

A STUDY TO ASSESS AND CORRELATE THE EXISTENCE OF GOLDEN PROPORTION BETWEEN FACE AND TEETH

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Abstract

There is a universal standard for facial beauty regardless of race, age, sex, and other variables. Regardless of how attractive the teeth appear in isolation if spatially they don't correlate to the rest of the facial structures, then the overall impression will not be aesthetic³. Our intent in this study is to use a universal standard for facial beauty which will significantly help us in rehabilitating facial disharmonies and abnormalities and also help us as a guideline in variety prosthetic restoration. A total of 214 students from SDM college of dental science, Dharwad between the age of 18-25 years with maxillary incisors and canine presenting with anatomic integrity and faces with no facial deformity, participated in the study. Frontal photograph of the face under uniform and standard is to be set up. Digital management of the photograph was undertaken using Adobe Photoshop cs. Out of 214 photographs, beautiful/attractive faces were selected with vas (visual analog scale).30 dental professionals participated in the study. Out of 214 photographs, 30 photographs were selected for attractive faces. Facial proportion and dental proportion with certain measurements were measured individually and statistical analysis was performed on the data to look for correlation. Within the limitations of the study, we concluded that: 83% of the sample size showed the presence of golden proportion existing in the teeth, only 40% of the sample size showed the presence of golden proportion in the face, only 33% of the sample showed golden proportion both in face and teeth

Keywords: Golden proportion, Aesthetics, Smile Design, Attractive smile, Attractive face, Attractive anterior teeth 3

Introduction

Beauty is power; a smile is its sword- Charles read. The human face is a unique structure which allows a person to have a distinct recognizable facial identity.

The human face is a very important element in defining the beauty of an individual. Although beauty lies in the eye of the beholder, being attractive is becoming trendier in recent society and there have

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been studies which show that self-confidence is related to perfect physical appearance 1. Principles of smile design incorporate the esthetic concepts that harmonize with both facial and dental esthetics 2. Leonardo da Vinci said-“no human inquiry can be called science unless it pursues its path through mathematical exposition and demonstration” 3. One of the critical aspects of esthetic dentistry is creating geometric or mathematical proportion to evaluate various measurements related to beauty. Golden proportion, golden percentage, and recurring esthetic dental are theories introduced in these field 3. Many guidelines, norms, and standards have been proposed in order to describe ideal proportions for the human face and for the longest time golden proportion has been observed in the human face⁴. Living organisms are all biologically engineered to conform to this proportion. Man-made items and structures, all of them appear to be directed to conform to this divine proportion. Even more amazing, nonliving, dynamic entities also conform to the divine proportion. Divine proportion can be seen everywhere in nature. Art, architecture, fashion, birds, insects, and flowers are some of the examples in which we can find the golden proportion. even our DNA, ECG and credit cards conform to the golden proportion⁵.

Patients seeking prosthodontic treatment are very much concerned about their aesthetics. The dental esthetic evaluation starts by observing various facial elements. However attractive the teeth appear in isolation, if they don't relate to the rest of the facial structures then the outcome⁴ of the treatment is not aesthetically pleasing. Esthetic dentistry can only be achieved if dentist understands how the teeth relate to other facial structures and use this information in the fabrication of restorations⁶. The art of judging an

individual's character or personality by the appearance of their face is termed as physiognomy. If physiognomy plays a part in assessing people, the teeth are very important facial landmarks. This is termed as dentofacial physiognomy⁷. Establishment of a universal standard for facial beauty will significantly simplify the diagnosis and treatment of facial abnormalities and deformity. These standards will help us enhance facial esthetics, TMJ functioning, health, fertility and quality of life⁵. We can achieve a valuable tool to help us design esthetic restorations.

