

ASSESSMENT OF FMR PATIENTS BASED ON TURNER AND MISSIRLIAN CLASSIFICATION- A RETROSPECTIVE STUDY

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ABSTRACT

The objective of full mouth rehabilitation is not only the reconstruction and restoration but also to maintain the health of the entire stomatognathic system. Full mouth Rehabilitation can be defined as the reestablished state of functional and as well as biological efficiency where teeth with their periodontal structure, the muscle of mastication and the TMJ mechanism all function together and in synchronous harmony. Tooth material loss (wear) occurs as a natural process during the lifetime. In some cases tooth wear is severe and there will be a decrease in the vertical dimension. Hence it is mandatory to evaluate the vertical dimension before further treatment planning. So this present study aims to assess the patients requiring Full mouth Rehabilitation based on Turner and Missilarian classification. patient records were analyzed with the data of 86000 patients between June 2019 and March 2020 from this a sample size of 65 patients were selected for the study. Data tabulated with parameters such as age, name, gender, classification of Turner, and Missilarian classification and their categories. Data import to SPSS for statistical analysis. Descriptive statistics having a frequency, percentage, and chi square test done for association. Male is found to be slightly more prevalent than females. The most common age group affected were above 50 years of age group with categories-2 was more frequently seen. Chi-square test showed no Statistical significance between age/gender with the diagnosis of Turner and Missilarian categories since p value > 0.005. Turner and Missilarian classification category 2 was found to be more in males above 50 years of age group. This study needs further extensive research with a large sample size in the future.

KEYWORDS-Tooth Wear, occlusion, partial Edentulous, Rehabilitations, TMJ

INTRODUCTION

The main objective of full mouth rehabilitation is not the reconstruction and restoration of teeth, but also to maintain the health of the entire stomatognathic system. Full mouth rehabilitation should re-establish a state of functional as well as biological efficiency where teeth and their periodontal structure, the muscles of mastication, and the temporomandibular joint (TMJ) mechanism all function together in synchronous harmony. The proper evaluation followed by a definite diagnosis is mandatory as the etiology of severe occlusal teeth wear was multifactorial and variable. Attrition, erosion, and abrasion results in alterations to the tooth and manifest as tooth wear. Attrition is defined as the loss of enamel, dentin, or restoration by tooth-to-tooth contact, Abrasion is the loss of tooth substance from factors other than tooth contact. Erosion is chemical dissolution to the tooth substance caused by acids and unrelated to the acid produced bacteria. Erosion may occur due to the intake of acidic food and drinks, or medical condition involving repeated regurgitation and reflux of gastric acid. Adults lose teeth for many reasons, ranging from trauma

(accidents) to gum disease, bacterial infection tooth decay, bruxism (grinding), and misaligned teeth (Selvan and Ganapathy, 2016; Basha, Ganapathy and Venugopalan, 2018). Dawson stated that interocclusal space is never lost and any loss is compensated by tooth eruption, alveolar bone expansion, and muscle action (Dawson, 2007). Success in maintaining severe wear cases depends on the development of proper incisal guidance to allow for proper disocclusion within a patient's envelope of motion. Tooth wear indices are useful tools for carrying out epidemiological studies and for general use in dental practices. Therefore, it is important to recognize the factors which produce excessive wear and reduced vertical dimension of occlusion.

The various classification has been given to classify and to differentiate the patient requiring full mouth rehabilitation (Hattab and Yassin, 2000). However, the classification which was most widely accepted was given by Turner and Missirlian. According to the patients with occlusal wear can be broadly classified as follows: (XMind Ltd, no date) (Turner and Missirlian, 1984) Category 1 – excessive wear with loss of vertical dimension. Category 2 – excessive wear without loss of vertical dimension of occlusion but with space available. Category 3- excessive wear without loss of vertical dimension of occlusion but with limited space available (Butler, 2018).

