

# Evaluation the Correlation between Age, Gender, and the Incidence of Cervical Lesions

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## ABSTRACT

**Objective:** The purpose of this study was to assess the number of cases of the cervical lesion in relation to age and gender among patient in Universiti Sains Islam Malaysia (USIM) dental clinic. A secondary purpose was to identify the type of dental restorative materials used according to the type of teeth and type of cervical lesions and to identify the most common dental material that has been used in USIM dental clinic. **Materials and Methods:** This is retrospective study where 1447 patients' folders from USIM dental clinic were collected to identify teeth that had cervical restorations. From the number, 123 folders were identified with cervical restorations. From the data, 263 teeth were noted with cervical restorations. Data were entered and analyzed using the Statistical Package for the Social Sciences version 16.0. **Result:** It is found that age is strongly associated with cervical lesion ( $P < 0.001$ ) while gender and type of tooth have no significant difference. It is also found that the type of material used has no association with the type of lesions. The most type of material used in USIM's dental clinic is glass ionomer cement (GIC) which has been used 10.2% for carious cervical lesion (CCL) and 44.7% for non-CCL. Total percentage of GIC is 54.9% as compared with the other restorative materials. **Conclusion:** It is concluded that the age factor has a strong influence toward the cervical lesion.

**Key words:** Age, Gender, cervical lesions

## INTRODUCTION

Cervical lesions can be defined as lesions that involve the gingival one-third of the facial and lingual surface of the tooth crown.<sup>[1]</sup> It is found that the cervical lesions can be divided into two types which are carious cervical lesions (CCL) and non-CCL (NCCLs).<sup>[2]</sup>

The first type of cervical lesion is a CCL or also can be known as cervical caries or root caries. The term cervical caries and root caries are often used interchangeably. The term cervical caries may be more accurate because carious lesions involve at cervical area. However the term root caries also have been used to describe lesions that exist on the root surface, although these may include the proximal surfaces as well.<sup>[1]</sup>

Another issue concerning carious lesion is the term primary and secondary caries. The term primary caries as it is used with root caries refers to new dental caries occurring in the absence of a restoration. Secondary or recurrent root caries refers to caries occurring adjacent to an existing restoration.

Root caries most often occur at supragingival areas or at close to (within 2 mm) the cements/enamel junction. This phenomenon is due to the location of the gingival margin at the time conditions were favorable for caries to occur. Apparently, the location of this caries has been positively associated with age and gingival recession. It is also found that root caries occurs in a location adjacent to the crest of the gingiva where dental plaque accumulates. They occur predominantly on the proximal (mesial and distal) surfaces, followed by the facial surface.<sup>[3]</sup>

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In term of prevalence, root caries is a persistent problem that shows an increment of severity of root caries along with the increase of age. It has a high percentage in elderly patient. There are studies reported about 287 independently living elderly people over the age of 60 years were examined for the prevalence of active, inactive, and filled root lesions as well as the number of teeth. About 39% of the subjects had one or more decayed roots, and 53.3% had at least one decayed or filled lesion. Root caries was seen most frequently on canine teeth followed by the first premolar.<sup>[4]</sup>

In Malaysia, there has been data on the percentage of teeth affected by root caries reported by National Oral Health Survey of Adults in Malaysia 2000. The highest percentage is the age group of 70–74 (24.2%), followed by age group over 75 (4.3%) and age group 50–54 years (1.6%).<sup>[5,6]</sup>

The second type of cervical lesion is NCCLs. It is refer to the pathological loss of tooth tissue by a disease process other than dental caries.<sup>[7]</sup> The broad range suggests variations in the definition of NCCLs or difficulties in detecting them.<sup>[8]</sup> It is generally agreed that the lesions are formed due to a combination of abrasion, erosion, and tooth flexure.<sup>[9]</sup>

