# Dental Communication



Biosc.Biotech.Res.Comm. Special Issue Vol 13 No 8 2020 Pp-266-271

# Assessment of Age and Gender Distribution of Patients Having Cervical Abrasion and the Treatment of Choice for Abraded Teeth

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ABSTRACT

As the age of people increases, they are subject to non-carious lesions, which are current issue of concern for dentists regarding the diagnosis and planning treatment for the same. Noncarious cervical lesions have become an important factor, when long term health of dentition is concerned. They can lead to tooth sensitivity, plaque retention, high incidence of caries. Management of cervical abrasions include counselling regarding proper brushing technique and dental treatments such as composite restorations. The main aim of this study is to determine the gender and age group which is highly affected by cervical abrasions and to determine the most opted treatment of choice for cervical abrasions. About 1800 case sheets diagnosed with cervical abrasions, between June 2019 and March-2020 were retrieved from the electronic database . Collected data were entered into the Excel sheet and was analysed using SPSS analysis. Results showed that cervical abrasions were more prevalent among age group 41-50 years (30.83%) and among males (69.54%). Direct composite restorations were more commonly done for treatment of cervical abrasions (84.38%). In conclusion, cervical abrasions were more common among the age group 41-50 years and direct composite restoration was more commonly done for treatment of cervical abrasions (84.38%).

KEY WORDS: ABRASION, GIC, CERVICAL, TOOTH WEAR, COMPOSITE, NON CARIOUS .

### **INTRODUCTION**

Tooth surface loss is an irreversible, multifactorial, non carious, physiologic, pathologic, or functional loss of

#### ARTICLE INFORMATION

\*Corresponding Author: subash@saveetha.com Received 27th July 2020 Accepted after revision 21th Sep 2020 Print ISSN: 0974-6455 Online ISSN: 2321-4007 CODEN: BBRCBA

Thomson Reuters ISI Web of Science Clarivate Analytics USA and Crossref Indexed Journal

Clarivate Analytics



NAAS Journal Score 2020 (4.31) SJIF: 2020 (7.728) A Society of Science and Nature Publication, Bhopal India 2020. All rights reserved. Online Contents Available at: http://www.bbrc.in/ Doi: http://dx.doi.org/10.21786/bbrc/13.8/149 dental hard tissues and has been a topic of concern among dental professionals. It is a multifactorial process involving destruction of enamel and dentin which can lead to harmful changes to teeth and affects the quality of life among people (M. K. Al-Omiri, P. J. Lamey, and T. Clifford, 2006),(Al-Zarea, 2012). There are three main, or widely recognized, aetiologies of tooth wear, namely, erosion, attrition, abrasion and abfraction (Lee and Stephan Eakle, 1984),(Bartlett, 2005), among which, abrasion is the most common etiological factor for development of tooth wear. Abrasion is described as mechanical wear of hard tissues of dentition without involving tooth-to-tooth contact and it is commonly presented in the cervical region of teeth. Cervical abrasion



is more often associated with improper brushing habits, combined with nature of toothbrush used, such as frequent or forceful tooth brushing, faulty or vigorous techniques, filament stiffness or design, dominant hand dexterity, or abrasive dentifrices, which result in wear of enamel and dentin in cervical region of the teeth (Bartlett and Shah, 2006). Other causes of cervical abrasions include abnormal habits such as rubbing of foreign material over the cervical region,exposure to workplaces that involves working with sand (Litonjua et al., 2003),(Turner and Missirlian, 1984).

Treatment of cervical abrasions involves the following steps: identification of etiology, diagnosis, removal of that etiological factor and, if necessary, restoration. Abrasion can also occur as a result of overzealous tooth brushing, improper use of dental floss and toothpicks, or detrimental oral habits. On clinical examination, cervical abrasions are presented as cavities with polished surfaces, not necessarily accompanied by pain in the region. In case of abrasion caused by improper brushing techniques, the enamel wear is more different than the dentin which erodes, following the path made by the toothbrush (Grippo, Simring and Schreiner, 2004). Many methods for management of cervical abrasions are present which include providing counselling regarding proper brushing technique, use of appropriate dentifrice and correction of any abnormal habit related to the cause of cervical abrasion to patients and restoration.

