

Dental Education

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Challenging the status quo: The persistent resistance to the medical model of caries management by dental fraternity across the globe

Dental caries is one of the most common health challenges mankind suffers from. It is caused by the interaction between acidogenic and aciduric bacteria in the mouth and sugars/carbohydrates from edibles. The bacteria produce acid that causes breach in the protective enamel on teeth, leading to cavities. Since GV Black's days, dental caries has been treated through drilling out the carious tissue and restoring it with some biomaterial. Researchers termed it a 'surgical model' of caries treatment. It was, in fact, based on late clinical interception by the dental clinicians considering caries as an irreversible process of hard tissue damage and instead of treating caries, merely cavities were being treated. It has, over the period of time, shown many demerits including; inability to treat the caries as a disease, inability to reveal incipient caries and inessential sacrificing of natural tooth structure [1,2]. It, not only jeopardizes the strength but puts a tooth to a repeated restorative cycle that results in the restoration increasing in size each time it is changed, leading to eventual loss of the tooth [3]. A recently published consensus statement of experts in cariology from various countries vividly outmodes the Black's surgical model of caries management and stresses not to interfere with an inactive carious lesion. It recommends that active non cavitated lesions and cavitated cleansable lesion should be managed non-invasively. A cavitated lesion which is not cleansable, however, needs restorative management, to restore form and function of the affected tooth and aesthetics of the patients [4].

Deeper knowledge and research in cariology and formulation of newer biomaterials and induction of technology in dentistry, suggested a 'medical model' to replace the old concept [5]. It provides a useful background for understanding the biological processes underlying dental caries and developing effective prevention and treatment strategies. The medical model treats caries as a dynamic disease process influenced by multiple factors, including genetics, diet, and oral hygiene. Rather than merely treating the symptoms, this model aims to address the root cause of the decaying process to prevent its reoccurrence and progression [6]. It is based on early clinical intervention with emphasis on attempt to remineralize the carious lesion before it cavitates. In this new perception, dental caries is considered as a disease that can be prevented and treated through various interventions. Preventive measures such as regular brushing and flossing, a healthy diet low in sugar, and fluoride application can help minimize the risk of dental caries.

Current Caries management strategies, according to the medical model, involve a combination of preventive and therapeutic approaches. Risk assessment is the first step to assess the undertreatment patient's risk for developing tooth decay. This involves evaluating the patient's diet, oral hygiene habits, medical and past dental history [7]. Early detection of caries is crucial for minimizing intervention and delaying the restorative cycle of the affected tooth. Failure to detect early caries at an incipient stage progresses and later develops into cavities and increase the disease burden. A dentist, therefore, should be focused on the early and accurate detection of incipient caries

[8]. Visual examination and radiographs are considered basic tools for caries detection but they fail to determine caries progression and present low sensitivity rate in detection of early caries [9]. It has necessitated use of modern diagnostic tools based on technology like laser fluorescence, fibre-optic transillumination, electrical conductance and quantitative light-induced fluorescence to identify incipient carious lesions [10].

Prevention on patient's part, is the key to managing caries. This involves educating patients on proper oral hygiene habits, such as brushing and flossing, and reducing their risk factors for decay through diet modifications and the domestic use of fluoride in the shape of toothpaste, mouth rinsing and gum chewing. If decay is detected, the minimal intervention approach is recommended that involves using non-invasive techniques, such as fluoride varnish, to halt or reverse the decay process. In some cases, small cavities may be treated with minimally invasive procedures, such as resin infiltration or sealants. In some cases, antibacterial therapy such as silver diamine fluoride may be used to stop the progression of caries and prevent further decay. Chlorhexidine mouth rinses are advised to diminish the streptococci and lactobacilli count which reduce their anticariogenic activity.

An appropriate dietary advice for required modifications is also essential to stop further caries incidence. A diet low in sugar and refined carbohydrates can help reduce the risk of developing caries. Instead, diet rich in whole foods, fruits and vegetables that helps maintain good oral health is encouraged to be consumed. Post treatment monitoring is an integral component of the medical model. The dentist monitors the patient's prognosis through regular follow-up appointments and evaluates patient's oral health to ensure that the caries does not recur.

In the dental literature, numerous studies have shown widespread benefits of the non-invasive and conservative philosophy that seems quite obvious to most of practicing dentists, yet the practical integration of these principles into day-to-day clinical practices has not been widely accepted by them. Several reasons may be cited for the global resistance against acceptance of this model despite its potential benefits:

- **Traditional dental practices:** Dentistry has historically been rooted in surgical model based on restorative procedures. The shift towards a medical model threatens established practices and may require retraining and a change in mindset among practicing dentists.
- **Financial benefits:** Restorative procedures often generate significant revenue for dental practices. Embracing a preventive approach may impact the bottom line, leading to resistance from most of the dental practitioners [11].
- **Denying evidence:** While there is an increasing pool of evidence supporting the medical model, older practitioners remain unconvinced or unaware of the current research and evidence.
- **Lack of adequate training:** Existing dental education and training programs do not adequately prepare professionals to implement this model effectively. This knowledge gap contributes to skepticism and resistance.
- **Patients' attitude:** Patients are accustomed to the traditional, reactive approach to dental care and may be resistant to change or unsure about the effectiveness of preventive measures.

The medical model of caries management represents a promising paradigm shift towards a more holistic and preventive approach to oral health. However, its acceptance within the dental fraternity continues to face persistent resistance due to various factors mentioned above. Overcoming these challenges and fostering a greater understanding of the medical model's non-invasive and utility-driven approach is crucial for the evolution of modern dental care and the promotion of long-term oral health. Collaborative efforts among all stakeholders including dental professionals, educators, and researchers can help bridge the gap between tradition and innovation in caries management.

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