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Review Article

The Risk Factors and Interventions of Dental Caries in the Elderly: A Narrative Review

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ABSTRACT

As the human lifespan increases, older adults are known to retain their teeth for longer. Dental clinicians will see an increase in the number of elderly patients as the population's life expectancy rises. The loss of periodontal attachment is a common risk factor for root surface caries development in older adults. Other risk factors include an increase in the number of missing teeth and restorations, prosthesis wearing, reduced manual dexterity, a shift in diet from complex to simple sugars, salivary gland dysfunction and increased salivary glucose levels. Dental caries is one of the causes leading to tooth loss in older adults and tooth loss significantly impacts the oral health-related quality of life for this vulnerable age group. Furthermore, the treatment of root caries is complicated by the adhesion of restorative materials to dentin and cemental layer. To curb these issues, understanding the risk factors for dental caries in the elderly, as well as its prevention and treatment strategies, is therefore crucial. This narrative review aims to provide an understanding of dental caries in older adults and an evidence-based prevention and management of this dental disease.

Keywords: *Dental caries, root caries, aged, risk factors*

Abbreviations: *APF–acidulated phosphate fluoride, CHX–chlorhexidine, CRT® -caries risk test, Na_3PO_4F –sodium mono fluorophosphate, NaF–sodium fluoride, RPD–removable partial denture, SDF–silver diamine fluoride, SnF_2–stannous fluoride*

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INTRODUCTION

Dental caries among the elderly population is becoming increasingly common due to increased life expectancy and the emerging trend that old people are retaining their teeth for longer (Gati & Vieira, 2011). Dental clinicians will be treating a larger number of these patients as the population ages. The World Health Organisation in 2022 estimated that more than 3.5 billion cases of oral diseases and other oral conditions were reported in 2017, most of which are preventable. Dental caries, as known, develops when four aetiological factors coexist: substrate, bacteria, surface, and time. The word “substrate” refers to a diet involving sugar intake. The most cariogenic sugar leading to caries is sucrose, including many other low molecular weight simple carbohydrates which are as highly cariogenic. They are glucose, lactose and fructose (Yip & Smales, 2012). In addition, the frequency rather than the total amount of sugar intake is significant in caries initiation (Gussy *et al.*, 2006). Older adults are believed to consume a more cariogenic diet (de Mata *et al.*, 2011), making it imperative to predetermine the frequency of sugar intake in their daily diet and medication intake during caries risk assessment.

Bacteria in dental plaque, primarily *Streptococcus mutans*, ferment carbohydrates and produces acids as a by-product. These acids lower the intraoral pH and cause apparent mineral loss from the tooth surface (Gussy *et al.*, 2006). A study by Lundgren et al. (1997) found that the number of lactobacilli increases with age (Lundgren *et al.*, 1997) and they are shown to cause the progression of deep carious lesions rather than the initiation of dental caries itself (Mittal *et al.*, 2021). Susceptible tooth surfaces such as the occlusal anatomy and rough root surfaces attract biofilm adherence and bacterial colonisation. The pits and fissures are practically inaccessible to the bristles of a toothbrush, facilitating caries progression to the deeper structures.

Older adults who are immunologically compromised and/or on medications for xerostomia, for example, can have their bodies' defence mechanism for bacterial elimination obliterated (Gussy *et al.*, 2006). Over time, when the rate of demineralisation dominates the rate of remineralisation, caries develops. Older adults are more susceptible to dental caries, particularly root caries, due to the increased risk factors which are challenging to tackle and generally require regular monitoring for maintenance and prevention of recurrence. This narrative review aims to provide an understanding of the mechanisms of dental caries in the elderly and to discuss its evidence-based prevention and management strategies.

RISK FACTORS IN THE ELDERLY

Periodontal disease and root surface exposure

Root surface exposure caused by gingival recession is a prerequisite to caries formation (Tan & Lo, 2014, Hayes *et al.*, 2016). An exposed root surface leads to exposure of the cementum (Hayes *et al.*, 2016). The cemental layer is an outer layer of the root that offers protection to the inner dentin from initial demineralisation (Hayes *et al.*, 2016, Dietz *et al.*, 2002). During periodontal therapy, this surface layer is scraped off, exposing the dentin underneath (Hayes *et al.*, 2016, Mellberg *et al.*, 1986). Because the dentin has a lower mineral content than that of enamel, the required critical pH for demineralisation to occur is higher, approximately 6.4 compared with 5.5 in enamel (Bignozzi *et al.*, 2014). This is one of the possible reasons why root caries is generally more detrimental and will occur first before coronal caries. An explanation of the mechanism of root caries formation is shown in Figure 1.