Category 1- The patient in this category has few posterior teeth and unstable posterior occlusion. There is excessive wear of anterior teeth. Closest spreading space of 3 mm and interocclusal distance of 6 mm. there is some loss of facial contour that results in the dropping of the corners of the mouth. Patients with dentinogenesis imperfecta with excessive occlusion attention and in the third decade of age and appearing prognathic in centric occlusion also belong to this category. Closest spreading space of 5 mm and interocclusal distance of 9 mm indicate that there is a loss of vertical occlusal vertical dimension (Song, Park and Park, 2010).

Category 2- The patient has adequate posterior support and history of gradual wear, closest speaking space of 1 mm, and interocclusal distance of 2-3 mm. The continuous eruption has maintained occlusal and vertical dimension leaving insufficient interocclusal space for restorative material. Manipulation of the mandible into centric relation will often reveal significant anterior slide from centric relation to maximum intercuspation. (Song, Park and Park, 2010)

Category 3- Posterior teeth exhibit minimal wear but anterior teeth show excessive gradual wear over a period of time. Centric relation and centric occlusion are coincidental with the closest speaking space of 1mm and interocclusal distance 2-3 mm. It is the most difficult to treat because vertical space must be obtained for restorative material to acquire knowledge on which age group is more prevalent for the risk (Song, Park and Park, 2010).

CLINICAL PROBLEM

Aesthetics- Often a patient is only aware of Tooth Surface loss when there has been a deterioration in the appearance of the teeth. The earliest changes are because of the loss of enamel. This may cause an increase in tooth translucency, both interproximally and at the incisal edges (Kannan and Venugopalan, 2018). **Conservation of tooth-structure-** The loss of tooth tissue is often substantial and the need to conserve the remaining tooth structure is vital. This is particularly important in the young, where tooth tissue is at a premium because of the lack of secondary dentine (Song, Park and Park, 2010). **Sensitivity and pain-** Exposure of dentinal tubules and their subsequent bacterial colonization can lead to both pulpal inflammation and sensitivity (Ariga *et al.*, 2018). **Inter-occlusal space-Tooth surface loss (TSL)** is compensated by alveolar growth which maintains the occlusal vertical dimension (OVD). However, if the rate of loss is greater than the compensatory mechanism then the OVD is reduced. The effect of

tooth surface loss on the occlusal vertical dimension is neither predictable nor uniform(Lee and Shin, 2014)

MANAGEMENT

Identify aetiological factors, Protect remaining tooth tissue. Direct application of glass ionomer and/or composite to sensitive areas(Subasree, Murthykumar and Dhanraj, 2016). Some patients come with the complaint of attrition in the frontal region of teeth, for that it was decided to restore the metal-ceramic fixed denture as an esthetic take as consideration(Darbar and Hemmings, 1997). If the severe tooth surface loss on the occlusal and incisal surfaces of maxillary and mandibular teeth due to aging, Dental treatment was extensive and required interdisciplinary care(Ashok *et al.*, 2014)(Venugopalan *et al.*, 2014).. The VDO and VDR of the patient were measured and the difference between 2 measurements were 4 mm(Hemmings *et al.*, 2018). Diagnostic casts were made and mounted in centric relation.(Ajay *et al.*, 2017).. To increase the VDO, an occlusal splint for the maxillary arch was made using auto-polymerizing acrylic resin. The splint was made 4 mm thick to increase VDO as VDR with canine protected occlusion(Sato, Hotta and Pedrazzi, 2000). Once we got the space, prosthodontic treatment started under which dentist will place a metal-ceramic crown(Jyothi *et al.*, 2017)(Setyowati and Kusdarjanti, 2017).Replacing loosening natural teeth with fixed prostheses supported by dental implants often requires either gingival surgery or bone grafting(Duraisamy *et al.*, 2019)(Ganapathy, Kannan and Venugopalan, 2017).Full mouth reconstruction typically involves general or restorative dentists (performing procedures like crowns, bridges and veneers), and can incorporate dental specialists like periodontists (specializing in the gums), oral surgeons, orthodontists (specializing in tooth movements and positions) and endodontists (specializing in the tooth pulp)(Ganapathy, 2016).Among the most popular options offered today for dental restoration is a dental implant(Ranganathan, Ganapathy and Jain, 2017)(Ashok and Suvitha, 2016)(Vijayalakshmi and Ganapathy, 2016). Considering all the factors, this present study aims to assess the patients requiring Full mouth Rehabilitation based on Turner and Missirlian classification.