Tooth brushing abrasion is one of the factors historically associated with the development of NCCLs. Erosion is a well-known cause of tooth surface loss and has been associated with non-cariou lesions.<sup>[10]</sup> Tooth flexure has also been described as a cause of NCCLs and the term abfraction coined to describe the process where lesions are formed by tooth structure breaking away due to the stresses generated as a result of cuspal loading. Some authors have attempted to classify non-cariou lesions according to a single etiological factor based on the morphology of the lesions. In general, shallow saucer-shaped lesions are attributed to an erosive etiology, wedge-shaped or grooved lesions are attributed to abrasion, and V-shaped lesions attributed to tooth flexure.<sup>[10]</sup> However, it has been clearly demonstrated that it is difficult to classify lesions in this manner based on studies which suggest that NCCLs have a multifactorial etiology.<sup>[8]</sup>

In terms of tooth location, 70% of NCCLs were on posterior teeth, 65% were on maxillary teeth, and 46% were on premolars.<sup>[10]</sup> The teeth most commonly affected, from a study of 1002 patients from 4 dental practices in Croatia, are premolars and molars, with incisors being the least affected. Clinical studies and observations have shown that cervical wear lesions are often more pronounced on incisors, canines, and premolars and more prevalent in the maxilla than in the mandible.

There are many studies have reported that the prevalence of these lesions and a range of 5–85% was reported in one review. To prove the relation of age and cervical lesion, there is study of 18555 teeth from the permanent dentition in a

population from the city of Rijeka, Croatia where the teeth with most NCCLs were the lower premolars, which also had the largest percentage of higher index levels, indicating the greater severity of the lesions. It also found that the prevalence and severity of the lesions increased with age.<sup>[11]</sup>

The destruction of tooth substance by caries or other factors requires restoration of loss tooth substance. It is often necessary to restore these cavities to prevent carious progression, to alleviate sensitivity to chemical and mechanical stimuli, to prevent further wear, to enhance aesthetics, and to facilitate partial denture construction.<sup>[12]</sup>

Before the advent of present-day materials and techniques, the restoration of such lesions involved the further destruction of tooth substance to retain the restorative materials. The major preoccupation of modern-day clinicians, however, is the use of techniques that require little or no cavity preparation and yet provide maximal retention of the restoration with minimal or no microleakage.<sup>[12]</sup>

At present, the materials of choice for restoring these lesions are glass ionomer cements (GICs), resin-modified GICs (RMGICs), polyacid-modified resin-based composites (compomers), and composite resins.<sup>[13]</sup>

Other factors that may affect the selection of restorative materials include the dentition treated, the age and gender of the patient, the type of practice either private or public health care services, socioeconomic status, and the experience of the clinician.<sup>[14]</sup>

Hence, the purpose of this study was to assess the number of cases of the cervical lesion in relation to age and gender among patient in Universiti Sains Islam Malaysia's (USIM) dental clinic. A secondary purpose was to identify the type of dental restorative materials used according to the type of teeth and type of cervical lesions and to identify the most common dental material that has been used in USIM dental clinic.

## MATERIALS AND METHODS

This is a retrospective study done on 1447 patients' folder from USIM's Dental Clinic to identify teeth that had cervical restorations in the USIM's Dental Clinic from 2008 to October 2011. The inclusion criteria are restoration done on permanent teeth divided according to the age group and redo filling material (restoration dislodge or secondary caries).

Data collection is carried out by looking into patients' folder and searching for treatment done for cervical lesion and the material used for restoration. Of 1447, 123 folders were identified with cervical restorations, and from this data, 263 teeth were noted having the cervical restorations. The patients were divided into six age groups. The first age

group consisted of patients aged 10–25 years, the second 26–35 years, the third 36–45 years, the fourth 46–55 years, the fifth 56–65 years, and the sixth over 65 years. Each of this age groups was divided into male and female. Data related to this study also include gender, type of restorative materials, type of lesions, and type of tooth. All the related data were entered and analyzed using the Statistical Package for the Social Sciences version.

