



BIOLOGICAL DENTISTRY: AMALGAMATING NATURE AND TECHNOLOGY

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ARTICLE INFO

Article History:

Received 14th February, 2021
Received in revised form
05th March, 2021
Accepted 19th April, 2021
Published online 15th May, 2021

Key Words:

Holistic Dentistry, Biological Dentistry,
Natural Dentistry, Alternative Dentistry,
dental herbs, Dental Nutrition and
Health.

ABSTRACT

Healthy is a state of physical, social and mental well-being. We can't qualify absence of disease as healthy. Thus, it becomes imperative to maintain a harmony between body, mind and soul. Dental health is directly related to mental and digestive health of a person and it can't be treated as an isolated disease or infirmity without considering its effects on other parts of our body. Traditional healing methods may be less effective in a few cases but has proven to be more holistic in nature when we look at overall health of a person. Modern doctors are utilizing these techniques and biological way of healing in tandem with modern medicine to eliminate the disease while keeping the reactive effects of medication in check. Biological dentistry has also been formulated on similar lines where modern dentists amalgamate ancient healing herbs and techniques with modern medicine and techniques to ensure overall wellbeing of the patient.

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Citation: Dr. Payal. "Biological dentistry: amalgamating nature and technology", 2021. *International Journal of Current Research*, 13, (05), 17251-17254.

INTRODUCTION

Natural dentistry, integrative dentistry, holistic dentistry, alternative dentistry and what more, Bio-dentistry is known with many names (FDI General Assembly, 2017). Roots to biological dentistry go deep into 1800s, when National Dental Association mandated that no members of NDA would use Mercury fillings as it has detrimental effect on overall health of a person. It was then recognized and implemented by many countries by late 19th century (Barrett).

The ideology behind bio-dentistry is that all areas of health are intertwined and treating oral health independently do not always solve the root cause. Dentistry in general deals with impact of oral health as far as head and neck region are concerned. However, bio-dentistry takes account of unrecognized impact of oral health on overall health (Nidhi Thakur, 2011). It amalgamates modern medical science with the traditional knowledge gained from traditions of natural healing from different part of world. Bio-dentist take individualistic approach to treating a problem, they treat every patient as a unique case and try to understand their specific problems. As far as treatment is concerned, they are advocates of least invasive dentistry.

They prefer biocompatible, safe and natural ways of treating the ailment (non-surgical methods). They have following four principles of treatment (Srnivasan, 2015).

-) Nutrition balance to counter degenerative dental disorder
-) Least usage of toxic dental materials
-) Fight Malocclusion at any cost
-) Treatment of gum disease at its biological basis (Rao, 2002)

While the holistic approach to dentistry has received applaud in terms of usage of natural ingredients and reducing side effect of dental treatments, it has also received criticism for lack of effectiveness of approach and lack of research backing of the concepts.

Components of Biological Dentistry

Biological dentistry follows following six principles

1. Biocompatibility- The materials used, or the procedure of treatment should not have any harmful effect on our body in the shorter or longer run. Chemical having toxic affect are not tolerable.

2. Bio-aesthetics- There must be a synchronism between aesthetics and dental function. Dental functions can't be compromised for aesthetic reasons.
3. Biochemical Balance- For healthy oral tissues, we must maintain saliva buffered pH balance bacterial along with bacterial balance.
4. Bioenergetics- ensuring well-being of a person physically and psychologically by therapies to release blocked physical and psychic energy.
5. Biomechanics- Biting and grinding teeth produces occlusal forces. These must be dealt with care as it affects sleep and thus can cause breakdown in tissue integrity.
6. Bioethics- Apart from everything else, it is of utmost importance to treat the patients with integrity, honesty and due care while keeping professional values of dentistry high.