Figure 1: Graph represents distribution of age with the number of patients in percentage. The X axis represents the age groups and Y axis represents the number of patients in percentage , purple colour represents 0–20 years, navy blue colour represents 21–30 years, dark blue represents 31–40 years,green colour represents 41–50 years, red colour represents 51–60 years and black colour represents > 60 years. Graph inferred that cervical abrasions were more prevalent among the age group between 41–50 years (30.83%)



Restorative treatment options, which are minimally invasive and aesthetically pleasing, are accepted as the treatment of choice. Restorative treatment is considered, if the structural integrity of teeth is compromised, the exposed dentin is hypersensitive and if the defect is esthetically unacceptable to the patient (Lussi et al., 2009). Many studies have shown that better restorative materials with improved properties are preferred over restorative materials such as amalgam in the modern day restoration of abrasions. Glass ionomer cements , resinmodified GICs, GIC/RMGIC liner base laminated with a resin composite, and resin composites in combination with a dentin bonding agent, are all restorative options which are considered for management of cervical abrasions (Kuroe et al., 2001),(Meraner, 2006),(Ichim et al., 2007) .

We have numerous highly cited publications on well designed clinical trials and lab studies (Govindaraju, Neelakantan and Gutmann, 2017; Azeem and Sureshbabu, 2018; Jenarthanan and Subbarao, 2018; Manohar and Sharma, 2018; Nandakumar and Nasim, 2018; Teja, Ramesh and Priya, 2018; Janani and Sandhya, 2019; Khandelwal and Palanivelu, 2019; Malli Sureshbabu et al., 2019; Poorni, Srinivasan and Nivedhitha, 2019; Rajakeerthi and Ms, 2019; Rajendran et al., 2019; Ramarao and Sathyanarayanan, 2019; Siddique and Nivedhitha, 2019; Siddique et al., 2019; Siddique, Nivedhitha and Jacob, 2019). This has provided the right platforms for us to pursue the current study. Our main aim is to determine which gender and age group is highly affected by cervical abrasions and the treatment of choice for the management of cervical abrasions.

Figure 2: Graph represents the distribution of gender with the number of patients in percentage. The X axis represents the gender and Y axis represents the number of patients in percentage.On analysis it can be seen that pink colour represents females and blue colour represents males.From this bar graph, it can be inferred that cervical abrasions were more prevalent among the males (69.54%) than females (30.41%).



### **MATERIAL AND METHODS**

The study was set in University setting and Institutional Ethics Committee approval was obtained (ethical approval number SDC/SIHEC/2020/DIASDATA/0619-0320). 86000 patient case records were obtained and out of which 1800 case sheets of patients who underwent treatment for cervical abrasions between June 2019-March 2020 were retrieved from Saveetha Dental college. The

collected data regarding treatment was into 2 groups: Bi-layered restorations (GIC base and composite) and Direct composite restorations. The data was analysed by 2 reviewers - the primary researcher and department faculty.

The inclusion criteria were patients who were given Bilayered restorations and direct composite restorations and exclusion criteria were restorations done due to presence of carious lesion. The variables recorded were age, gender and treatment or material of choice for cervical abrasion. Data collection was done by entering data into Microsoft Excel and then transferred into statistical package for Social Sciences (SPSS) software. The independent variables present in the study were age and sex. The dependent variables were treatment for cervical abrasions. The type of analysis used for this study was correlation and association. The internal validity of the study was established as the data was collected from a verifiable and standardised database. The external validity is established as the data is from a clinical setup which is duplicatable.

Figure 3: Graph represents the distribution of treatment of choice for cervical abrasions with the number of teeth treated in percentage. The X axis represents the treatment of choice and Y axis represents the number of teeth in percentage , whereas blue colour represents the bilayered restorations (Gic base + Composite restoration) and green colour represents direct composite restorations. Graph infers that direct composite restorations were more commonly preferred treatment for cervical abrasions (84.38%) than bilayered restorations.



#### **RESULTS AND DISCUSSION**

The data obtained were plotted in the form of bar charts and was analysed. In this study, it was observed that cervical abrasions were more prevalent among the age group 41-50 years (30.84%) among the study population and males were more commonly affected by cervical abrasions (69.54%). Direct composite restorations were more commonly done for management of cervical abrasions ( 84.38 %) and was more commonly done among males (59.26%) and patients of age group 41-50 years (26.44%). Fig.I shows distribution of age among study population and cervical abrasions were more prevalent among age group 41-50 years (30.89%). Fig.II shows that cervical abrasions were more prevalent among males (69.54%) and Fig.III shows that direct composite restorations were more commonly done for management of cervical abrasions (84.38%). Fig.IV shows that direct composite restorations were more commonly done among age group 41-50 years (26.44%) and Fig.V shows that males underwent more direct composite restorations than females for cervical abrasions (59.26%).

Figure 4: Graph represents the association between age and treatment of choice for cervical abrasions. X axis represents the age and Y axis represents the number of cases .Blue colour represents the bilayered restorations and green colour represents direct composite restorations. Graph Infers that among all age groups, direct composite restorations were more commonly done. Chi-square test was done and association was found to be not statistically significant. Pearson's Chi-square value : 6.985, p value : 0.22 (>0.05).