Periodontal pockets act as a reservoir for plaque accumulation and subsequent bacterial colonisation and multiplication. When saliva is unable to reach these deep pockets, the pH drops from the lack of buffer, further favouring the growth of bacteria (Bignozzi *et al.*, 2014). Hence, caries easily develops, progresses and goes unnoticed, until symptoms arise. Involvement of the furcation in the molar teeth due to clinical attachment loss makes it hard to clean, and this makes the furcation areas more likely to become carious (Bignozzi *et al.*, 2014).

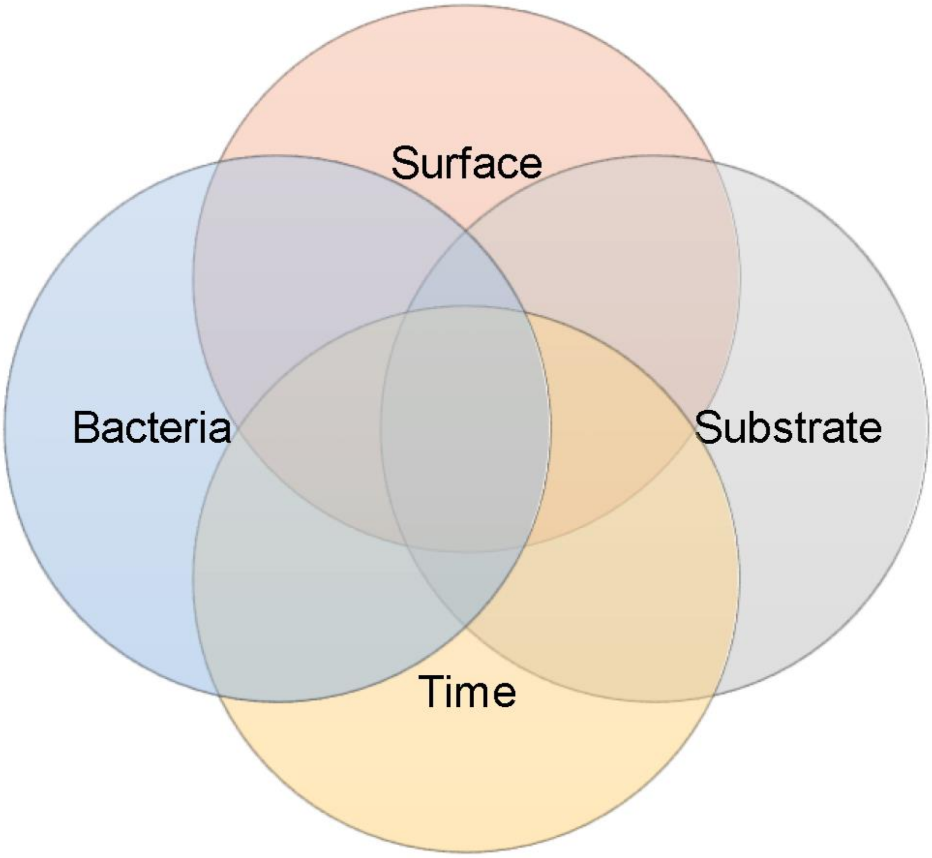

Fig: 1 Root caries formation.

Systemic diseases and diet

The prevalence of systemic diseases such as cardiovascular diseases, type 2 diabetes mellitus, dementia, and cancer is increasing as the life span increases (Petelin *et al.*, 2012, Gavriilidou & Belibasakis, 2019). A prolonged disease frequently affects the disease progression and quality of life and indirectly produces negative impacts on an elderly person's oral health. An impaired immune system promotes bacterial colonisation and increases the incidence of caries, making the elderly more susceptible to dental caries and periodontal disease (Preza *et al.*, 2008, Mohamed *et al.*, 2013). In addition, certain prescribed medications require chewing or swallowing in the form of liquid and they are made sweet, commonly with sucrose, to mask the bitterness of the "raw" medicine (Baqir & Maguire, 2000).

