

## Book Review

# Dental Caries

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Nepal is currently facing an oral healthcare crisis with high prevalence of dental caries and periodontal diseases. Although International Federation of Dental Hygienists (IFDH) accepted the Dental Hygienists' Association Nepal (DHAN) in August 2013 as a non-financial member representing the professional interests of the more than 600 registered dental hygienists (RDHs) for the mutual co-operation and understandings. But, most of the adults in the country suffer from dental caries which leads to infections, gum disease and chronic pain as well as heart disease and diabetes.

It's very eye-catching to gaze the young author of Nepal from microbiology discipline for this book, as the title "Dental caries" advocates that the authorship should be from dentistry or its affiliates. Ms. Khushbu Yadav, Medical Microbiologist, after completion of her post graduate from Tribhuvan University, Nepal has been involved in teaching and learning activities for different health related programmes at Janakpurdham, Nepal. She has been actively involved in research activities and has several scientific national and international publications. She has also been devoting her time in microbiology laboratories for quality controlling at different local hospitals and enthusiastically

ambitious towards contribution and promoting microbiology in the country.



Photograph illustrating dental cavity

Despite great improvements in the oral health of population in several developing countries, World health organization pointed that the global problem of oral disease still persists. The book is divided into six chapters. The first chapter deals with general introduction and microbial community of dental caries while second chapter highlights the caries related factors, complications,, diagnosis, mechanism of antibiotic resistance and the commonly used antibiotics in resistance.

Dental Caries

Dental caries is unique chronic disease among human which is one of the most common important global oral health problems in the world today. It is the destruction of dental hard acellular tissue by acidic by-products from the bacterial fermentation of dietary carbohydrates especially sucrose. It progresses slowly in most of the people which results from an ecological imbalance in the equilibrium between tooth minerals and oral biofilms which is characterized by microbial activity, resulting in fluctuations in plaque pH due to bacterial acid production, buffering action from saliva and the surrounding tooth structure. The microbial community of caries is diverse and contains many facultatively and obligately-anaerobic bacteria. *S. mutans* is the most primary associated with it. Dental disease has been associated with low self-esteem, adverse pregnancy outcomes, and increased risk of myocardial infarction, cardiovascular, respiratory, erectile, diabetes complications, cavernous sinus thrombosis and Ludwig angina which can be life-threatening. Treatment, prevention, personal hygiene and dietary modification should be recommended for dental caries patients.



Khushbu Yadav

## Dental Caries

### Bacteriological Profile of Dental Caries



Ms. Khushbu Yadav has obtained her M.Sc in Medical Microbiology from National College, Tribhuvan University, Kathmandu, Nepal in 2015. She is working as a lecturer in Microbiology and Nutrition and Dietetics to Bachelor level Nursing students at Krishna Medical Technical Research Center (KMTRC), Janakpur, Dhanusha, Nepal.



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The third chapter deals with the monitoring and regular evaluation of laboratory equipment, reagents and different media and microbiological procedures in bacterial isolation while fourth chapter deals with the growth pattern of bacteriological profile, macroscopic examination and distribution of different bacterial isolates. The fifth chapter focuses the comparative studies on different antibiotic susceptibility pattern of bacterial isolates in dental caries and the sixth chapter provides overview information on *S. mutans* and *S. aureus* as the most causative agent of dental caries.

Nepal is one of the developing countries facing a high prevalence of dental caries. At the beginning of first chapter, author provides overview information on dental

caries highlighting the microbial diverse community of dental caries. The author represents very lucidly about the distribution and severity of dental caries varying in different parts of the world and within the same country or region which affects 60-90% of school children and the vast majority of adults. The prevalence pattern of dental caries varies with age, sex, socio economic status, race, geographical location, food habits and oral hygiene practices.

Moreover, the introductory part of the book symbolizes many facultatively and obligately-anaerobic bacteria belonging to the genera *Actinomyces*, *Bifidobacterium*, *Eubacterium*, *Lactobacillus*, *Parvimonas* and *Rothia* and members of the mitis, anginosus and salivarius groups of streptococci. These

species are prevalent on mucosal surfaces and reach very high concentrations in dental plaque, gingival crevices and tonsillar crypts has been emphasized in the book.