MATERIAL AND METHODS

This Record-based, Retrospective study was conducted among patients reporting to the outpatient of Saveetha Dental College. patient records were analyzed with the data of 86000 patients between June 2019 and March 2020. Case sheets of all the patients with Prosthodontic diagnosis were reviewed for a period of the last 6 months. Out of total data,a sample of 65 patients who were indicated to undergo Full mouth rehabilitation was selected for the study, with the parameters such as age, gender, and Turner and Missirlian classification categories. Prior to the start of the study, ethical approval was obtained from the Scientific Review Board, Saveetha Dental College,SIMATS University. The age was grouped into (27-40 years),(40-50 years), and above 50 years. Gender includes males and females. Categories of Turner and Missirlian classification were category I, category II, category III. Data were recorded and tabulated in ms excel. Then the tabulated data expressed by means of frequency and percentage. Chi-square test was employed to find the association between gender and Categories of Turner and the Missirlian classification.P value less than 0.05 was considered to be statistically significant.

RESULT AND DISCUSSION

In this study, it was found that males were more in number as compared to females(Figure 1) as supportive studies done by (Song, Park and Park, 2010). many studies oppose this outcome (Jeyapalan, 2015; Suma, Suma and Koul, 2019).So, there is a disagree with this result, it may be because of geographical region, males in that particular area might have parafunctional habits such as night grinding, consumption of soft drinks, which leads to trauma form of occlusion and erosion respectively, results in tooth wear. Figure 2 shows the different categories of Turner and Missirlian classification, it was found

that category II was more in number(35) followed by category I(18). A supportive study done by (Madhankumar *et al.*, 2015) states that category II was more in number, another study done by (Briggs, Bishop and Kelleher, 1996) was opposed to this result. Figure 3 shows the various age group ranges (27-40 years),(40-50 years), and above 50 years among them, patients above 50 years age more in number. According to our study tooth wear is more prevalent over the age of 50 years. Many studies state that older age is strongly associated with tooth wear. The reason for higher prevalence includes insufficient nutrition, regurgitation(Junior, Batista and de Sousa, 2019b). Figure 4:Represent the correlation between gender and category in turner and missirlian classification. Graph shows that females with category II is frequently seen.The ratio of prevalence of Turner and Missilarian classification and their category between male and females were almost equal but males were found little more in number as compared to females A supportive study was done by (Abdel-Rahman, Tahir and Saleh, 2013) states that females in category II are more frequently affected as compared to males. Contrary to the present study, a study done by (Junior, Batista and de Sousa, 2019a) state that male with Turner and Missirlian are more in number as compared to females. Figure 5 Shows the correlation of age with categories of Turner and Missirlian we found that patients above 50 years with category II were more frequently seen and there is no significant relationship between gender and category of Turner and Missilarian classification(p value>0.05)(chi square test). A supportive study done by(Moaleem and Al Moaleem, 2016) states that old age people, more affected. Another study was done by (Junior, Batista and de Sousa, 2019b) states that non-carious loss of tooth tissue is an increasing problem to the dental profession, with young individuals, especially at risk.

The limitation of this study includes its small sample size and it is self-centered. There is lack of specific data available and mixed results obtained from the previous study. And also the information has been obtained retrospectively. Being said that, there is always a scope for more in the future. Extensive research with studies on a large population should be encouraged, more awareness on Turner and Missirlian classification and their categories should be created among general Dentists as well as students in institutions by conducting CDE programs.. It also helps the clinician to provide effective management and implementation to prevent complications and failure of the FMR treatment.