Older adults are said to consume a more cariogenic diet (de Mata *et al.*, 2011). Sugar is used as a preservative, and it is also added to cluster food substances together (Paglia, 2019). There is an issue with "hidden" sugar when looking at sugar-free alternatives (Gupta *et al.*, 2013). Often the sugar is labelled as another, such as dextrose, glucose and fructose which creates confusion and gives a false impression that the food is sugar-free (Koivistoinen & Hyvönen, 1985). Bacteria present in the biofilm metabolises sugar, mainly sucrose, by producing acids as its by-product (Gussy *et al.*, 2006). Frequent sugar intake gives insufficient time for the saliva to neutralise these acids (Gupta *et al.*, 2013). A prolonged drop in pH below the critical level allows the demineralisation process to surpass remineralisation (Gupta *et al.*, 2013). This results in a net loss of tooth structure leading to caries. Reducing the frequency of sugar intake can significantly reduce the incidence of caries, as this leaves enough time for saliva to neutralise the acids.

Quantity and quality of saliva

The presence of saliva is vital as a pH neutraliser and food debris cleanser. Saliva is also known to have antimicrobial properties. Hyposalivation in older people as a result of Sjogren's syndrome, head and neck irradiation, poor general health or medication is associated with an increased risk of caries (Gati & Vieira, 2011, Gupta *et al.*, 2013). The salivary reserve is also reduced in older people due to the physiological changes within the salivary glands. Medications act in one of two ways; by directly reducing the salivary flow or producing the symptoms of xerostomia by altering the salivary quality (Thomson *et al.*, 2002). Reduced salivary flow rate and quality of saliva promotes biofilm adherence and bacterial colonisation within the tooth surfaces (Gati & Vieira, 2011) and the effect is illustrated in Figure 2.

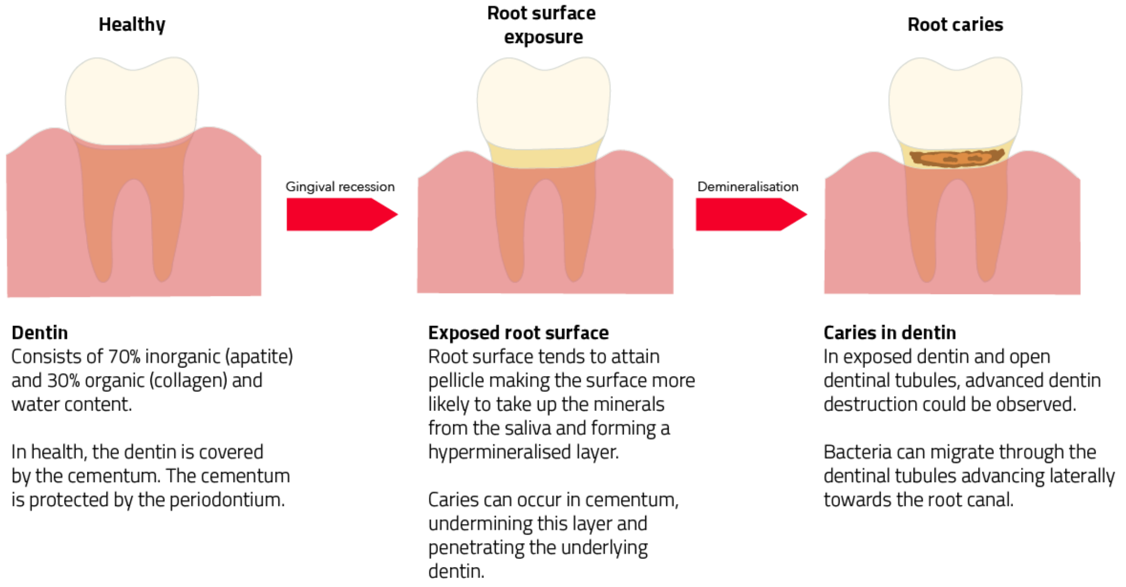

Fig: 2 The Stephan curve shows the pH values in the oral cavity upon exposure to sugar. The tooth surface is subject to demineralisation when the pH drops below the critical level. The presence of saliva neutralises this pH and promotes remineralisation. Altered saliva quantity and quality predispose the tooth surface to root and coronal caries.

