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Prevalence And Severity Of Tooth Wear In Diabetic Patients - A Retrospective Analysis

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Abstract

The Aim Of This Study Is To Assess The Prevalence And Severity Of Tooth Wear In Diabetic Patients.Data Collection Was Done Using The Patient Database With The Timeframe Work Of 1st June 2019 To 30th April 2020 From An Institution.The Data Collected Comprised Of Group A Comprising Of 50 Diabetic Patients Of Which 25 Were Males And 25 Were Females And Group B Comprising Of 50 Non Diabetic Patients Of Which 25 Were Males And 25 Were Females.The Data Was Collected Retrospectively From The Patient Records. Degree Of Tooth Wear Was Calculated Based On Gaans Tooth Wear Index.The Data Was Tabulated In Excel Sheet.Chi Square Statistical Analysis And Mann Whitney U Test Was Done Using Spss Software. The Most Prevalent Age Group With Tooth Wear Is Between 46-55 Years In Both Diabetic And Non Diabetic Groups. And The Highest Degree Of Tooth Wear Seen Was Degree Ii In Diabetic And Degree I In Non Diabetic Patients. All Diabetic Patients In The Study Showed Tooth Wear. Mann Whitney Test For Independence Between Diabetic Status And Tooth Wear Was Performed .The Association Between Diabetic Status And Tooth Wear Showed A P Value Of 0.011 (<0.05) Which Is Statistically Significant.Within The Limits Of The Present Study, Diabetc Patients Showed Greater Tooth Wear Compared To Non Diabetic Patients. The Most Common Age Group With Tooth Wear In Diabetic Patients Is 46-55 Years. The

Most Prevalent Gender That Is Affected With Tooth Wear Is Males Compared To Females.The Highest Degree Of Tooth Wear Seen Is Degree Ii In Diabetics And Degree I In Non Diabetics. Diabetic Patients Presented Greater Tooth Wear When Compared To Non Diabetic Patients.

Keywords:Tooth Wear; Diabetes; Attrition; Sensitivity; Index.

1.Introduction:

Tooth Wear Is A Universal Consequence Of Aging [1]it Is A Complex Multifactorial Phenomenon With The Interplay Of Biological Mechanical Chemical And Tri Biological Factors [2]occlusal And The Incisal Surface Of The Teeth Expose To Tooth Wear More Frequently.Functional Teeth Are Important For Eating And Enable Older People To Consume Normal And Healthy Food. But Natural Tooth Retention Is Not Affected By Tooth Wear. Tooth Wear Has Recently Been Accepted As A Major Oral Health Problem[3,4]tooth Wear Presents As Attrition,Abrasion And Erosion.It Is The Loss Of Dental Hard Tissues That Resulting From The Chemical Or Mechanical Damage In The Absence Of Caries Or Trauma[5]

Attrition Is The Loss Of Tooth Substance Due To Tooth To Tooth Contact With No Foreign Substance Intervening And It Is Usually Due To Parafunctional Habits Such As Bruxism Or Grinding Of The Teeth[6] Abrasion On The Other Hand Is Defined As The Loss Of Tooth Substance By Mechanical Means Other Than The Tooth Contact.Erosion Is The Loss Of Dental Hard Tissue By The Chemical Action Without The Involvement Of The Bacteria [7] Tooth Wear Is The Loss Of Enamel And Dentin Which Causes Damage To The Oral Health With Resultant Tooth Sensitivity Which May Progress To Inflammation Of Pulpal,Periapical Periodontitis And Pulp Necrosis Thus Impacting On The Quality Of The Life And Well Being Of Affected Individuals[8] The Extensive Tooth Wear Found Among Primitive People Has Mainly Been Attributed To Abrasive Particles In The Diet [9] However Many Factors Have Been Found To Cause Incisal And Occlusal Breakdown,The Composition Of The Saliva,Muscular Forces And Parafunctional Habits.[10,11]many Studies Have Reported Tooth Wear To Be Higher Among Males Than Females[12]
Diabetes Is One Of The Most Common Non Communicable Disease Found In The Older People[13] The World Health Organisation Has Declared Diabetes To Be A Pandemic.Diabetes Mellitus Is Considered A Leading Cause Of Death Due To Its Microvascular And Macrovascular Complications[14] Tooth Wear In Diabetic Patients Can Be Due To Increased Intake Of Acids Inducing Foodstuffs And Poor Lifestyle Habits[15] Oral Manifestation In Diabetes Includes Fungal Infection,Bacterial Infection And Oral Lesion Such As Lichen Planus,Delayed Wound Healing,Neurosensory Oral Disorders,Dental Caries And Tooth Loss..Severity Of The Tooth Wear Was Also Reported To Be Associated With The Periodontal Health And Oral Hygiene Status[16] The Only Reliable Way To Measure Changes To The Teeth In Large Populations Are With The Help Of Tooth Wear Indices[17] Most Indices Use Changes To The Anatomical Appearance Of The Teeth To Record The Amount Of Wear.Some Indices Measure Tooth Wear On Every Surface Of Every Tooth,Some Use Selected Sites And Others Use Specific Surfaces. Gaans Index Is Considered Gold Standard In Scoring Attrition[5] Extremely Worn Dentition Is Uncommon But When It Occurs It Is Considered To Be A Great Esthetic And Clinical Concerns[18] It Is Therefore Important In The Clinical Practice To Identify An Accelerated Rate Of Tooth Wear At Early Stage Diagnosis Its Cause If Possible Apply Preventive Measure And Monitor Carefully Over A Long Period Of Time[19]