CONCLUSION

Within the limit of the present of study, it was found that males and females were almost equal in the number diagnosed to undergo FMR. The most affected age was above 50 years in Turner and Missilarian classification. In this study, we also found that females in category II were most frequently seen.

AUTHOR CONTRIBUTION-Author 1(Amit Kumar Singh) carried out the retrospective study by collecting data and drafted the manuscript after performing the necessary statistical analysis,aided in the conception of the topic.**Author 2(Dr. Revathi Duraiswamy)** has participated in the study design and has coordinated in developing the manuscript.All the authors have discussed the result among themselves and contributed in the final manuscript.

CONFLICT OF INTEREST-

None

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GRAPHS

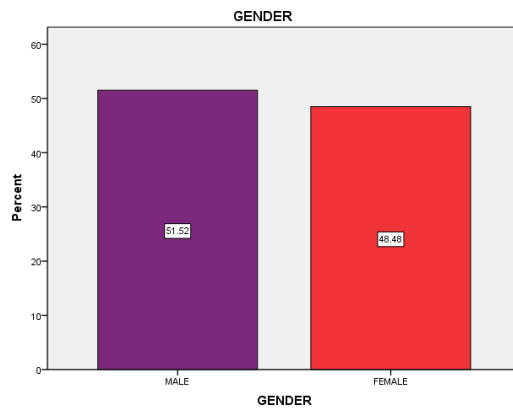


Figure 1: Bar graph showing the gender distribution of the study population, X axis represents the gender y axis represents the frequency of population where purple colour denotes the males and red colour denotes the females. 34 males (51.52%) and 32 females (48.48%) out of the total 66 patients who underwent FMR diagnosis

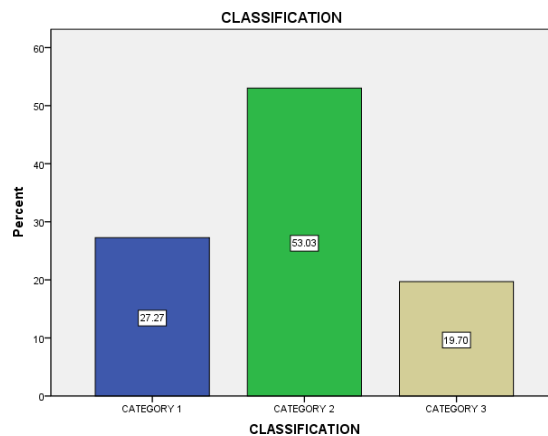


Figure 2: Bar graph showing the Frequency distribution of Turner and Missirlian classification. X axis represents the categories of Turner and Missirlian classification where blue colour denotes the category I, green colour denotes the category II and gray colour denotes the category III and on y axis denotes the number of patients diagnosed for FMR. From which we found that category II (53.03%) was most frequently seen as compared to category I (27.27%) and category III (19.70%).

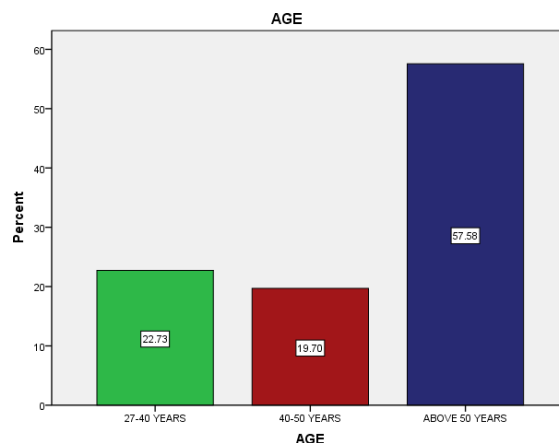


Figure 3: Shows the age distribution of the study population. X axis denotes the age range where green colour denotes the age range 27-40 years, red colour denotes the age range 40-50 years and blue colour

denotes the age range above 50 years. y axis denotes the number of patients diagnosed for FMR. Patients above 50 years(57.58%) were most frequently seen followed by the age group of 27-40 years(22.73%) and 40-50 years(19.70%).