Presence of prostheses

Removable partial dentures (RPDs) are a treatment option that are fairly common in the replacement of missing teeth as they are one of the cheapest alternatives (Lynch, 2012). Jorge et al. (2012) showed that patients wearing RPDs had a significant increase in bacteria loading, leading to an increased risk of caries (Jorge *et al.*, 2012). An improper denture design could be one of the contributing factors (Lynch, 2012). Tan and Lo (2014) in their study found that exposed root surfaces that were in contact with denture components promoted plaque accumulation and were a prerequisite to root caries. Stilwell (2010) suggested that RPD components should be located about three millimetres away from the gingival margin and proximity with adjacent natural teeth avoided to ensure cleansability. This is supported by Hayes (2016) who found the proximity of RPDs to the teeth was a risk factor for caries. Night-time denture wearing also results in more plaque accumulation compared to those who only practice daytime denture wearing (Milward *et al.*, 2013). The detrimental effects of having multiple prostheses inside the mouth are depicted in Figure 3.

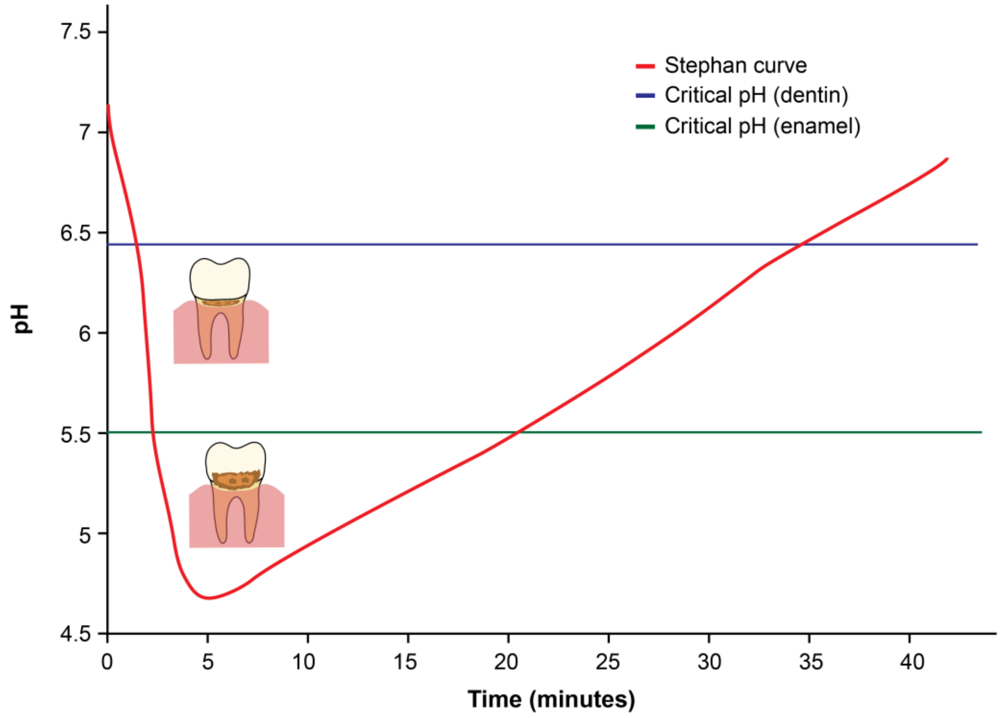

Fig: 3 A patient presented with multiple indirect restorations and removable partial denture. Note the presence of root exposure on the maxillary premolars, possibly from periodontal disease, resulting in root caries.

Oral hygiene and dexterity

A 30-year follow-up study in a group of adults by Axelsson et al. (2004) showed a good plaque control led to a reduction in the incidence of periodontal attachment loss and caries. Caries initiates when acids produced by bacteria colonies present in the biofilm start to demineralize the tooth structure. Mechanical cleaning of teeth with a toothbrush, fluoridated toothpaste, and floss or interdental brush is what constitutes proper oral hygiene and aids the removal of the biofilm (Slot *et al.*, 2020). The technique, frequency, and duration of cleaning are also important in ensuring sufficient removal of the biofilm and preventing build-up (Militz *et al.*, 2013). With age, having missing teeth creates gaps, leaving the proximal surfaces susceptible to plaque accumulation and complicates cleaning as these surfaces are unreachable to a normal toothbrush. A single tufted toothbrush design, in this case, aids daily cleaning. However, an incorrect usage technique of this toothbrush gives practically no benefits to its use (Lee & Moon, 2011), hence oral hygiene demonstration is important. Mouthwash usage with or without mechanical debridement (toothbrushing and flossing) reduces plaque accumulation and prevents periodontal diseases (FDI Commission, 2002). A study by Sánchez-García et al. (2011) revealed that older adults who did not use mouthwash had a higher incidence of dental caries.