Materials and Methods:

214 photographs were taken with Nikon DSLR 200 camera with 105mm micro lens ratio 1:1f/2.8 digital camera. The age varied between 19 and 26 years. The subjects were explained that their participation in the survey was completely voluntarily. The study protocol was explained to the subjects and. Consent was received from each person before clinical examination. The exclusion criteria for face were the absence of any dentofacial abnormality, any surgical treatment to enhance beauty, any kind of scars on face and any systemic conditions. The exclusion criteria for teeth were the absence of fractured teeth, any kind of dental abnormality, missing teeth and orthodontically or prosthodontically rehabilitated teeth. The photo was taken with the head in the natural position, such that the pupillary line was parallel to the floor and median was adjusted to the center of the camera lens. Subjects were asked to smile displaying their teeth. The photos were downloaded on a computer and we use the program adobe Photoshop cs5, to perform the necessary measurements. We measured the number of pixel per cm using the zoom function of the program so that we could measure the apparent mesio-distal width more accurately⁸.

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The photographs were assessed for beautiful faces. The visual analog scale was used to assess for beautiful faces. 30 dental professionals participated in this study. The photographs which had a mean score of 60 and above and small standard deviation of 3.45 were selected. Out of 214 subjects, 140 were women and 74 were men, 30 photographs were selected for attractive faces

The face can be divided into horizontal thirds .the extensions of the upper third are from the subnasale to the menton. Middle third extends from glabella to subnasale and the lower third 5 extends from subnasale to the menton. the facial measurements are made according to these horizontal third 7.

Results

- 1) 83% of the sample size showed the presence of golden proportion existing in the teeth
- 2) Only 40% of the sample size showed the presence of golden proportion in face
- 3) Only 33% of the sample showed golden proportion both in face and teeth

Discussion

Beauty and facial attractiveness can be identified easily but it is very difficult to quantify. Despite the fact that it is a very subjective nature, we can make an attempt to define, measure and describe numerically and geometrically the captivating phenomenon of beauty. Golden proportion also known as divine proportion is the key to all the mystery which is associated with aesthetics, attraction, and human beauty⁹. Lombardi was the first who examined the application of golden proportion in dentistry⁸. It should be well understood that the soft tissues present superficially on the face is not enough for the face to appear beautiful. It is very important for the facial-skeletal structures to be aligned well for the soft tissue to conform to hard tissue. When we adhere to this principle, the faces will not

only be more beautiful but will also be more healthier⁹.

It is a known fact that facial characteristics have a correlation between the teeth shape, size, and contour. The intent of our study is to illustrate the significance and existence of golden proportion in teeth and face. Levin in 1978 explained the history of golden proportion and its mathematics. Our profession is primarily concerned with how this proportion is related to esthetically pleasing dentition and smile. Mack has also discussed how important it is to treat the dentition according to the face based on divine proportions⁵. The study which was conducted showed only 33% of correlation between face and teeth.

Levin had observed golden proportion between face and teeth. George and Bhat had found that golden proportions are a reliable predictor for determining the width of the central incisor in south 6

Indian population. About 83% of our sample size had the existence of golden proportion between the incisors.

Preston had found only 17% of the study samples that had golden proportion. Mashid et al had also reported the lack of existence of golden proportion between the maxillary anterior teeth, this study was later substantiated by Ward, Gillen et al and Rosensteil et al. Ratio between central and lateral incisors and between lateral incisor and canine are not constant¹⁰. The study which we have conducted doesn't correlate with these studies probably because we have measured golden proportion only in attractive and beautiful faces only.

Faces that are attractive generally follow the facial third concept. It was found that an optimal balance in attractive faces follows this proportion. Very few changes can be done dentally to structurally affect the upper third of the face. Whereas the lower third of the face can be increased

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relative to the upper third⁶. Jefferson Y in 1996 had found golden proportion present in the face. Jefferson presented a beautiful face of the female model and stated that the facial form and balance is directly related to divine proportion. He claimed that a face is beautiful if the length of the face (to-me) is 1.618 times the face width, i.e. between right and left borders of cheeks⁵. Ricketts was the first to analyze beautiful faces mathematically and advocate the use of golden proportions in models. Moss et al had done a study and found that professional models did not conform to divine proportion. Our study showed only 40% off the sample size having golden proportion present in the face⁹. A Perfectly symmetrical face does not always correlate to a beautiful face. However, a divinely proportioned face will always be beautiful ⁹.

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