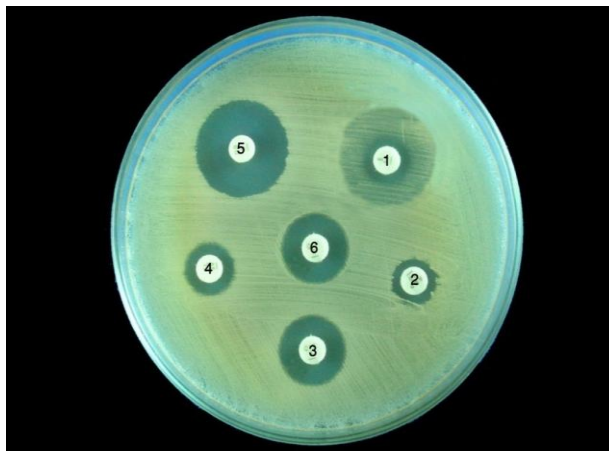
Caries are the most important global oral health problems, although conditions such as oral and pharyngeal cancers and oral tissue lesions are also significant health concerns. The author has nicely presented the prevalence and antibiotic resistance pattern of dental caries in different parts of the world. There are certain locations on the tooth that are prone to caries: the occlusal pit and fissure, the approximal surface cervical to the contact point, buccal or lingual surfaces along the gingival margin and tooth-restoration interfaces has been evidently discussed inside the book.

The mutans streptococci (MS) are the major pathogens of dental caries because they are highly acidogenic and aciduric. They are able to produce extracellular matrix of water-insoluble glucans which enhances bacterial adhesion to the tooth surface and to other bacteria has been nicely scripted in the book.

Of all  $\beta$ -lactams antibiotics, penicillins are the most widely used antimicrobial agents in dentistry. The author also discusses the narrow-spectrum penicillinase-sensitive agents, such as penicillin G and penicillin V, and the broad-spectrum aminopenicillins, for example, ampicillin and amoxicillin are of primary interest to dental practitioners. Specialized defense mechanisms, encoded by the acquired resistant genes, are utilized by bacteria for their survival in an environment in which antimicrobials are designed to kill them is an imperative part in this book.

The book then shifts its attention to greater number of gram positive bacteria responsible

for causing dental caries and the microbiological procedures, techniques and quality controlling over them. On the other hand, lesser contribution of Gram negative bacteria in caries has also been precisely mentioned.



**Photograph illustrating Antibiotic susceptibility test of *S. aureus* on MHA plate (Sensitive= ciprofloxacin-1, ceftriaxone-5, cotrimoxazole-6, gentamicin-3; Resistant= ampicillin-2, erythromycin-4).**

This book emphasizes that mandibular molars are more resistant towards caries as saliva maintains the super-saturation of calcium in plaque and also neutralizes acids, raises  $p^H$  and reverses the diffusion rate of calcium and phosphate towards the tooth surface. Globally, in the present clinical scenario, there is a great interest in the use of antimicrobial agents for prevention and treatment of dental diseases due to the spread of antibiotic resistance. Most of the Gram positive bacteria are susceptible towards gentamicin, ciprofloxacin, erythromycin and cotrimoxazole while Gram negative bacteria are susceptible to imipenem, ciprofloxacin, ceftriaxone and gentamicin is major involvement of this book.

Although the oral health policies and strategies are established, the limited fund resources and manpower are a constraint to

implementation. The book can act as necessary tool for necessary intervention program to monitor the spread of resistant bacteria and identify the common bacterial agent involved in caries. Moreover, the book will help health care authorities for further planning, implementation and evaluation in public dental health service by building the effective management program for it.

The book concludes highlighting dental public health crisis which should be strongly accessed with efficient use of regular oral hygiene dental care, both preventive and restorative. Oral health education, treatments in the correct time and public awareness, various dental problems under control can uplift the health status of the Nepalese people is a major contribution of this book. The book ends with recommendations and list of references.

The topic is, after all, an extremely important and interesting one. Essentially, this book is exactly what it says on the cover; Dental Caries: Bacteriological profile of dental caries. It's the kind of book where the reader is compelled to be go through it, is feat for author of this book. In fact, I enjoyed this book and have other things to do.

Language and grammar can be improved at some places in the book and the formatting can also be improved. Addition of photographs in book can further improve readability. This book will be of interest to all those readers who are broadly interested in tooth decay research, dentistry and all other dental health associates and particularly microbiology researchers in this field. This book might be an excellent introduction for entry level scientists, as well as those seeking a deeper understanding of this critically important bacterial pathogens involved in dental caries.

## **AUTHOR'S CONTRIBUTION**

**SP-** Was involved in reading the book, writing the review and revising it for critical intellectual content.

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**CONFLICT OF INTEREST:** The author of the book review has collaborated on many research projects and articles with the author of the book.

## **ABOUT THE BOOK:**

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