Role of Ayurveda in Biological Dentistry: Ayurveda is one of the most ancient healing and medicinal practice originated in India. Now it has spread across the globe and is used in many geographies. Ayurveda has numerous ingredients and medicinal plants for dental health that has been proved to be safe efficient and no toxic through ages (Prathima, 2013). Various Herbs have therapeutic effects like anti-cariogenic, anti-bacterial, anti-inflammatory and anesthetic effects. It enables them to be used as a storage medium for avulsed tooth, mouth rinse and root canal irritants. Herbal tooth powder and paste have been made in Ayurveda using specified formulations of herbs like bark and leaves of Neem, clove, grape seeds, chamomile, echinacea, sage, peppermint and fennel. These are found to be as effective as modern toothpastes. Toothbrushes made of herb sticks have been very popular in ancient time and is being used in various villages of India still. It has been proved by the studies of Kadam et al that these sticks anti-carcinogenic and medical properties (Patil, 2013). Sticks made of 'Kashaya', 'Katu' or 'Tikla' have that are recommended for receding and atrophic gums while sticks made of Arjuna tree and milkweed plant are recommended for pale hypertrophic gums.

'Kavala' and 'Gandoosha' are two traditional herbs user for oral cleansing that helps in preventing as well as curing oral diseases. Neem and Tulsi also have medicinal effects on tooth. Neem has anti gingivitis and anti-plaque effect. Its mouth wash is as effective as Chlorhexidine in reducing periodontal indices. Methanol leaf extract of Tulsi significantly inhibit bacteria and fungi. Study done by Subhranian in 2014 proved its effectiveness against human pathogens like *Escherichia coli*, *Staphylococcus Aureus* and *Candida albicans*. Ulcerations were treated by Propolis, a bee glue that is also used to contain infection, burns and wounds (Vigarniya, 2018). Many herbs are effective tissue regeneration therapy. A commonly known herb Amla is considered regenerative for tooth and gums. Regular consumption of a few grams of Amla have long term benefits enhancing development and healing of connective tissue. Regular consumption of Hawthorn berry and Bilberry emboldens gum tissues and stabilizes collagen. To stimulate proper growth of joints and skeleton, herbs like Cinnamon bark, Turmeric root and Alfalfa leaves are very effective. All these studies and observation clearly suggests that Ayurveda must be integrated with modern medicinal therapy and modern dentists should be encouraged to use biological ingredients in place of chemical medicines as these have similar effect with no side effects. It becomes essential in

case of pediatric dentistry where side effects can prove really detrimental.

Aromatherapy in Biological Dentistry: Aromatherapy is widely used in managing and inhibiting emotional distress. This has a positive effect on apprehensive patients who are going through dental procedures. It has also proved successful in treating ulcers and toothaches. Aromatherapy utilizes plant extracts, essential oils and herbs individually as well as in combination (Arshia Rashid Baig, 2017). There are lot of anxiety arousing factors in dental clinics like needles and other instruments, smell of implant material and others. Studies have proved that aromas can lessen awareness, temperament and anxiety inciting activities. It is scientifically proven that odours have the ability to alter/change emotional states as essential oil contains pharmacological properties that are responsible for emotional states. It activates olfactory nerve cells in nasal cavity and also sends impulses to the brain resulting in rise in response to fragrance. Thus, it helps people to sweep in relaxed and calm mood during any dental procedure. Lavender, Basil, Bergamot, Sandalwood are generally used for such purposes (Jimson, 2016).

Homeopathy in Biological Dentistry: Homeopathy is the second largest medicinal system recognized by World Health Organization. It is mostly used in dentistry to improve emotional and psychological condition by affecting hormones and enzymes. Although the remedy claims are not backed by systemic reviews, but many clinical trials and case studies supports its effectiveness for oral and maxillofacial benefits.

Homeopathic remedies and medicines are available for ulcers, neuralgia, sialorrhea, temporomandibular joint disorders, lichen pain and bruxism (Khajavi, 2015). It is effective in conditions affecting orofacial structures. A few examples are Belladonna, Aconite foxglove, Borax Arsenicum Album etc. Belladonna is used for toothaches and early abscess. Aconite foxglove is affective in trigeminal neuralgia. Arsenicum Album is given in the cases of gum bleeding and pulp periapical region diseases. Most important thing about these medicines are that these don't have any side effects like Ayurvedic medicines.