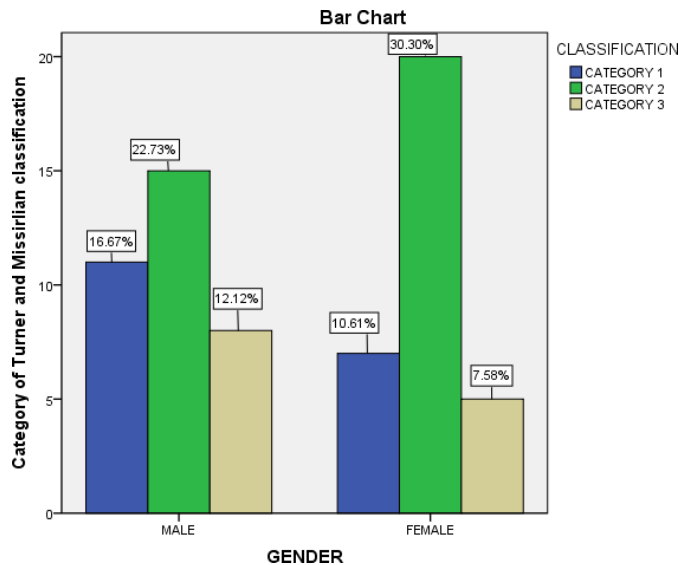


Figure 4: This bar graph represents the association between gender and Turner and Missirlian classification. X axis represents gender and Y axis represents categories in Turner and Missirlian classification. Blue colour denotes the category I (males- 16.67%) (females-10.61%), green colour denotes the category II (males-22.73%) (females-30.30%) and gray colour denotes the category III (males-12.12%) (females- 7.58%). Chi Square test was done, and the association between gender and categories in Turner and Missirlian classification was found to be statistically not significant since Pearson Chi-Square value-6.833 p value-.14 ($p > 0.05$) even though it is not significant females were found to have fallen under category II with the highest percentage of 30.30%, when compared to males with category II (22.73%)

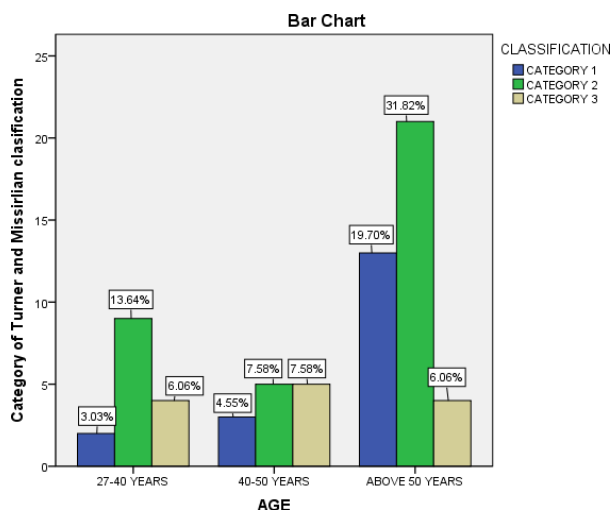


Figure 5: This bar graph represents the association between age and Turner and Missirlian classification. X axis represents Age groups 27-40years , 40-50 years and above 50 years. Y axis represents categories in Turner and Missirlian classification. Blue colour denotes the category I (27-40 years- 3.03%, 40-50 years-4.55%, above 50 years 19.70%), green colour denotes the category II (27-40 years- 13.64%, 40-50 years- 7.58%, above 50 years- 31.82%) and gray colour denotes the category III (27-40 years- 6.06%, 40-50 years- 7.58% and above 50 years- 6.06%). Chi Square test was done, and the association between age and categories in Turner and Missirlian classification was found to be statistically not significant since Pearson Chi-Square value-2.237 p value-0.3 ($p > 0.05$) even though it is not significant, patients above 50 years of

age group were found to have fallen under category II with the highest percentage of 31.82 %, followed by category I with the percentage of 19.70%.