Figure 5: Graph represents association between gender and treatment of choice for cervical abrasions. The X axis represents the gender and Y axis represents the number of cases. Blue colour represents bilayered restorations and green colour represents composite restorations. Graph infers that direct composite restorations were more commonly done among males (59.26%). Chi-square test was done and association was found to be not statistically significant. (Pearson's Chi-square value : 1.319, p value : 0.25 (>0.05)



Cervical abrasions can be caused due to excessive toothbrush force, dentifrice abrasion, abfraction, erosive tooth wear or a combination of these factors. Although it's not necessary to provide restorations for cervical abrasions, patients often seek treatment to help improve esthetics. The method of restoration and the material selected for restoration of cervical abrasions depends on etiology and the nature of the cervical abrasion. Materials with a low elastic modulus that will accommodate tooth flexure, such as microfilled, nanohybrid or nanofilled composite resin, GIC or RMGIC, are often chosen for restoration of cervical abrasion (Ahmed SN, 2017). In this study, it was observed that cervical abrasions were more prevalent among age group 41-50 years (30.83%). This finding was found to be similar to the findings of study by Ahmad.H et al.,(Ahmad H, 2009) and Ketterl W et. al., (Ketterl, 1983), where cervical abrasions were found to be more common among the older population between 41-80.

Table 1. Chi square test table showing p values for association between age and treatment of choice for cervical abrasion and association between gender and treatment of choice for cervical abrasions.From this table, it can be inferred that association between age and treatment of choice for cervical abrasions and association between gender and treatment of choice for cervical abrasions were found to be not significant.

Parameter	p value	Significance	Inference
Age vs Treatment for cervical abrasion	0.22	> 0.05	Not significant
Gender vs Treatment for cervical abrasion	0.25	> 0.05	Not significant

This can be attributed to the fact that older populations are more susceptible to developing gingival recession and bone loss, with more root surface and cementum exposure, increasing the risk of cervical lesions. This was contradictory to the findings by Mujeeb F et al., (Mujeeb F, Soomro ZA, Rashid S, Hosein T., 2015) where it was seen that among patients upto 60 years and above there was a decrease in incidence of cervical abrasions. This can be attributed to the fact that most patients above 55 years have their teeth extracted rather than treated in Pakistan, and hence the incidence of cervical abrasions among the older population was low. Males were found to be more commonly affected by cervical abrasions (69.58%), which was found to be in agreement with findings of studies by Ahmad.H et al., (Ahmad H, 2009) and Cunha-Cruz et al., (Cunha-Cruz et al., 2010) where males were found to be affected by cervical abrasions more than females.

In this study, it was observed that direct composite restorations were found to be the most commonly provided treatment for cervical abrasions (84.38%). Many studies have shown that resin composite restoration was an excellent choice for management of cervical abrasions (Vandewalle KS, 1997), (Peumans et al., 2007). Properties of resin composite such as having acceptable esthetic outcome, its minimally invasive nature and its biocompatibility makes it an excellent choice for restoration of cervical abrasions(Mehta et al., 2012),(Mehta, Francis and Banerji, 2016) .This was found to be in contradiction to studies by Adeleke et al., (Adeleke and Oginni, 2012), Franco E.B et al., (Franco et al., 2006) and Tyas M J et al., (Tyas, 1995), where bi layered restorations (GIC base) were recommended for management of cervical abrasions. This can be attributed to the fact that GIC cement exhibits properties such as: biocompatibility, adhesion to calcified substrates (especially in cases of dentin sclerosis where traditional adhesion may underperform), elastic modulus similar to the dentin, good marginal adaptability and good retention qualities, and was considered to be superior to that of composite restorations.(Nasim et al., 2018).

# CONCLUSION

Within the limitations of this study, it shows cervical abrasions were more prevalent among the age group of 41-50 years (30.83%) and Males were found to be more commonly affected by cervical abrasions (69.58%). It also showed that direct composite restorations such as microfilled or nanofilled composites was the treatment of choice for cervical abrasions followed by bilayered restoration for deeper cavities.

# ACKNOWLEDGEMENTS

We the authors of the manuscript, would like to thank and acknowledge Saveetha Dental College for providing us access to use the retrospective data for the study.

**Author Contributions:** The authors have contributed to study design ,data collection, analysis of data,tabulation of results, manuscript typing and formatting. and critical reviewing.

**Conflict of Interest:** This research project is self funded and is not sponsored or aided by any third party.There is no conflict of interest.