Ageing is associated with reduced physical capability and visual acuity (Gati & Vieira, 2011). Medical conditions such as rheumatoid arthritis and sarcopenia reduce manual dexterity, impairing the ability to perform basic oral hygiene practices. Additionally, deteriorating general health affects an individual's quality of life, causing them to disregard their oral health (de Mata *et al.*, 2011). Reduced physical capability also limits the number of dental visits. Individuals who live in rural areas where access to dental treatment is a problem are more susceptible to developing dental caries (Petelin *et al.*, 2012). A study by Simons et al. (2001) on elderly people living in residential homes showed the residents' perceived need for oral hygiene assistance was related to their oral hygiene status.

Social factors

In the United States, even though the root caries incidence was lower in the black community, they showed more severity compared to the whites (Graves *et al.*, 1992). This was due to the sociodemographic and economic factors that led to the blacks having a lack of access to dental treatment and awareness towards dental health. A study on the middle-higher income older adults of Singapore saw that with decreasing income, the number of missing and decayed teeth was higher and the number of filled teeth was lower (Mittal *et al.*, 2021).

PREVENTION

Caries prevention should supersede treatment in preventing further tooth loss among this age group. Prevention does not only reduce the cost of treatment, but it is also minimally invasive, relatively easy and increases tooth longevity (Källestål *et al.*, 2003).

Caries risk assessment, sugar and diet

Caries risk assessments provide beneficial information in the direction of caries prevention (Doitchinova *et al.*, 2020). CRT® (Caries Risk Test, Ivoclar Vivadent) provides analysis tools for caries risk. CRT® bacteria helps determine the count of *Streptococcus mutans* and lactobacilli in saliva (Babu *et al.*, 2019). CRT® buffer, on the other hand, determines the buffering capacity of saliva (Maldupa *et al.*, 2011). A high bacterial count and low buffering capacity indicate a high caries risk and allow clinicians to make early caries prevention decisions. Moreover, individuals with past caries experience, recognised by the presence of multiple restorations or tooth loss due to caries, are more likely to develop new caries and must be regarded as having a high caries risk (Powell, 1998). Individuals with reduced salivary quantity and quality from poor general health or medications also have an increased risk for caries. Salivary substitutes and sugar-free chewing gums can be prescribed to stimulate salivary flow (Walls & Meurman, 2012).

Sugar replacement with sweetening agents reduces the risk of caries. Evidence suggests using sugar alcohol (e.g., Xylitol) as a sugar substitute for caries prevention due to its anti-cariogenic effect and the fact that it is not readily metabolised by bacteria (Lynch & Milgrom, 2003). Dental-related sugar alcohol use has its drawbacks as it may cause osmotic diarrhoea (Walls & Meurman, 2012). Makinen and Söderling (1984), however, stated that the dose recommended for dental use of sugar alcohol is too low to cause diarrhoea and that the benefits of sugar alcohol in dental prophylaxis outweigh its side effects.

Fluoride

A great deal of evidence is available on the role of fluoride in caries prevention among children and adults. Fluoride is a mineral that has been proven to have the ability to remineralise enamel that is subjected to caries attack. It can also directly prevent the demineralisation of the enamel. Fluoride can be added to a variety of media including drinking water, toothpaste, gels, varnishes and milk (Iheozor-Ejiofor *et al.*, 2015). Fluoride tablets are also available for those children who have higher caries risks. Griffin *et al.* (2007), in their systematic review, found that fluoride exposure, in any form, reduced caries by 25% among adults, which is almost similar to findings in children. Fluoride efficacy may be influenced by the fluoride compound, frequency of use, duration of exposure, concentration and method of delivery (Zero, 2006).