**Descriptive**

Table 1 show that the 4<sup>th</sup> age group (46–55 years old) is the highest number of cases which is 39 in total (12 for male and 27 for female). For the highest number of cases for male is found in 5<sup>th</sup> age group (56–65 years old) which is 16. For the lowest number of cases for male is found in the 3<sup>rd</sup> age group (36–45 years old) which is 5. For the highest number of cases in female is found in the 4<sup>th</sup> age group (46–55 years old) which is 27. For the lowest number of cases in female is found in the 2<sup>nd</sup> age group (26–35 years old) which is 2. In the age group (66 and above) shows the lowest number of cases which is 9 in total (6 for male and 3 for female).

In Graph 1, the highest number of cervical lesions cases is in the 4<sup>th</sup> age group (10.8% for male and 24.3% for female). For male, the highest number of cases is found in the 5<sup>th</sup> age group which is 14.4%, for male, the lowest number of cases is found in the 3<sup>rd</sup> age group which is 4.5%. For female, the highest number of cases is found in the 4<sup>th</sup> age group which is 24.3%. For female, the lowest number of cases is found in the 2<sup>nd</sup> age group which is 1.8%. The lowest group is 6<sup>th</sup> group which shows 5.4% number of cases for male and 2.7% for female.

Table 2 shows that GICs have the highest usage for both CCL and also for NCCLs which are 145 in total (27 for CCLs and 118 for NCCLs). The lowest material used for CCLs is RMGIC which is 4. The lowest material used for NCCLs is sandwich techniques (ST) which is 9.

GICs show the highest usage for both CCLs and also for NCCLs which is 55.1% (10.3% for CCLs and 44.9% for NCCLs). The lowest material used for CCLs is RMGIC which is 1.5%. The lowest material used for NCCLs is ST which is 3.4%.

Table 3 shows that GICs are the highest usage for both carious anterior teeth and also for posterior teeth which are 145 in total (33 for anterior teeth and 112 for posterior teeth). The lowest material used for anterior teeth is ST which is 6. The lowest material used for posterior teeth is also ST which is 10.

In Graph 3, GICs show the highest usage for both carious anterior teeth and also for posterior teeth which are 55.1% (12.5% for anterior teeth and 42.6% for posterior teeth). The lowest material used for anterior teeth is ST which is

**Table 1:** Distribution of age and gender and total numbers of cervical lesions cases among patients

Age group	Gender		Total
	Male (M)	Female (F)	
10–25	7	4	11
26–35	9	2	11
36–45	5	9	14
46–55	12	27	39
56–65	16	11	27
66 and above	6	3	9
Total	55	56	111

**Table 2:** Type of materials and type of lesions

Type of dental restorative materials	CCL	NCCL	Total
Composite	19	41	60
GICs	27	118	145
RMGICs	4	38	42
Compomers	-	-	-
ST	7	9	16
Total	57	206	263

CCL: Carious cervical lesion, NCCL: Non-carious cervical lesion, GICs: Glass-ionomer cements, RMGICs: Resin-modified glass ionomer cement, ST: Sandwich techniques

**Table 3:** Distribution of lesion and type of materials

Type of dental restorative materials	Anterior teeth	Posterior teeth	Total
CR	30	30	60
GICs	33	112	145
RMGICs	18	24	42
Compomers	-	-	-
ST	6	10	16

CR: Composite resins, GICs: Glass ionomer cements, RMGICs: Resin-modified glass ionomer cements, ST: Sandwich techniques

**Table 4:** The relationship between gender, age, and cervical lesions

Variables	Standardized beta	t-stat (df)	P
Age	-0.293	-4.943 (1)	<0.001
Gender	0.007	0.121 (1)	0.904

2.3%. The lowest material used for posterior teeth is also ST which is 3.8%.

Table 4 shows from this study; it was found that there is a statistically significant relationship between age and cervical

lesions with  $P < 0.05$ , respectively. On the other hand, gender factor has no significant difference with the incidence of cervical lesion. The confidence level is 95%.

It is also found that there is no significant difference between type of materials used and type of lesions.