### REFERENCES

- Adeleke and Oginni, A. (2012) 'Clinical evaluation of resin composite and resin-modified glass ionomer cement in non-carious cervical lesions', Journal of the West African College of Surgeons, 2(4), pp. 21–37.
- Ahmad H, R. M. (2009) 'Study on Non-Carious cervical lesions', Journal of The College of Physicians and Surgeons Pakistan., 19(5), p. 279.
- Ahmed SN, B. S. C. (2017) 'Treatment Strategies for Noncarious Cervical Lesions', THE JOURNAL OF MULTIDISCIPLINARY CARE DECISIONS IN DENTISTRY, 3(4), pp. 24–28.
- Al-Zarea, B. K. (2012) 'Tooth surface loss and associated risk factors in northern saudi arabia', ISRN dentistry,

#### 2012, p. 161565.

Azeem, R. A. and Sureshbabu, N. M. (2018) 'Clinical performance of direct versus indirect composite restorations in posterior teeth: A systematic review', Journal of conservative dentistry: JCD, 21(1), pp. 2–9. Bartlett, D. W. (2005) 'The role of erosion in tooth wear: aetiology, prevention and management', International Dental Journal, pp. 277–284. doi: 10.1111/j.1875-595x.2005.tb00065.x.

Bartlett, D. W. and Shah, P. (2006) 'A Critical Review of Non-carious Cervical (Wear) Lesions and the Role of Abfraction, Erosion, and Abrasion', Journal of Dental Research, pp. 306–312. doi: 10.1177/154405910608500405.

Cunha-Cruz, J. et al. (2010) 'Tooth wear: prevalence and associated factors in general practice patients', Community Dentistry and Oral Epidemiology, pp. 228–234. doi: 10.1111/j.1600-0528.2010.00537.x.

Franco, E. B. et al. (2006) '5-year clinical performance of resin composite versus resin modified glass ionomer restorative system in non-carious cervical lesions', Operative dentistry, 31(4), pp. 403–408.

Govindaraju, L., Neelakantan, P. and Gutmann, J. L. (2017) 'Effect of root canal irrigating solutions on the compressive strength of tricalcium silicate cements', Clinical oral investigations, 21(2), pp. 567–571.

Grippo, J. O., Simring, M. and Schreiner, S. (2004) 'Attrition, abrasion, corrosion and abfraction revisited', The Journal of the American Dental Association, pp. 1109–1118. doi: 10.14219/jada.archive.2004.0369.

Ichim, I. et al. (2007) 'Restoration of non-carious cervical lesionsPart I. Modelling of restorative fracture', Dental Materials, pp. 1553–1561. doi: 10.1016/j. dental.2007.02.003.

Janani, K. and Sandhya, R. (2019) 'A survey on skills for cone beam computed tomography interpretation among endodontists for endodontic treatment procedure', Indian journal of dental research: official publication of Indian Society for Dental Research, 30(6), pp. 834–838.

Jenarthanan, S. and Subbarao, C. (2018) 'Comparative evaluation of the efficacy of diclofenac sodium administered using different delivery routes in the management of endodontic pain: A randomized controlled clinical trial', Journal of conservative dentistry: JCD, 21(3), pp. 297–301.

Ketterl, W. (1983) 'Age-induced changes in the teeth and their attachment apparatus', International dental journal, 33(3), pp. 262–271.

Khandelwal, A. and Palanivelu, A. (2019) 'Correlation Between Dental Caries And Salivary Albumin In Adult Population In Chennai: An In Vivo Study', Brazilian Dental Science, 22(2), pp. 228–233. Kuroe, T. et al. (2001) 'Biomechanics of development and restoration of noncarious cervical lesions', The Proceedings of the Bioengineering Conference Annual Meeting of BED/JSME, pp. 114–115. doi: 10.1299/ jsmebio.2001.13.114.

Lee, W. C. and Stephan Eakle, W. (1984) 'Possible role of tensile stress in the etiology of cervical erosive lesions of teeth', The Journal of Prosthetic Dentistry, pp. 374–380. doi: 10.1016/0022-3913(84)90448-7.

Litonjua, L. A. et al. (2003) 'Noncarious cervical lesions and abfractions', The Journal of the American Dental Association, pp. 845–850. doi: 10.14219/jada. archive.2003.0282.

Lussi, A. et al. (2009) 'Dental Erosion', Operative Dentistry, pp. 251–262. doi: 10.2341/09-bl.

Malli Sureshbabu, N. et al. (2019) 'Concentrated Growth Factors as an Ingenious Biomaterial in Regeneration of Bony Defects after Periapical Surgery: A Report of Two Cases', Case reports in dentistry, 2019, p. 7046203.

