach's alpha value of 0.85 was found after the questionnaire was provided to a sample of 15 students attending a public health dentistry clinical posting who were interviewed to gain input on the questionnaire's overall acceptability, validity, and reliability.

Each person was instructed to complete the questionnaire in front of the investigator with sufficient time to avoid any mistakes. Throughout the procedure, confidentiality was maintained. Data collection and analysis were excluded from incomplete response sheets.

The answer keys for the main questions on nicotine replacement treatment knowledge were created using the tobacco cessation measures guidelines, which were written concurrently with the guidance on smoking cessation strategies produced by the University of York's Centre for Health Economics.

Data analysis: Data from 250 clinical dentistry students were entered into an Excel spreadsheet, and descriptive and inferential statistical analyses were performed. For the analysis, SPSS software version 22 was applied. The chi square test was used. . A critical p value of 0.05 was regarded as significant.

RESULTS

A total of 300 questionnaires were distributed, out of 260 were returned, out of the 250 participants,54% were females and 46% were males (Figure 1). Approximately 68 percent of participants were between the ages of 20 and 23 (Figure 2). According to academic levels, the sample consisted of three groups: fourth-year Bachelor of Dental Surgery (BDS; 28.4 percent), interns (39.2 percent), and postgraduates (32.4 percent). In the current study, 32.4 percent of the students were pursuing a Master of Dental Surgery (MDS) while the majority (67.6%) were studying a Bachelor of Dental Surgery (BDS).

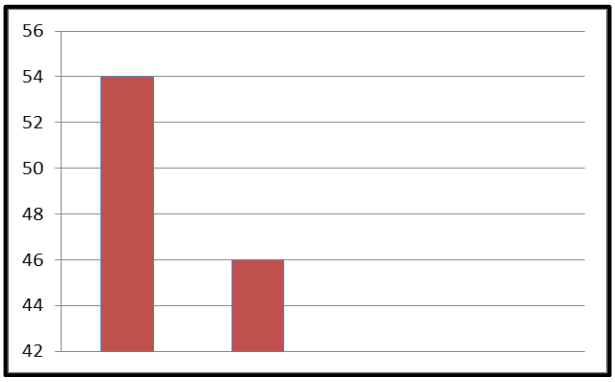

Figure 1. Gender Distribution of the Study Population

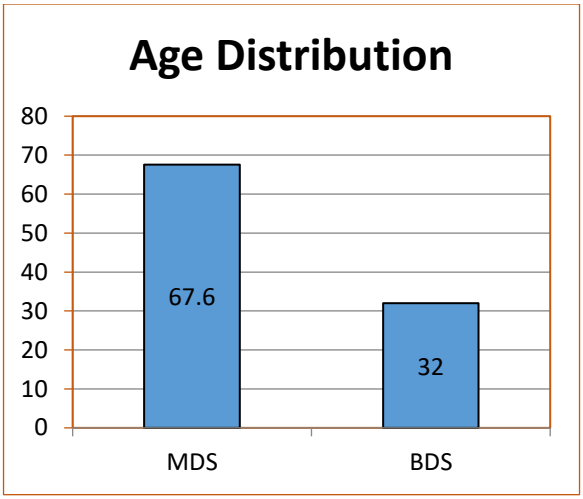

Figure 2. Age Distribution of the Study Population

Knowledge of Treatment Modalities (Table 1)
Only 26% of students recognized that nicotine nasal spray is absorbed faster, despite the fact that 11.2 percent of respondents were aware of the use of NRTs. Nicotine patches were unknown to 49.6% of people, while nicotine gums were unknown to 49.2%. Only 42% were aware that nicotine has an immediate fatal dosage. Only 94 percent of the students were aware of tobacco cessation education programs, but the majority were uninformed of the available pharmacological techniques (nicotex, nasal sprays, nicotine patch, and so on) and their dosage.

Attitudes of Dental Professionals Regarding Tobacco Cessation (Table 1)
Nearly 53.2 percent of doctors keep track of patients with bad habits, and 79.2 percent feel that nicotine replacement therapy can quadruple the chances of stopping smoking. However, there is reluctance to suggest NRTs for smoking cessation to patients due to a lack of understanding of its applications and negative effects. Almost all (88%) agreed that stringent legislation should be enacted to prohibit public use of cigarettes, that the media had a significant influence in tobacco promotion, and that the size of warning labels on tobacco products should be increased. A majority of 41.2 percent agreed that prohibiting cigarette use in public places is an effective way of tobacco control. Because physicians are ignorant of these smoking cessation approaches, nearly 97.6% feel that smoking cessation education should be included in the core curriculum of all health professionals' basic training.