Connection between Nutrition and Dental Health: The dental health has an intimate connection with person's diet. It is quite surprising that dentistry in general is not concerned with what we eat. It is generally observed that dental health gradually deteriorates as natural food is replaced with refined food. Minerals such as calcium, magnesium, zinc, copper etc. are essential for dental health that are not present in refined food. Acidic food like sodas or sweetened beverages, processed food, high protein food and supplements further removes these minerals and can lead to bone loss. Connection between dental caries and carbohydrates is one of the most common connection that we can observe around us. Hard tissues are demineralized by by-products produced by bacteria in dental plaque via fermentation of dietary carbohydrates. Different carbohydrates affect caries differently as it depends on the extent of metabolization of bacteria that ferment it. Sugar is the most detrimental carbohydrate for tooth. Sugar causes plaques on the teeth and gum where bacteria proliferate and causes destruction of teeth. Fruits that are plucked unripe have both ingredients, sugar as well as fruit acids. These can be dangerous for dental health. Dental caries along with erosion or periodontal diseases are highly affected by our diet

intake. Deficiency of vitamin A and D causes enamel hypoplasia. Malnutrition also decimates innate and adaptive defenses of the person and thus makes the person susceptible to oral infections (Esposito *et al.*, 2019). Vitamins D affects metabolism of calcium and phosphate. It has been observed that higher prenatal intake of vitamin D reduces risk of caries in infants. Vitamin C is needed for repair of various tissues including teeth. Its deficiency causes bleeding and bruising of gums near teeth. This special condition is also termed as Scurvy (Moynihan, 2014).

Tooth Decay and Dental Filling Material: Holistic dentists believe that tooth decay is not necessary and can be prevented quite easily by combining a nutrition program with dental hygiene (Bill Wolfie, 2015). Holistic approach reprimands fluoride treatment to prevent tooth decay specially in children as it can have detrimental effects on child's neurological health at high level of exposure. Holistic dentists are concerned that it can be dangerous at lower concentration as well. They prefer Xylitol, a sweetener that suppresses the ability of a bacteria to cause dental decay. Lesser the pH, more are the chances of decay as acidity helps in the decay of carbonates. There are concerns around eating highly citrus fruits if the decay is likely. If the decay is diagnosed early, its treatment becomes more affective and easy. By using a laser called 'Diagnodant', decay can be discovered early. Exposing these areas to ozone can disinfect the area and stop the decay from spreading. If the tooth is decayed, the standard material that is used for dental filling is Mercury-silver amalgam. Use of this material have been in discussion since 18th century, its readily available, quick setting and of adequate strength but it has multiple detrimental affect on the human health. A few of them are listed below:

-) Mercury is a highly toxic material and is associated with brain and the nervous system. Placing this in mouth will certainly cause a part of it be leached and go into stomach. Mercury can vaporise easily during chewing and thus go into the brain as well.
-) Mercury as a filling material doesn't give strength to the tooth as a composite resin can give. If filled in an already weakened tooth, it may cause cracking.
-) Placing metals in our mouth have a possibility of generating static charges that can react with Saliva to produce current. Any electric charge generation near to brain is not advisable
-) Other metals used in the amalgam like silver, cadmium, copper are equally toxic and shouldn't be placed in a person's mouth.

The alternatives to amalgam is resins and ceramics but no filling material is perfect. These materials might not have germ killing capability of mercury and would need more precise technique for placing it correctly in the mouth. But on the other side, these materials are glued to the tooth and provide strength to the decaying tooth. And above all, the toxicity of such materials are much lesser (Ron Ehrlich, 2017). If composite fillings wears down or gets damaged, it need not be replaced completely. You may just add another layer of resin to the filling. It also has better aesthetic quality as the colour of the composite is similar to natural tooth. Apart from mercury, there are other metals like nickel that should be avoided in dental wires & appliances, bridges, crowns and other dental uses. Nickel is a highly toxic material but is used due to its strength. Nickel can cause depression, suicidal thoughts and in

some cases cancer as well. Alternative to nickel can be titanium and zirconium. Recently, resins and ceramics are being used and are much less toxic.