Various Studies Were Done In Our Department On Different Fields Like Determination Of Correlation Of Width Of Maxillary Anterior Teeth[20],Periodontal Health Status In Groups Wearing Temporary Partial Denture[21],Study On Implants [22,23],Studies On Microorganisms [24,25],Effect Of Resin Bonded Luting Cement[26],Cervical Incisal Marginal Discrepancy[27,28]the Other Studies Are Done On The Natural Products Like Aloe Vera[29] Various Studies Are Also Done On Awareness About All Ceramic Restoration In Rural Population[30],Review On Retraction Cords[31]. Oral Hygiene Status In Pregnant Women[32],Studies On Lip Bumper Prosthesis[33],Facial Prosthesis[34] Previously Our Team Has A Rich Experience In Working On Various Research Projects Across Multiple Disciplines The [35–3738–49].The Aim Of This Study Is To Assess The Prevalence And Severity Of Tooth Wear In Diabetic Patients Based On Gaans Tooth Wear Index.

2. Materials And Methods:

2.1 Study Setting:

The Study Was Conducted With The Approval Of The Institutional Ethics Committee **[**Sdc/Sihec/2020/Diasdata/0619-0320]. The Study Consisted Of One Reviewer, One Assessor And One Guide.

2.2 Study Design:
The Study Was Designed To Include Patients With Tooth Wear.The Patients Who Did Not Fall Under This Inclusion Criteria Were Excluded. All The Cases Were Reviewed Priorly And Included.

2.3 Data Collection And Tabulation:
Data Collection Was Done Using The Patient Database With The Timeframe Work Of 1st June 2019 To 30th April 2020.The Data Collected Comprised Of Group A Comprising Of 50 Diabetic Patients Of Which 25 Were Males And 25 Were Females And Group B Comprising Of 50 Non Diabetic Patients Of Which 25 Were Males And 25 Were Females.Group A And Group B Were Age And Sex Matched Groups.Gaans Tooth Index Was Used To Score The Tooth Wear Among Both Groups Cross Verification Of Data Was Done By A Reviewer.
Degree Of Tooth Wear Was Measured Using Ganns Tooth Wear Index:
Score 0-No Wear Into The Dentin.
Score 1-Dentin Just Visible.
Score 2-Dentin Exposure More Than One Third Of The Surface.
Score 3-Exposure Of Pulp Or Secondary Dentin.

2.4 Statistical Analysis:
The Variables Were Coded And The Data Was Imported To Spss. Using Spss Version 20.0 Categorical Variables Were Expressed In Terms Of Frequency And Percentage And Bar Graphs Were Plotted.The Statistical Significance Of The Associations Were Tested Using Mann Whitney U Test .

3.Results And Discussion:

A Total Of 50 Diabetic (Group A) And 50 Non Diabetic Patients (Group B) Were Included In This Study.In This Study It Is Shown That The Most Prevalent Age Group With Tooth Wear In Diabetic And Non Diabetic Patients Were 46-55 Years.The Highest Degree Of Tooth Wear Seen Is Degree Ii In Diabetic And Degree I In Non Diabetic Patients.The P Value Of Statistic Is 0.011 Which Is Statistically Significant(<0.05)(Mann Whitney Test) There Is An Association Between Diabetic Status And Tooth Wear. Group A(Diabetic) Presented Greater Tooth Wear Compared To Group B(Non Diabetic)