Fluoride dentifrices have been shown to demonstrate caries inhibiting effects on the permanent dentition. The three sources of fluoride that are effective in dentifrices are sodium mono fluorophosphate (Na_3PO_4F), sodium fluoride (NaF), and stannous fluoride (SnF_2). The concentration of fluoride that is often used in dentifrices in European countries is 1500 ppm (Zero, 2006). A study by Jensen and Kohout (1988) indicated the effectiveness of fluoride dentifrices when used in older adults even in the presence of fewer unrestored surfaces. They were shown to be effective at reducing root surface caries (Jensen & Kohout, 1988). Through their study, Petersson et al. (2007) showed the effectiveness of amine fluoride dentifrices and rinses at remineralising root caries lesions when used twice daily. The addition of professional application of acidulated phosphate fluoride (APF) to the use of fluoride dentifrices is believed to provide additional protection to the dentine which prevents demineralisation and reduces the risk of root caries development compared to the use of fluoride dentifrices alone (Vale *et al*., 2011).

The ability of dentifrices to retain fluoride ions for longer inside the oral cavity depends on how they are being used. The frequency of toothbrushing with fluoride dentifrices twice daily or more, the longer duration of brushing and no rinsing after toothbrushing leads to fluoride lingering on the surface of the tooth. Reduced salivary flow during sleep lessens the action of fluoride clearance (Zero, 2006). Therefore, brushing teeth before going to bed is beneficial compared to brushing teeth upon waking up in the morning.

Antimicrobial rinses and varnishes

Antimicrobial rinses containing sodium fluoride and chlorhexidine (CHX) have an anticaries effect and reduce caries risk (Featherstone *et al.*, 2012, Papas *et al.*, 2012). Application of sodium fluoride (Jabir *et al.*, 2021) and CHX varnishes and silver diamine fluoride (SDF) solutions also have the same effect and are effective at preventing root caries and for those who are at high risk of caries (Papas *et al.*, 2012, Tan *et al.*, 2010).

Streptococcus mutans is among the bacteria responsible for the initiation of root caries (Mittal *et al.*, 2021). CHX acts by inhibiting *Streptococcus mutans,* which leads to inhibition of plaque formation and subsequent inhibition of acid production that causes mineral loss from the tooth structure (Slot *et al.*, 2011). Systematic reviews by Slot *et al.* (2011) and Papas *et al.* (2012), however, claimed that the evidence supporting the benefits of CHX varnish is weak, especially for coronal caries prevention. Nevertheless, Papas *et al.* (2012) stated that CHX varnish may be beneficial for root caries prevention. Further studies would be beneficial to look into the effectiveness of CHX in caries prevention. The caries preventive interventions with coronal and root caries outcomes are shown in Tables 1 and 2.

TREATMENT

When caries develops and becomes an irreversible cavitated lesion, its total removal is imperative prior to restoration placement, in preventing secondary caries. Partial caries removal to preserve the pulpal tissue is no longer permissible due to its low success rate.

Step-wise excavation technique

In deep caries lesions, a step-wise excavation technique may be used to ensure complete caries removal while preserving pulpal vitality and preventing post-operative pulpal symptoms. This technique requires two visits. At the first visit, complete removal of peripheral caries is performed, followed by the placement of a calcium hydroxide liner and a temporary dressing. The cavity is then re-entered at the second visit, usually 8-12 weeks later, to remove the remaining caries (Browning, 2015). Caries removal is performed using a sterile, round bur with a slow-speed handpiece. Ersin et al. (2009) suggested using 2% CHX gluconate disinfection to eliminate residual bacteria before restorative material placement did not affect the bond strength of glass ionomers and composite resins.