Practice of Dental Surgeons Regarding Tobacco Users Among their Patients (Table 1)
About 97.2 percent of those polled had encountered patients who used cigarettes, and 94.8 percent actively campaigned for tobacco cessation. 46.8% did not follow-up on their tobacco-using patients or keep a record, and 50 percent preferred to propose NRT as a tobacco-cessation recommendation to their patients, with 48 percent advising self-quitting and 1.2 percent recommending pharmaceutical approaches. As a result, there is a perceived need to be informed of all the ways available to support better treatment for persons contemplating quitting their habit.

DISCUSSION

For willing patients, dental offices and institutes are regarded a broad setting for advising tobacco cessation intervention services. Dental patients are highly receptive to health messaging, which gives significant encouragement to quit smoking. In the primary care context, there are five major phases to intervention (the "5 As"). Previously, the dentist would "Ask" the patient if he or she uses tobacco, then "Advice" him or her to quit, then "assess" willingness to try to quit, "Assist" the patient, and "arrange" for follow-up contacts to prevent relapse.[14]

According to a study of dental professionals, it is the dentist's obligation to provide tobacco cessation information in order to persuade patients to quit smoking, and the majority were also persuaded to undergo formal training in tobacco cessation methods. In our study it was found that that only half of them question about their clients' tobacco use. According to data obtained globally, up to half of all dental surgeons counsel and offer techniques to quit smoking to their patients.[15]

Similar to Severson et al., only 53.2 percent of respondents in our study kept records or campaigned for smoke cessation strategies among clients, which is consistent with other studies.[16]

Only around 35.6 percent of dental professionals in this research knew about behavioral tobacco cessation approaches, and only about 35.6 percent knew about different types of nicotine replacement treatment. Only 1.2 percent of health professionals were aware of pharmacotherapy, indicating the urgent need to educate health professionals about additional cigarette

QUESTIONS	RESPONSE	N	%	p VALUE
1. Do you come across patients with tobacco habits?	(A) Yes (B) No	243 7	97.2 2.8	0.25
2. Are you aware of tobacco cessation education programme?	(A) Yes (B) No	235 15	94.0 0.6	0.589
3. Do you provide patient with tobacco cessation advise?	(A) Yes (B) No	237 13	94.8 5.2	0.553
4. Which tobacco cessation method do you prefer to recommend?	A)Nicotine replacement therapies (B) Self quitting method (C)Pharmacological methods	125 122 3	50 48 1.2	0.225
5. Do you follow up or keep a record of these patients?	(A) Yes (B) No	133 117	53.2 46.8	0.963
6. Can nicotine replacement therapies (NRTs) double the chance of success in quitting the habit of smoking?	(A) Yes (B) No	198 52	79.2 20.8	0.482
7. Do you have adequate knowledge about NRTs?	(A) Yes (B) No	89 161	35.6 67.4	0.318
8. Nicotine replacement therapy (NRT) is designed to use for?	(A)12 weeks (B) 4 weeks (C) Do not know (D) 16 weeks	46 28 135 41	18.4 11.2 54.0 16.4	0.001
9. Which product is absorbed faster?	(A) Nicotine skin patch (B) Nicotine gum (C) Nicotine nasal spray (D) Do not know	60 41 66 83	24.0 16.0 26.0 33.0	0.229
10. How much dose of nicotine gum should be advised to a heavy smoker?	(A) 4 mg (B) 6 mg (C) 8 mg (D) Do not know	28 58 49 123	8.0 23.2 19.6 49.2	0.006
11. Nicotine skin patch should be worn for?	(A) 24-48 Hours (B) 16- 24 Hours (C) 8-10 Hours (D) Do not know	19 62 45 124	7.6 24.8 8.0 49.6	0.000
12. Nicotine patch and inhaler are not recommended upto which age group?	(A) <18Years (B) <10 Years (C) <15 Years (D) Do not know	51 54 42 103	20.4 21.6 16.8 41.2	0.009
13. Acute Lethal dose of nicotine is?	(A) 20–30 mg (B) 40–60 mg (C) 80–100 mg (D) 30-50 mg	27 105 65 53	10.8 42.0 26.0 21.2	0.093
14. NRTs have the potential to increase the blood pressure by?	(A) 0–5 mm hg (B) 5–10 mm hg (C) 10–15 mm hg (D) Do not know	28 60 52 110	11.2 24 20.8 44.0	0.000
15. Hesitation towards recommending NRTs for smoking cessation to patients is due to	(A)Lack of knowledge about NRTs (B) NRTs are not helpful to quit smoking (C) NRTs have hazardous side effects (D) All of the above	193 20 21 16	77.2 8.0 8.4 6.4	0.211