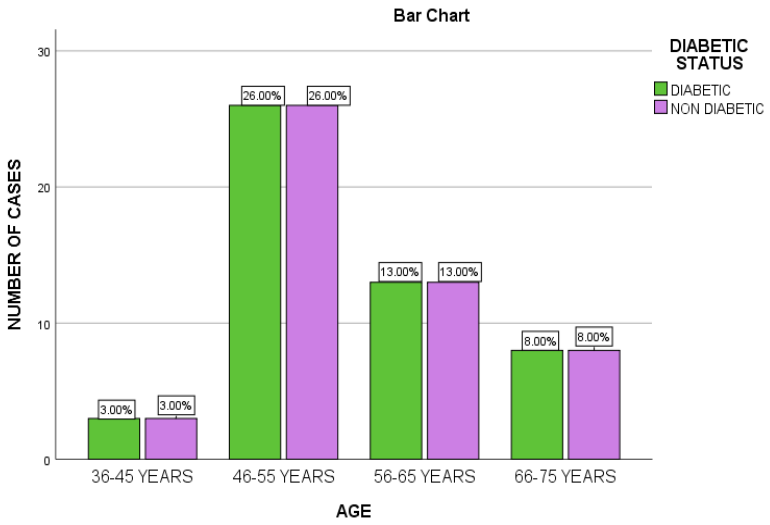

Figure 1:Bar Graph Depicts The Distribution Of Age Group Among The Diabetic And Non Diabetic Patients. It Is Inferred That The Patients Are Equally Distributed Across The Age Groups Between Diabetic And Non Diabetic Patients.

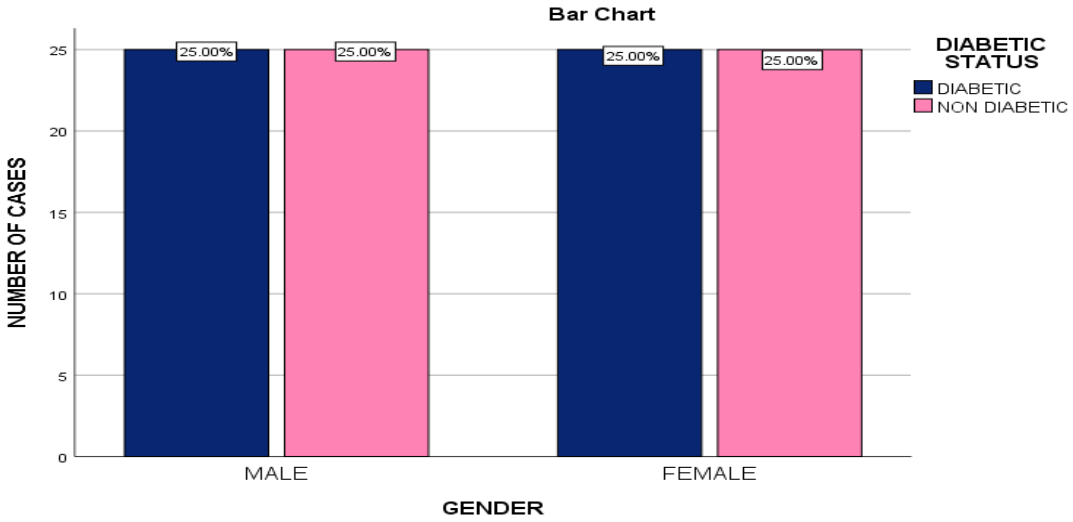

Figure 2:Bar Graph Depicts The Distribution Of Gender Among The Diabetic And Non Diabetic Patients.It Is Inferred That The Patients Are Equally Distributed Across The Gender Between Diabetic And Non Diabetic Patients.