## DISCUSSIONS

There is a strong association between age and cervical lesions. In this study, it is found that there is a relationship between age and cervical lesions with  $P < 0.001$ . In a study by Borcic *et al.*,<sup>[11]</sup> which divided the population into six age groups, it was found that the number of lesions increased with age. These data are in agreement with our results. With increased age, the frequency of all NCCL also increased. The fourth age group shows that the frequency of these levels increased up to 10%. In a study done by Smith *et al.*,<sup>[8]</sup> when persons younger than 65 were compared with persons over 65, it was found a higher association of having lesions in the over 65 age group.

Apparently, this study shows decreasing in the percentage of a number of cases in over 65 age group. The size of the sample in USIM dental clinic and the small number of persons over 65 may account for the different findings in this study.

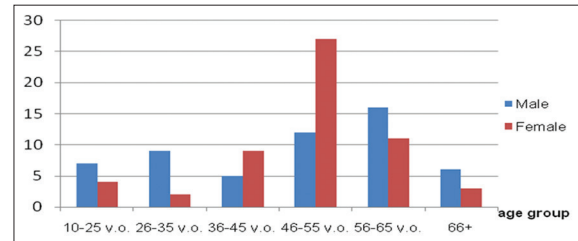
Meanwhile, gender has no significant differences with the type of lesions. By comparing the percentages between male and female patients, it shows that the ratio is 1:1 (49.6%: 50.4%) and thus shows no significant differences. This finding is also supported by Aw *et al.*,<sup>[15]</sup> older patients were more likely to exhibit NCCLs, but there is no great difference in incidence was found between men and women.

There are also no significant differences between type of materials and type of lesions. From this study, it is found that GIC is the most material used for carious lesions and non-carious lesions, thus shows no significant differences. From the literature review, there is no specific study that mentioned about the best material of choice to use for restoring cervical lesions, as shown in Table 5.

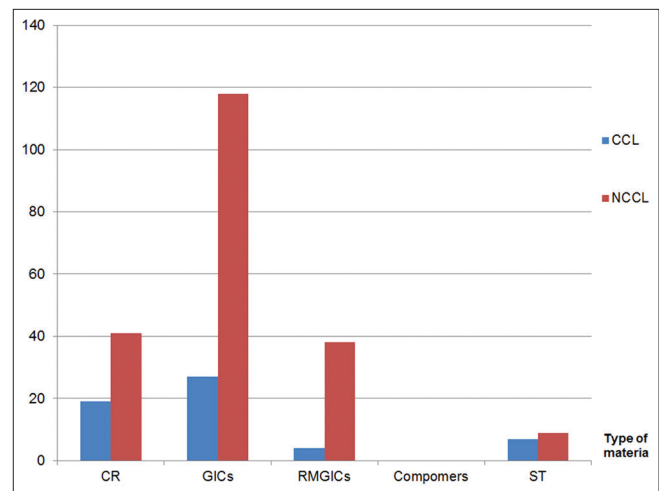
The study shows that there is no difference in restoring different type of teeth using a different type of materials. For anterior teeth, the highest percentage of material used is 12.5% which is GICs. For posterior teeth, the highest percentage of material used is 42.4% which is GICs. There is large difference in data collected (anterior teeth = 87 and posterior teeth = 176) may influence the result. Aw *et al.*<sup>[15]</sup> reported that cervical lesions were more common with posterior maxillary teeth and premolars, especially first premolars, which had the highest prevalence of lesions.

**Table 5:** Association between type of materials used with type of lesions

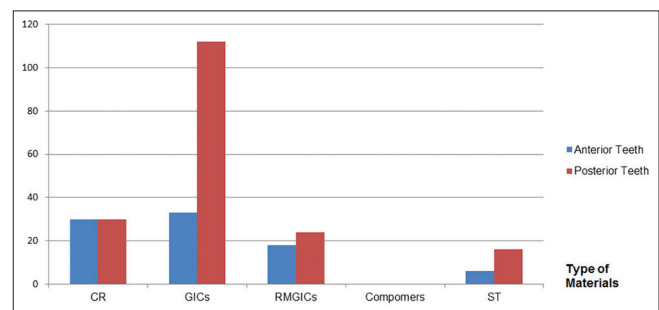
Variables	Mean (SD)	Mean<	P
Non-caries	2.07 (0.888)	-0.08	0.902
Caries	2.09 (1.23)	-	-