16. Would you recommend a strict legislation on tobacco use in the public?	(A) Yes	220	88.0	
	(B) No	30	12.0	
	If Yes,			0.147
	(A) If no	28	11.2	0.043
	(B) Ban on public use of tobacco	103	41.2	
	(C) Increase price of tobacco products	4	1.6	
	(D) Increase the size of warning labels on the tobacco products	4	1.6	
	E) All of the above	111	44.4	
17. Should smoking cessation education be a part of the core curriculum of the basic training of all health professionals?	(A) Yes	244	97.6	
	(B) No	6	2.4	0.044

Table 1. Responses to the questionnaire by the respondents. (p ≤0.05 significant, p ≤0.01 highly significant)

quitting options, comparable to Murthy et al., 2010.[17]

In contrast to Omolara et al., over 16 percent of them believe that nicotine replacement therapy is ineffective in helping people stop smoking, and 6.40 percent believe that nicotine gums have negative side effects. Many students believe that cessation therapy sessions are ineffective in getting patients to quit smoking. Furthermore, more than 80% of respondents said their time could be better spent on other activities. Approximately 94.8 percent of responders encourage patients to engage in cigarette cessation measures comparable to those recommended by Omolara et al. According to the findings of this study, many of the dental students who took part in the survey had no prior experience in treatment techniques for nicotine replacement therapy. Furthermore, there is no demand for these services because of patient expectations. If smoking cessation behavior in dental practice is to be improved, training in the dental curriculum must be included, and over 250 (97.2 percent) respondents agreed that cessation training is an important aspect of the dental curriculum, comparable to the findings of the Karbhari et al. study. The insufficiency of training, according to Ehizele et al., is a barrier to promoting cessation services among dental students. The inclusion of smoking cessation in dental colleges' curricula, as well as the availability of continuing dental education in tobacco intervention, are critical for dental professionals to have up-to-date information and to equip them to play an effective role in overall smoking cessation and prevention. As a result, it is necessary to provide such training to health-care workers. The dentist's didactic and practical training takes place in the framework of the practice's day-to-day operations.

CONCLUSION

Our research recommended that a tobacco documentation centre be established within the institutes, with suitable training provisions for smoking cessation approaches. The requirement for introducing advice and training services for health care workers in tobacco-cessation counselling strategies has been recommended by researchers. It was also stated that experts' positive attitudes regarding smoking cessation do not always transform into good practice. This could be due to roadblocks encountered in putting available knowledge into practice and translating a positive attitude into clinical practice. Further research involving a variety of institutes will provide additional light on the organizational practice of smoke cessation treatments in India. To spread the vision of tobacco-free zones across the country, it is important that smoking cessation counselling is entrenched in the dental curriculum as future role models.

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ORIGINAL RESEARCH

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Morbidity, its Patterns and Associated Factors among School Children Residing in a North Indian City

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ABSTRACT

INTRODUCTION: Children are the pillars of the future of a country shall rest, are no less than a treasure and need to be as healthy as possible.
AIM: To assess the health status of school children in various areas of Una city, Himachal Pradesh, India.
MATERIALS AND METHOD: The present study was conducted among school children aged 7-18 present on the day of the study. Data collected was cross-sectionally using a pre-validated and pre-tested questionnaire duly standardized prior to commencement of the study. The first section of the questionnaire contained details about the demographic profile, and in the second, the examiners recorded the presence or absence of common childhood diseases, namely pallor, lymphadenopathy (L.N.), Bitot spots, Worm infections, Scabies, Ear discharge, Dental caries and Fluorosis. Statistical analysis included the Shapiro-wilk test to check for data normalcy, followed by descriptive statistics and Pearson's correlation. Significance value (p) was kept significant at ≤0.5.
RESULTS: Most children belonged to the age group of 12-15 years (42.8%), followed by 7-11 years(34.3%) and 16-18 years(22.9%). Majority of the students were girls (61.5%) and most them belonged to the age group of 12-15 years(41.0%). Disease in any from was observed in 813 (76.2%) of the children, with the most prevalent disease observed being dental caries (32.3%), followed by fluorosis (20.5%) and pallor (14.3%). Pearson's correlation revealed a strong, positive association between the disease status and age (0.7) and gender (0.8)
CONCLUSION: The results of the present study indicate the need to have various specific programmes to reduce the burden of various diseases, namely dental caries and pallor among school children through efforts of various programmes.