Dental Implants: In case tooth has advanced decay, injuries or accidents and can't be repaired with a filling, dental implants are used to replace missing tooth or to repair damaged tooth. Although it is not advisable to use metals in the mouth but Titanium has been the best option available. A cavity is drilled in the tooth for the posts that are inserted and glued into bottom of the tooth. Then the moulded implant is attached to the posts. Once everything fits right, implant is glued to the tooth.

Root Canals: Root canal is needed when bacteria has made its way deeper in the tooth. If left untreated, it can run into jawbone and may be beyond. This has been very popular for centuries and has proven to be safe and effective. For cases where bacterial infection has gone beyond repair and pulp tissue is infected, there are two options, either to extract to or to do root canal treatment. It is advised to replace the missing tooth, not just for aesthetical reasons but for oral health and to prevent other teeth from shifting. Root canal can save an infected tooth, infected tissues are removed and remaining tooth is disinfected and the infected area is sealed to prevent re-infection. If we have many advantages of root canal then why holistic dentists don't support it? A deal organ or tissue if remains inside the body always creates problems and leads to various illness. They point out that root canal can't be safe until 100% of the remaining tissues are sterilised and made bacteria free (Ron Ehrlich, 2017). It is practically impossible to 100% sterilise the canal. Another argument is, the chemicals used for sterilisation such as formaldehyde are toxic and the bacteria left behind can have serious adverse effect like heart disease, breast cancer and more.

Periodontal Problems or Gum Disease

Biological dentists prefer non-surgical natural ways of treating gum diseases periodontitis. Gum diseases are very common and are treated through surgery known as scraping the gums. Biological dentists consider this to be the last resort. They first alternatives, a few of them listed down below (Srinivasan, 2015).

-) Gum diseases responds to nutritional balancing very effectively. Faulty eating habits results in infection in mouth. Toxic metals like copper, zinc and cadmium are also involved. A good dental hygiene combined with a nutritional program can help cure such problems
-) Blotting is another technique that is very effective in this regard. It involves using a special toothbrush that toxins into its bristles while the usual toothbrushes push the toxins inside the gums

Temporomandibular Joint Problems: If a person's dental arch and bite is not proper, the person will be susceptible to improper tooth wear and chewing. This can cause headaches, jaw pain and other problems. The bone structure of the peripheral areas must be aligned properly for a proper dental arch. Otherwise, it becomes narrow resulting in improper bite and chewing. Temporomandibular joints are located just below the ears from where jaw pivots to open and close. Misalignment of these joints are commonly observed. People can hear a low clicking sound if this is misaligned. There are

various facial exercises, appliances and dental adjustment to the teeth that can help correct this disorder. An overall improved health also helps in less tensed jaws.

Fluoride: Conventional dentists have always supported the use of fluoride. They follow the research that shows lesser cavity rates if fluoride is used and prescribe it to infants even. Holistic dentists are against any type of fluoride ingestion as link of fluoride to cancer and other bone related issues. Another concern is excessive fluorosis. Public water supplies also contains fluoride, giving fluoride medication can result in overdose.

Conclusion

There are multiple scenarios where conventional dentistry is being challenged and unconventional and other alternative methods are proving to be reliable and effective in solving the problem while minimising the reactive medical risks. Although the notion of conventional and biological dentistry is philosophical, the latter is becoming more and more popular due to its holistic view of overall health of an individual. It is always important to look at mouth, teeth, gums and jaws as an integral part of our body while treating it. Patients treated by biological dentist will have a healthy life and not just healthy teeth.

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