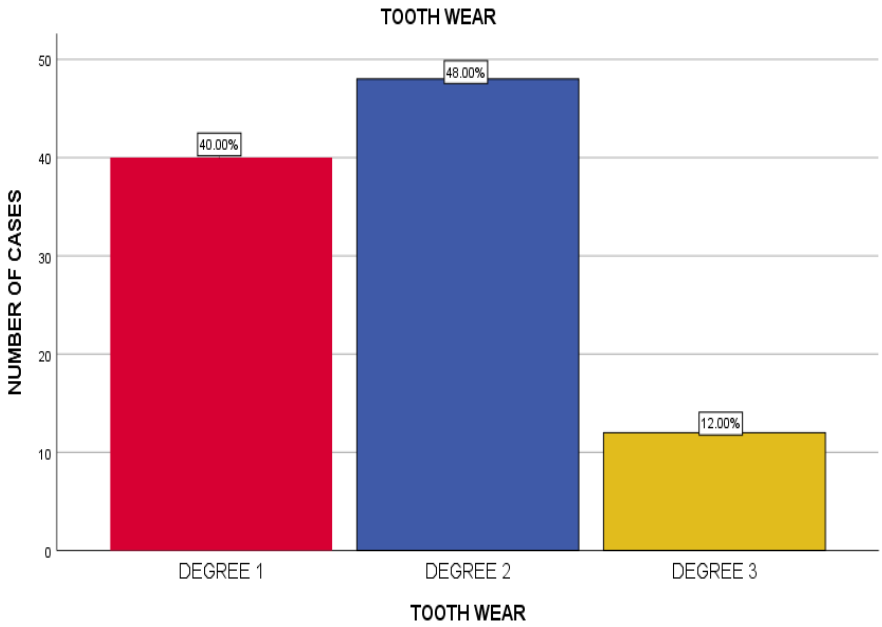

Figure 3: Bar Graph Depicting The Distribution Of Degree Of Tooth Wear Among Diabetic Patients. X Axis Represents The Degree Of Tooth Wear In Diabetic Patients And Y Axis Represents The Number Diabetic Patients. Most Prevalent Degree Of Tooth Wear In Diabetic Patients Seen Is Degree Ii With 48%(Blue)

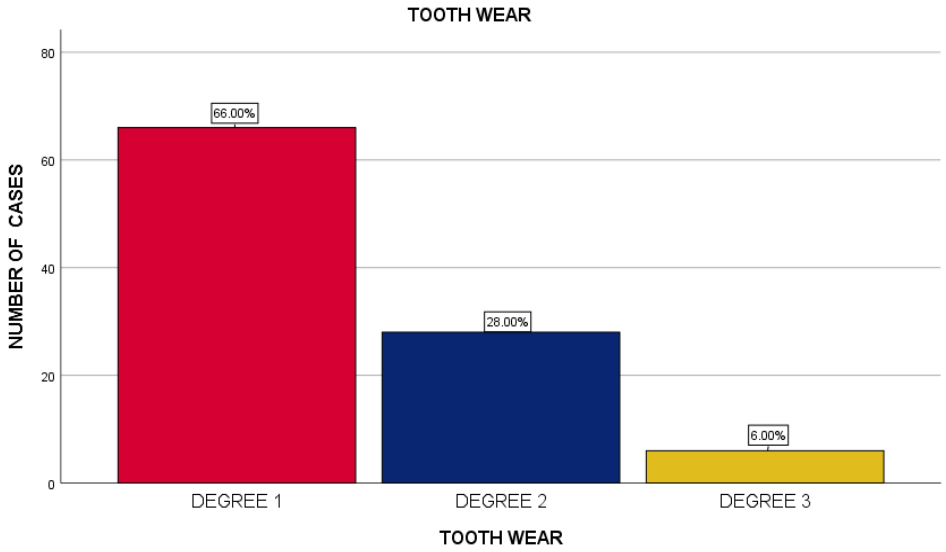

Figure 4: Bar Graph Depicting The Distribution Of Degree Of Tooth Wear In Non Diabetic Patients Among The Study Population.X Axis Represents The Degree Of Tooth Wear Among Non Diabetic Patients And Y Axis Represents The Number Of The Patients. Most Prevalent Degree Of Tooth Wear In Diabetic Patients Seen Is Degree 1 With 66%(Red).

