

## Oral Systemic Relation and Oral Medicine: Review Article

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### ABSTRACT

The field of oral Medicine is a speciality which is unique in reflecting Oral systemic relation. The most interesting aspect is that it serves a window to the human body. The role of oral medicine in diagnosing and treating human pathologies have a diverse role both pertaining to the maxillofacial area per se and also the overall health of the human body.

**Key words:** Oral diseases, oral medicine, systemic relation.

### INTRODUCTION

The fundamental fight back solution against any pathology is a scientific blessing-Diagnosis. In ancient days it was reflected by the wise human brain with the triad of rationale thinking, experienced knowledge and judicious approach which today glows with multifarious technological dimensions most promisingly reflected by the field of Medicine.

The field of oral Medicine is a speciality which is unique in reflecting Oral systemic relation. The long journey of adventures in the emergence of oral medicine dates back to 25,000 years ago when evidence of tooth decay were noted in the skulls of Cro-Magnon people and the evidence of Acupuncture by Chinese to treat pain associated with tooth decay in 2700 B.C<sup>1</sup>.

The broad horizons of Oral medicine dates back to 1839 when Brown first made emphasis of the systemic effects on oral

tissues<sup>2</sup>. Henceforth the significance of Oral manifestations of systemic diseases and thereby establishing the oral systemic connection<sup>3</sup>. Also historically Roentgen's accidental discovery of x-rays when experimenting with cathode radiation has today crossed mile stones<sup>4</sup>. Beyond serving as an essential investigation in many needful circumstances, it has served to discover occasionally the silently existing pathologies during routine examination. The pioneer to bridge dentistry to systemic health was Dr .Horace Wells, a dentist who demonstrated insensitivity to pain from dental extraction on 11<sup>th</sup> Dec 1844 by using nitrous oxide anaesthesia which was initially discovered by Joseph Priestley in 1772<sup>5</sup>. As a reflection of the same this paper deeply reflects Oral medicine as a career choice focussing especially on research and its application.<sup>6, 7</sup>

### Oral systemic relation and oral medicine

Ideally, the most promising point in a field lies in establishing connection with human body as a whole. As a tip of the iceberg, the following is a

focus of 12 fascinating fables depicting the role of oral medicine in oral systemic relation.

### **Depression and brain pacemakers**

Many chronic pathologies including those of oral and maxillofacial region may be occasionally incurable and without significant aetiologies resulting in behavioural disorders such as depression. Smile is a blessed expression and a dentist plays a significant role in this context. But the sensational part of smile is that occurring from within which certain groups of patients suffering from depression fails even after all possible medical and surgical treatment modalities.

Neurologists have speculated that in such hopeless patients there are abnormally high levels of activity in the CG25- Subgenual cingulate area known as the sadness centre<sup>8</sup>. To overcome this and to provide a sparkling recovery is a new dimension in neuropsychopharmacology –Brain Pacemakers- which by the principle of DBS- Deep Brain Stimulation<sup>9</sup> -retunes and remodulates the activity of the diseased brain and corrects the diseased messages responsible for the miserable behavioural disorder and succeeds in bringing a smile from within<sup>10</sup>.

### **Grabbing the crab – cancer in a triangular trap nanotechnology in cancer**

#### **Dendrimers**

They are a unique form of Nanotechnology which arises as a hope from the myriad of new treatments, for cancer<sup>11</sup>. It employs the cunning trick of Trojan horse strategy wherein the dendrimers serve as smugglers in carrying the anticancer agent to the cancerous cells specifically; thereby sparing the adjacent normal cells<sup>12, 13</sup>.

#### **Quantum dots**

They are tunable fluorescent nano particles made of cadmium selenide which glow when exposed to u-v light and are useful in the detection of cancer in very incipient stages and preferentially killing them<sup>14</sup>.

#### **Nano-bubbles**

They help in singling out individual diseased cells and destroy them with tiny explosions<sup>15</sup>.

### **Figuring irregularities - fractal dimension analysis in cancer**

Flawless quantification of the irregularities as in case of cancer growth is made possible by using fractal geometry; which provides a highly précised approximation of shape complexities and irregularities. Thus, nuclear fractal dimension serves as a promising prognostic factor in cancer, including oral squamous cell carcinoma<sup>16</sup>.

### **rescuing the painful joints – prolotherapy in TMJ**

Striking a balance between the senile joint pain and the stress related joint pain especially experienced by the today's 24x7 professionals is a scientific advance known as Regenerative Injection therapy (or) Proliferative Injection Therapy popularly referred to as Prolotherapy.

This technique involves injecting a non-pharmacological and non active irritant solution referred to as Proliferant solution comprising of dextrose, lidocaine, phenol, glycerine/ cod liver oil extract in the region of tendons (or) ligaments for the purpose of strengthening weakened connective and alleviating musculoskeletal pain. It differs from the currently existing therapeutic modalities in that it induces inflammation and causes the body to heal itself through the process of inflammation which causes the release of growth factor and helps in repair and regeneration.

It has proven to be useful in unresolved and chronic neck pain, knee pain, low back pain and the most challenging pain in TMD (Temporo mandibular dysfunction) associated with TMJ disk displacement, TMJ arthralgia and related Orofacial pain<sup>17</sup>.