Table 1: Caries preventive studies with coronal caries outcome

Article	Study type	Mean age	Grouping/ preventive treatment	Follow-up period	Results	
					No. of subjects	Outcome
Al-Haboubi et al. (2012)	RCT	70.2	*Gp1*: xylitol chewing gum 2x/day for 15 minutes *Gp2*: control (no chewing gum)	6 months	146	Mean decayed coronal surfaces *Gp1*=*Gp2* (p=0.522)
Jensen and Kohout (1988)	CCT	*Gp1*: 68.5 *Gp2*: 68.6	Twice daily use: *Gp1*: placebo dentifrice (<1ppm F) *Gp2*: 1,100ppm NaF dentifrice	12 months	810	% increment of coronal caries (p=0.006) *Gp1*>*Gp2*
Ferracane et al. (2011)	RC	3-92	Prophylaxis, fluoride (varnish and APF, SnF, NaF), sealant	Past 12 months	1877	Prophylaxis – no significant association with new carious lesions Fluoride – significant greater odd at having new lesions
Fure et al. (1998)	PC	71.5	1,500ppm NaF toothpaste and: *Gp1*: 0.05% NaF rinse (2x/day) *Gp2*: 1.66mg NaF tablet (2x/day) *Gp3*: brush with *slurry* toothpaste rinsing technique (3x/day) *Gp4*: control (brush as usual)	2 years	164	Mean total caries increment *Gp1*<*Gp4* (p<0.002)
Powell et al. (1999)	RCT	60+	*Gp1*: control *Gp2*: OHE *Gp3*: OHE + weekly 0.12% CHX rinse *Gp4*: as *Gp3* + fluoride varnish *Gp5*: as *Gp4* + six-monthly Sc & RP	3 years	201	Average rate of coronal caries, fillings and extractions (*Gp1*+*Gp2*)=(*Gp3*+*Gp4*+*Gp5*) p=0.09
Rothen et al. (2014)	RC	9 -65+	Fluoride toothbrushing, water rinse after brushing, interproximal cleaning, other fluoride products	Past 24 months	1400	<u>Mean caries rate</u> Fluoride toothbrushing frequency (No or <1x/day)>2x/day
Wyatt et al. (2007)	RCT	67.5	Daily rinsing for 1 month & weekly rinsing for 5 months *Gp1*: 0.12% CHX rinse *Gp2*: placebo rinse	5 years	828	% of coronal surfaces remained sound *Gp1*=*Gp2* (p=0.21)

RCT randomized controlled trial *CCT* controlled clinical trial *PC* prospective cohort *RC* retrospective cohort *Gp* group *ppm* parts per million, *OHI* oral hygiene instructions, OHE oral hygiene education, *Sc* scaling, *RP* root planing, NaF sodium fluoride, *SnF* stannous fluoride, *CHX* chlorhexidine, *APF* acidulated phosphate fluoride

Table 2: Caries preventive studies with root caries outcome

Article	Study type	Mean age	Grouping	Follow -up period	Results	
					No. of subjects	Outcome
Al-Haboubi et al. (2012)	RCT	70.2	*Gp1*: xylitol chewing gum 2x/day for 15 minutes *Gp2*: control (not given chewing gum)	6 months	146	Mean decayed root surfaces *Gp1=Gp2* (p=0.154)
Ekstrand et al. (2008)	RCT	81.6	*Gp1*: professional cleaning + Duraphat varnish monthly *Gp2*: 5,000 ppm fluoridated toothpaste 2x/day + OHI *Gp3*: 1,450 ppm fluoridated toothpaste 2x/day + OHI	8 months	189	Number of new active root caries *Gp1=Gp2*<Gp3(p<0.0 2)
Ferracane et al. (2011)	RC	3-92	Preventive treatments in the past 12 months: Prophylaxis, fluoride (varnish and APF, SnF, NaF), sealant.	Past 12 months	1877	Prophylaxis – no significant association with new carious lesion Fluoride – significant greater odd at having new lesions
Fure et al. (1998)	PC	71.5	1,500ppm NaF toothpaste and: *Gp1*: 0.05% NaF rinse (2x/day) *Gp2*: 1.66mg NaF tablet (2x/day) *Gp3*: brush with *slurry* toothpaste rinsing technique (3x/day) *Gp4*: control (brush as usual)	2 years	164	Mean total caries increment *Gp1<Gp4* (p<0.002)
Jensen and Kohout (1988)	CCT	*Gp1*: 68.5 *Gp2*: 68.63	Twice daily use: *Gp1*: placebo dentifrice (<1ppm F) *Gp2*: 1,100ppm NaF dentifrice	12 months	810	% increment of root caries (p=0.014) *Gp1>Gp2*
Powell et al. (1999)	RCT	60+	*Gp1*: control *Gp2*: OHE *Gp3*: OHE + weekly 0.12% CHX rinse *Gp4*: as *Gp3* + fluoride varnish *Gp5*: as *Gp4* + six-monthly Sc & RP	3 years	201	Average rate of root caries, fillings and extractions (*Gp1+Gp2*)= (*Gp3+Gp4+Gp5*) p=0.15
Rothen et al. (2014)	RC	9-65+	Fluoride toothbrushing, water rinse after brushing, interproximal cleaning, other fluoride products	Past 24 months	1400	65+ population: Mean caries rate Fluoride toothbrushing frequency (No or <1x/day)>2x/day
Wallace et al. (1993)	CCT	60+	*Gp1*: daily placebo mouth rinse *Gp2*: semi-annual application of topical APF gel *Gp3*: daily 0.05% NaF rinse	48 months	466	Number of new root caries lesion *Gp1>Gp2* (p<0.05) *Gp1=Gp3* (p=0.19)