KEYWORDS: Morbidity, Children, Caries, Worm Infection

INTRODUCTION

Children, who are god's greatest gifts and are the foundation on which the pillars of the future of a country shall rest, are no less than a treasure and need to be as healthy as possible. However, in some places, communities still are deprived of essentials such as clean water and proper health-care facilities.[1] Even so, there are reports stating that the quality of life among school children, by most standards continues to be poor in certain parts of the globe, especially in rural areas and urban slums.[2]

The present position with regard to the health and nutritional status of the children in our country is very unsatisfactory, with mortality being low, but morbidity and physical defects constitute heavy burden, even when under the ICDS Scheme; freshly, cooked food supplements are provided to children aged 3-6 years while take-home-rations of food grains are provided to children aged 6 months until 3 years.[3] School health programs can help to ensure that children are healthy and able to take full advantage of what is often their first and only opportunity for formal education.[4]

Health surveys in Indian schools indicate that morbidity and mortality rates of children of primary school age are among the highest in the World.[5] Under nutrition continues to be a primary cause of ill-health and premature mortality among children in developing countries.[6] Under nutrition among children is prevalent in almost all the states in India.[7]

Surveys carried out indicate that the main emphasis will fall in malnutrition, infectious diseases, intestinal parasites, diseases of skin, eye and ear and dental caries.[8] These health problems can make learning difficult and may seriously hamper the educational process and the child's intellectual growth and may also handicap the child for life. Keeping all these facts in view, a need was felt to assess the health status of school children in various areas of Una city, Himachal Pradesh, India.

MATERIALS AND METHODS

The present study was conducted among school children aged 7-18 years after obtaining proper approvals from the concerned authorities. Students absent on the day of the examinations were excluded from the study.

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Data collected was cross-sectionally using a pre-validated and pre-tested questionnaire by examiners (including the dentist) duly standardized prior to commencement of the study. The first section contained details about the demographic profile, and in the second, the examiners recorded the presence or absence of common childhood diseases, namely pallor, lymphadenopathy (L.N.), bitot spots, worm infections, scabies, ear discharge, dental caries and fluorosis.

Statistical analysis included the Shapiro-wilk test to check for data normalcy, followed by descriptive statistics and Pearson's correlation. Significance value (p) was kept significant at ≤0.5.

RESULTS

Table 1 describes the gender-wise distribution of the children. It was observed that most children belonged to the age group of 12-15 years (42.8%), followed by 7-11 years(34.3%) and 16-18 years(22.9%). Majority of the students were girls (61.5%) and most them belonged to the age group of 12-15 years(41.0%).

AGE	BOYS (%)	GIRLS (%)	TOTAL (%)
7-11 years	166(40.4)	200(30.4)	366 (34.3)
12-15 years	188(45.7)	269(41.0)	748 (42.8)
16-18 years	57(13.9)	187(28.6)	185 (22.9)
Total	411 (38.5)	656 (61.5)	1067 (100)

Table 1. Age and Gender Wise Distribution of the Schoolchildren

Disease in any from was observed in 813 (76.2%) of the children. Upon further analysis, the most prevalent disease observed was dental caries (32.3%), followed by fluorosis (20.5%) and pallor (14.3%). The least percentage of disease observed was Worm infection(8.2%) followed by L.N.(3.6%) (table 2).

DISEASE	NUMBER	PERCENTAGE
Pallor	117	14.3
L.N	29	3.6
Bilot spot	61	7.5
Worm infection	67	8.2
Scabies	36	4.5
Ear discharge	74	9.1
Fluorosis	166	20.5
Dental Caries	263	32.3

Table 2. Prevalence of various diseases among the Schoolchildren (LN: lymphadenopathy)

Analysis of the data by the Pearson's correlation revealed a strong, positive association between the disease status and age (0.7) and gender (0.8) (table 3).

	AGE	GENDER
Disease Status	0.7	0.8

Table 3. Pearson's Correlation Relating the Disease Status of The Children with Age And Gender

DISCUSSION

The results of the present study documented disease in any from among 76.2% of the children, with the most prevalent disease observed was dental caries (32.3%), followed by fluorosis (20.5%) and pallor (14.3%).

The overall prevalence of 38.5% boys and 61.5% females observed in the present study is in contrast to the observed prevalence of Utkarsh S et al.[9] (59.5% males & 40.5% females) and Dambhare et al. (68.97% males and 31.03% girls).[2]

Children enrolled in the present study revealed an overall presence of 32.3% of dental caries, which was lower as compared to the findings of Syed S et al. (56.24%)[10], and higher as compared to Shakya SR et al. (19.8%)[11] and Phuljhele S et al. (10.91%).[12]

Worm infection among the children was observed as 8.2%,; and this percentage was higher as compared to Khanal LK et al. (17.6%)[13] and higher as per Singh JP et al. (2.50%).[14] These findings indicate that plans of the government as well as other not for profit organizations have helped reduced the burden of this worm infections.

The second most prevalent disease observed among children was fluorosis (20.5%) and this was low as per the findings of Shekar C et al. (71.5%)[15] and Sebastian ST et al. (41.73%).[16] Such variations can be attributed to the presence of fluoride belts, increased presence fluoride in of water as well and the intake of fluoridated water by the mother during pregnancy.

CONCLUSION

Based on the results of the present study, there is a need to have various specific programmes to reduce the burden of various diseases, namely dental caries and pallor among school children through efforts of various programmes of the government and assistance of various not-for profit organizations.

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