### **The enigmatic environment envying genetics Epigenetics in cancer**

Contrary to conventional genetics, an important discovery in science of hereditary is Epigenetics which is the study of changes in gene activity that do not envisage alterations in the genetic code but still get passed down to atleast one successive generation.

The fundamental concept involved is DNA Methylation and Histone Modification. Methyl group (an epigenetic factor) found in diet can express (or)

repress the genes. The binding of this epigenetic factor to the histone tails alters the extent to which DNA is wrapped around the histones and the availability of genes in the DNA to be activated.

In context with cancer, aberrant DNA methylation appears as global hypomethylation accompanied by region specific hypermethylation respectively resulting in chromosome instability and inactivation of tumour suppressor genes. And thus reversal of abnormalities in DNA methylation may help to restore the tumour suppressor function of the genes and provide a novel approach to cancer therapy<sup>18</sup>.

### **Venerable human body and virtopsy in forensic imaging**

Respecting deeply the human body even after death, in exploring the cause of death is VIRTOPSY - a recent advance outshining conventional autopsy. It is basically a procedure employing a non-invasive scalpel free technique preserving the body architecture and also the data being stored in digital format serving internationally for cross opinions and legal formalities.

More important of all is that it holds better acceptance for the relatives of the deceased and also satisfying the religious customs of few, as incisions are replaced by three dimensional surfaces scanning with multi-slice computed tomography and magnetic resonance spectroscopy which reflects the moral shadows in the world of forensic imaging<sup>19, 20</sup>.

### **The imperishable identity - tooth and the intangible field forensic dentistry**

Identification of unknown by teeth dates back to 66 A.D. The interesting fact is that the tooth is the hardest structure withstanding temperatures even as high as 1600 Celsius and thereby resisting potentially destruction and decomposition for considerable periods after death<sup>21</sup>.

### **Healing nature's curse by nature Phytochemicals in H.I.V**

Phytochemical are plant derived chemicals that portrays traditional medicine. A highlighting role of it is in AIDS, wherein Alpha terthienyl is an emerging landmark in anti-retroviral

therapy. It is a naturally occurring secondary plant metabolite found in abundance in the roots of plant trithiophene.

Its anti-viral activity is related to its activation by UV light (320-400nm), once activated it generates oxygen radical species which have the capacity to inhibit several enzymes including that in potentially disastrous HIV<sup>22</sup>.

### **Saliva and the necromancy in diagnosis**

The magical use of saliva in the field of diagnosis is multifaceted. Dr. Nikita Pant Pai from Marina Klein's research team has contributed a new test based on Oral Mucosal Transudate – a fluid secreted at the base of the gums before it becomes saliva. It is a breakthrough budding rapid saliva test in HIV detection<sup>23</sup>. Also as an optimistic weapon in predictive medicine, the assessment of secretor status secreting the ABH antigens into body fluids and secretions including saliva represented by the secretor gene is an enlightening landmark with respect to the susceptibility to diseases<sup>24</sup>.

### **Surpassing senescence: rapamycin a scientific surprise**

Researchers believe that a protein called progerin present in small amounts in normal cells may be partially responsible for the aging process. Rapamycin, an immunosuppressant drug used to prevent rejection of transplanted organ has been found to be effective in degrading this protein. Experimental data in patients with Progeria, a fatal genetic disease that resembles rapid aging (premature senility) is a reflection of rapamycin as an anti-aging agent- a highlighting advance in research in extending the life span<sup>25</sup>

### **Personalized medicine and theranostics**

Theranostics is the term used to describe the proposed process of diagnostic therapy for individual patients- to test them for possible reaction to taking a new medication and to tailor a treatment for them based on the test results. Personalised medicine is the use of detailed information about a patient's genotype or level of gene expression and a patient's clinical data in order to select a medication, therapy or preventive measure that is particularly suited to that patient at time of administration. The test results are used to tailor

treatment, usually with drug that targets a particular gene or protein. This method is looked as the possible end result of new advances made in pharmacogenomics, drug discovery using genetics, molecular biology and microarray chiptechnology<sup>26</sup>.

#### Ethics in research: stem cell research

Research almost always arouses controversies which are debatable & stem cell research is no exception. Stem cells are unique in that they have that ability to divide and multiply indefinitely and can differentiate into almost any cell type with a potential to cure a great range of debilitating diseases including cancer. However the destruction of the 1 week old embryo in the process of procurement of stem cell is considered highly controversial.

But considering the positive potential of the stem cells- tiny clusters of human cell tissues in

the cure of the hopeless incurable diseases, research overshadows ethics<sup>27</sup>.

#### CONCLUSION

Mouth is the mirror of the body. An Oral medicine specialist by virtue of rationale understanding and innovative decision making potency can be the first to identify any systemic disease and thereby render the best service to mankind. This can be accomplished more efficiently by incorporating generalpractise residency programme which may help to stablish the oral systemic connection. The main goals include providing multidisciplinary oral health care for wide variety of patients by functioning effectively with interdisciplinary health care teams involving critical thinking and evidence based clinical decision making and technology based information retrieval system thereby providing Oral health care in harmony with medical environment.

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