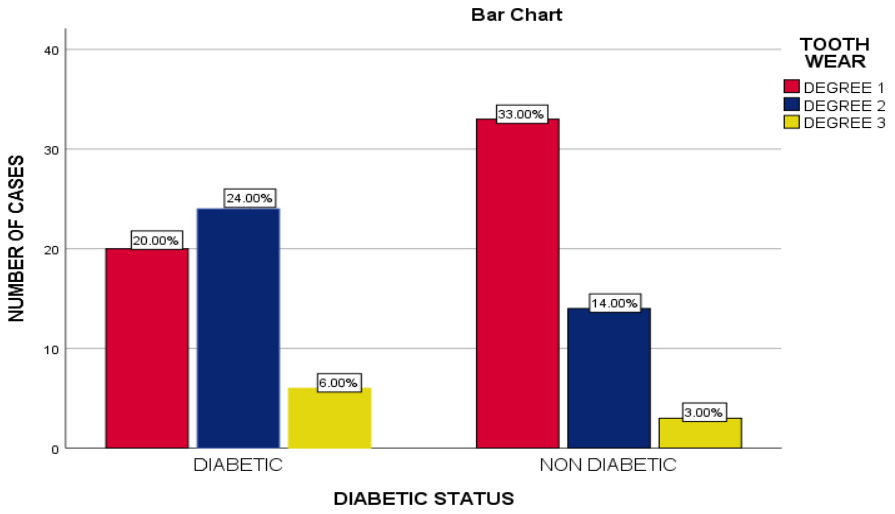

Figure 5: Bar Graph Depicting The Association Between The Diabetic Status And Degree Of Tooth Wear.X Axis Represents The Diabetic Status And Y Axis Represents The Number Of Patients.The P Value Of Statistic Is 0.011 Which Is Statistically Significant(<0.05)(Mann Whitney Test) There Is An Association Between Diabetic Status And Tooth Wear. Group A - Diabetic Patients Presented With Degree 2 Tooth Wear. Group B - Non Diabetic Patients Presented More Commonly With Degree 1 Tooth Wear.

(Figure 1) Shows The Distribution Of Age Group Among The Diabetic And Non Diabetic Patients.It Is Inferred That The Patients Are Equally Distributed Across The Age Groups Between Diabetic And Non Diabetic Patients.(Figure 2) Shows The Distribution Of Gender Among The Diabetic And Non Diabetic Patients.It Is Inferred That The Patients Are Equally Distributed Across The Gender Between Diabetic And Non Diabetic Patients.Previous Studies Showed

A Increased Prevalence Of Tooth Wear In Males[50] This Can Be Due To Increased Bite Forces In Males Than Females[51].

Tooth Wear Is Loss Of Dental Hard Tissue In The Absence Of Caries Or Trauma Which Can Present With Pain And Can Be Associated With Problem While Chewing,Speech And Facial Appearance.This Will Ultimately Have A Major Impact On The Individuals Quality Of Life And By The Extension Of Their Social Wellbeing. Degree Of Tooth Wear Was Measured According To Ganns Tooth Wear Index And It Included Degree 1,2,3.Shows The Degree Of Tooth Wear In Diabetic Patients. (Figure 3) Shows The Distribution Of Degree Of Tooth Wear Among Diabetic Patients.Most Prevalent Degree Of Tooth Wear In Diabetic Patients Seen Is Degree Ii With 48%.(Figure 4) Shows The Distribution Of Degree Of Tooth Wear In Non Diabetic Patients Among The Study Population.Most Prevalent Degree Of Tooth Wear In Diabetic Patients Seen Is Degree 1 With 66%.

(Figure 5) Shows The Association Between The Diabetic Status And The Degree Of Tooth Wear. The P Value $0.011<0.05$,(Mann Whitney Test) Statistically Significant.There Is An Association Between Diabetic Status And Tooth Wear. Group A(Diabetic) Presented Greater Tooth Wear Compared To Group B(Non Diabetic)

The Most Common Complaint Caused Due To Tooth Wear Is Hypersensitivity And Associated With Poor Appearance ,Despite The Presence Of Advanced Tooth Wear Patients Do Not Complain Of Pain Due To Secondary Dentin Deposition.Severe Loss Of Tooth Cause The Loss Of Vertical Dimension And Can Cause Temporomandibular Disorders[52] The Reason Behind Increased Intensity Of Tooth Wear In Diabetic Patient Is Unknown.Our Institution Is Passionate About High Quality Evidence Based Research And Has Excelled In Various Fields ([53–63]the Current Study Proved Males Have High Tooth Wear When Compared To Females And There Is A Hike In Tooth Wear In Diabetic Patients Than In Nondiabetic Patients.

4. Conclusion:

Within The Limits Of The Present Study, Diabetc Patients Showed Greater Tooth Wear Compared To Non Diabetic Patients. The Most Common Age Group With Tooth Wear In Diabetic Patients Is 46-55 Years. The Most Prevalent Gender That Is Affected With Tooth Wear Is Males Compared To Females.The Highest Degree Of Tooth Wear Seen Is Degree Ii In Diabetics And Degree I In Non Diabetics..Diabetic Patients Presented Greater Tooth Wear When Compared To Non Diabetic Patients.Further Studies To Be Performed To Evaluate Diabetes As Risk Factor For Tooth Wear.

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6. Authors Contribution

G.Nithya Karpagam , Dr Visalakshi Ramanathan Contributed To The Concept, Design, Literature Analysis, Workshop Discussions, And Drafting And Revising Manuscript.
Dr Visalakshi Ramanathan And Dr Dinesh Prabu Contributed To Drafting And Revising Manuscripts. All Authors Gave Final Approval Of The Version To Be Published.

7. Conflicts Of Interest

There Were No Conflicts Of Interest.

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