Wyatt et al. (2007)	RCT	67.5	Daily rinsing for 1 month & weekly rinsing for 5 months: *Gp1*: 0.12% CHX rinse *Gp2*: placebo rinse	5 years	828	% of root surfaces remained sound *Gp1*=*Gp2* (p=0.42)
Zhang et al. (2013)	RCT	72.5	*Gp1*: annual OHI + placebo (water) *Gp2*: annual OHI + 38% SDF solution *Gp3*: annual OHI + 38% SDF solution + 6-monthly OHE All professionally applied.	24 months	266	Mean number of new root caries surfaces *Gp1*>*Gp2*>*Gp3* (p<0.05)

RCT randomized controlled trial *CCT* controlled clinical trial *PC* prospective cohort *RC* retrospective cohort *ppm* parts per million, *OHI* oral hygiene instructions, OHE oral hygiene education, *Sc* scaling, *RP* root planing, NaF sodium fluoride, *SnF* stannous fluoride, *CHX* chlorhexidine, *APF* acidulated phosphate fluoride, *SDF* silver diamine fluoride

Restorative materials

In the past, amalgam was widely used for its strength, longevity and predictability. However, due to poor aesthetics and concerns with amalgam toxicity, amalgam use is now limited. Composite resins are known to have little fluoride-releasing properties and are prone to microleakage, which is often a setback for their use. Moreover, the *Streptococcus mutans* count in teeth restored with composite resin restoration is found to be higher compared to teeth restored with amalgam restoration (Mittal *et al.*, 2021).

Glass ionomers are well known for their fluoride-releasing properties and ability to inhibit secondary caries (Randall & Wilson, 1999). The poor abrasion resistance and strength of this restorative material limit its use. However, glass ionomer may be beneficial in managing root caries and cervical abrasion cavities because of its ability to bond chemically to dentine (Berg & Croll, 2015, McComb *et al*., 2002). Compomers and resin-modified glass ionomers (RMGIs) incorporate both composite resin and glass ionomers in the materials to enhance their properties and are suitable alternatives for root caries restoration in the elderly (McComb *et al*., 2002).

This review goes over the risk factors, prevention, and treatment of dental caries in the elderly. The loss of periodontal attachment, which exposes the root surface, the increased number of missing teeth and restorations, prosthesis wearing, reduced manual dexterity, a shift in diet from complex to simple sugars, salivary gland dysfunction, and increased salivary glucose levels are all risk factors for caries development. Prevention efforts should be holistic, by targeting the key risk factors and complemented by an integrated public health approach applying non-communicable disease prevention strategies, including social and private sector activities that affects the elderly’s oral health, i.e., commercial determinants of dental caries (World Health Assembly, 2022). The controversy surrounding the adhesion of restorative materials to dentin and cementum complicates the treatment of root caries even more. Studies in this area are still lacking, and we believe that additional research in dental caries focusing on older adults will benefit policymakers and healthcare providers in their collaborative efforts.

CONCLUSION

Dental clinicians will be treating a larger number of elderly people as their life expectancy increases. The understanding of the risk factors of dental caries among this age group and the strategies for prevention and treatment is crucial, especially for policymakers in initiating collaborative efforts between oral health programmes and primary and secondary health services. This narrative review has contributed to the understanding by providing a comprehensive compilation of discussion of dental caries risk factors and its management strategies in the elderly.

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