**Graph 1:** Percentage of distribution of age and gender and total numbers of cervical lesions cases among patients



**Graph 2:** Percentage of usage of restoration materials and type of lesions



**Graph 3:** Distribution of lesion and type of materials

The most common material used in USIM's Dental Clinic is GICs. Percentage of GICs usage in USIM's Dental Clinic is 54.9%. Contradictory, in a study done by Neo and Chew,<sup>[16]</sup> reported RMGIC as the best material for restoring NCCL, as shown in Graph 2. The result may be influenced by the availability of materials in the clinic and GICs might be

one of the materials that presence in the clinic since 2009. As USIM's dental clinic is a learning institution, different opinion from different supervisors may influence the material of choice used.

## CONCLUSIONS

It is concluded that the age factor has a strong influence toward cervical lesion and GICs are the most common material used in USIM's dental clinic. There is no association between gender and cervical lesions. No association related between type of restorative material and type of lesions. There is no association between type of tooth and type of restorative material with cervical lesions.

## REFERENCES

1. Theodore MR, Harald OH, Edward JS. Art and Science of Operative Dentistry. 5<sup>th</sup> ed. St. Louis, Mo: Sturdevant's Mosby Elsevier; 2006.
2. Terry DA, McGuire MK, McLaren E, Fulton R, Swift EJ Jr. Perioesthetic approach to the diagnosis and treatment of carious and noncarious cervical lesions: Part II. J Esthet Restor Dent 2003;15:284-96.
3. Gupta B, Marya CM, Juneja V, Dahiya V. Root caries: An aging problem. Internet J Dent Sci 2007;5:121-9.
4. Imazato S, Ikebe K, Nokubi T, Ebisu S, Walls AW. Prevalence of root caries in a selected population of older adults in Japan. J Oral Rehab 2006;33:137-43.
5. Oral Health Division, Ministry of Health Malaysia. 2000. National Oral Health Survey of Adults 2000 (NOHSA 2000) November; 2004 MOH/K/GIG/5.2005(BK).
6. Yoshihara A, Takano N, Hirotsomi T, Ogawa H, Hanada N, Miyazaki H. Longitudinal relationship between root caries and serum albumin. J Dent Res 2007;86:11115-9.
7. Bartlett DW, Shah P. A critical review of non-carious cervical (wear) lesions and the role of Abfraction, Erosion, and Abrasion. J Dent Res 2006;85:306-12.
8. Smith WA, Marchan S, Rafeek RN. The prevalence and severity of non-carious cervical lesions in a group of patients attending a university hospital in Trinidad. J Oral Rehabil 2008;35:128-34.
9. Levitch LC, Bader JD, Shugars DA, Heymann HO. Non-carious cervical lesions, Elsevier. J Dent 1994;22:195-207.
10. Lussi A, Jaeggi T, Schaffner M. Diet and dental erosion. Nutrition 2002;18:780-1.
11. Borcic J, Anic I, Urek MM, Ferreri ES. The prevalence of non-carious cervical lesions in permanent dentition. J Oral Rehabil 2004;31:117-23.
12. Sidhu SK. A comparative analysis of techniques of restoring cervical lesions. Quintessence Int 1993;24:553-9.
13. Jyothi KN, Annapurna S, Kumar AS, Venugopal P, Jayashankara CM. Clinical evaluation of giomer and resin-modified glass ionomer cement in class V non-carious cervical lesions: An *in vivo* study. J Conserv Dent 2011;14:409-13.
14. Mjølør IA, Moorhead JE, Dahl JE. Selection of restorative materials in permanent teeth in general dental practice. Acta Odontol Scand 1999;57:257-62.
15. Aw TC, Lepe X, Johnson GH, Mancl L. Characteristics of noncarious cervical lesions: A clinical investigation. J Am Dent Assoc 2002;133:725-33.
16. Neo J, Chew CL. Direct tooth coloured materials for non-carious lesions: A three year clinical report. Quintessence Int 1996;27:183-8.

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