Manohar, M. P. and Sharma, S. (2018) 'A survey of the knowledge, attitude, and awareness about the principal choice of intracanal medicaments among the general dental practitioners and nonendodontic specialists', Indian journal of dental research: official publication of Indian Society for Dental Research, 29(6), pp. 716–720.

Mehta, S. B. et al. (2012) 'Current concepts on the management of tooth wear: part 2. Active restorative care 1: the management of localised tooth wear', British dental journal, 212(2), pp. 73–82.

Mehta, S. B., Francis, S. and Banerji, S. (2016) 'A guided, conservative approach for the management of localized mandibular anterior tooth wear', Dental Update, pp. 106–112. doi: 10.12968/denu.2016.43.2.106.

Meraner, M. (2006) 'Soft tissue management for difficult cervical restorations', General dentistry, 54(2), pp. 117–120.

M. K. Al-Omiri, P. J. Lamey, and T. Clifford (2006) 'Impact of tooth wear on daily living', The International journal of prosthodontics, 19(6), pp. 601–605.

Mujeeb F, Soomro ZA, Rashid S, Hosein T. (2015) 'Risk Factors Associated With Non Carious Cervical Lesions At A Teaching Hospital', J Pak Dent Assoc., 24(4), pp. 188–193.

Nandakumar, M. and Nasim, I. (2018) 'Comparative evaluation of grape seed and cranberry extracts in preventing enamel erosion: An optical emission spectrometric analysis', Journal of conservative dentistry: JCD, 21(5), pp. 516–520.

Nasim, I. et al. (2018) 'Clinical performance of resinmodified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions: One-year follow-up', Journal of

#### Prathoshni et al.,

Conservative Dentistry, p. 510. doi: 10.4103/jcd. jcd\_51\_18.

Peumans, M. et al. (2007) 'Restoring cervical lesions with flexible composites', Dental materials: official publication of the Academy of Dental Materials, 23(6), pp. 749–754.

Poorni, S., Srinivasan, M. R. and Nivedhitha, M. S. (2019) 'Probiotic strains in caries prevention: A systematic review', Journal of conservative dentistry: JCD, 22(2), pp. 123–128.

Rajakeerthi, R. and Ms, N. (2019) 'Natural Product as the Storage medium for an avulsed tooth – A Systematic Review', Cumhuriyet Dental Journal, 22(2), pp. 249– 256.

Rajendran, R. et al. (2019) 'Comparative Evaluation of Remineralizing Potential of a Paste Containing Bioactive Glass and a Topical Cream Containing Casein Phosphopeptide-Amorphous Calcium Phosphate: An in Vitro Study', Pesquisa brasileira em odontopediatria e clinica integrada, 19(1), pp. 1–10.

Ramarao, S. and Sathyanarayanan, U. (2019) 'CRA Grid - A preliminary development and calibration of a paper-based objectivization of caries risk assessment in undergraduate dental education', Journal of conservative dentistry: JCD, 22(2), pp. 185–190.

Siddique, R. et al. (2019) 'Qualitative and quantitative analysis of precipitate formation following interaction

of chlorhexidine with sodium hypochlorite, neem, and tulsi', Journal of conservative dentistry: JCD, 22(1), pp. 40–47.

Siddique, R. and Nivedhitha, M. S. (2019) 'Effectiveness of rotary and reciprocating systems on microbial reduction: A systematic review', Journal of conservative dentistry: JCD, 22(2), pp. 114–122.

Siddique, R., Nivedhitha, M. S. and Jacob, B. (2019) 'Quantitative analysis for detection of toxic elements in various irrigants, their combination (precipitate), and para-chloroaniline: An inductively coupled plasma mass spectrometry study', Journal of conservative dentistry: JCD, 22(4), pp. 344–350.

Teja, K. V., Ramesh, S. and Priya, V. (2018) 'Regulation of matrix metalloproteinase-3 gene expression in inflammation: A molecular study', Journal of conservative dentistry: JCD, 21(6), pp. 592–596.

Turner, K. A. and Missirlian, D. M. (1984) 'Restoration of the extremely worn dentition', The Journal of Prosthetic Dentistry, pp. 467–474. doi: 10.1016/0022-3913(84)90326-3.

Tyas, M. J. (1995) 'The Class V lesion - Aetiology and restoration', Australian Dental Journal, pp. 167–170. doi: 10.1111/j.1834-7819.1995.tb05631.x.

Vandewalle KS, V. G. (1997) 'Guidelines for the restoration of Class V lesions', General dentistry, 45, pp. 254–260.