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Oral Soft Tissue Changes In Geriatric Patients

Research Article

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Abstract

As an individual ages, changes occur both in physical processes and metabolic processes of the organism. It is the inability of individual cells to replicate themselves beyond a certain point and also having diminished metabolic activity. When specific to age, most structural and functional changes are so closely related to impaired cell regeneration and metabolic cellular activity which affects the homeostatic condition. Changes in oral mucosa are apparent after the age of 70, due to many metabolic disorders, it occurs soon or earlier in their life. The tissue appears satiny and shiny with stretched appearance, which is accompanied by loss of resilience and elasticity with friable surface and oedema. The aim of this review is to find out the influence of the oral soft tissue changes in geriatric patients. This research was conceived as scoping literature review. This review has accessed existing reviews and researches in the last decade mostly, through PMC database, MeSH, Google Scholar, Pubmed, Medline, CrossRef and the search terms included were 'oral soft tissue change', 'oral mucosal lesions', 'salivary gland', 'tongue'. Considered research was limited to manuscripts related to english, to geriatric patients, oral soft tissue changes, oral mucous membrane. This review excluded non english researches, other oral problems, oral soft tissue changes not in geriatric patients and oral hard tissue structures. Quality of articles used was assessed using Quality assessment tools. The description of included studies for the review is tabulated. The influence and effect of oral soft tissue changes in the geriatric patients is well understood and the treatment and care can be given to them by this knowledge of review. These general guidelines can be used to exclude most oral soft tissue changes (oral lesions in particular) from clinical differential diagnosis, and guide the next step in management of a patient's problem. Final diagnosis requires additional testing like biopsy spectrum, etc.

Keywords: Oral Soft Tissue; Oral Mucous Membrane; Oral Mucosal Lesion; Periodontium; Salivary Gland.

Introduction

As an individual ages, changes occur both in physical processes and metabolic processes of the organism of the organism. It is the inability of individual cells to replicate themselves beyond a certain point and also having diminished metabolic activity. When specific to age, most structural and functional changes are so closely related to impaired cell regeneration and metabolic cellular activity which affects the homeostatic condition [24]. It is difficult to determine if a certain disorder is due to ageing or abnormal oral habits,due to pathogenic microorganisms, drug treatment or some other irritating factors [33] and these microorganisms show variation due to climatic change [38]. Changes in oral mucosa are apparent after the age of 70, due to many metabolic disorders, it occurs soon or earlier in their life. The tissue appears satiny and shiny with stretched appearance, which is accompanied by loss of resilience and elasticity with friable surface and oedema [9]. There is a possibility of extensive keratinisation occasionally, but thinning of epithelium and loss of keratinisation more frequently are evident. So, when epithelium thins the tissue may get injured due to protein deficiency [17]. Dental professionals have higher empathy than other professionals, so they can easily communicate with geriatric patients [14], should be careful for the benefit of patients [45] and there should be better communication between surgeons and pathologists for biopsy of geriatric patients [23, 40] and should preserve evidences through photography for further diagnosis [15] and practice evidence based dentistry [2].

Previous study by David R Klein,1980 [22], the author described only major oral soft tissue changes, gave emphasis on changes on

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salivary glands, oral mucosa, tongue which is just a review article. Another study by A Jainkittivong, et al, 2002 [18] studied on determination of oral mucosa lesions, as a result of the study, the oral soft tissue changes of about 83.6% in 500 geriatric patients and was concluded that the oral soft tissue changes in these patients are due to denture use and other prosthesis use, having higher incidence. The previous researches give us enough knowledge on this topic of review.

The limitations of most previous researches are they have given only systematic reviews or study (cross sectional) on a small population of the most common oral soft tissue, but it differs between regions, locality, altitudes, temperatures of that region, countries and also between population of oral habit and non oral habit population. This study topic is a vast field to discuss, but the knowledge of the soft tissue changes would be very useful for prosthodontists, or any department dealing with oral cavity needs to know to treat geriatric patients and the aim of this review is to find out the influence of the oral soft tissue changes in geriatric patients.

Methodology

This research was conceived as scoping literature review. This review has accessed existing reviews and researches in the last decade mostly, through PMC database, MeSH, Google Scholar, Pubmed, Medline, CrossRef and the search terms included were 'oral soft tissue change', 'oral mucosal lesions', 'salivary gland', 'tongue'. Considered research was limited to manuscripts related to english, to geriatric patients, oral soft tissue changes, oral mucous membrane. This review excluded non english researches, other oral problems, oral soft tissue changes not in geriatric patients and oral hard tissue structures. The period of duration considered is 1971 to 2020. The total number of articles found on typing the topic is 1,24,000 and the number of articles actually relevant to the topic is 93 found by searching using keywords. The number of research articles that are used in writing the review is 40. Quality of articles used was assessed using Quality assessment tools. The level of evidence of the reviewed articles were categorised according to the criteria of Centre for Evidence-Based Medicine, Oxford, UK [19].

Changes In Salivary Glands

Oral soft tissue changes, most frequent in geriatric patients, is "Dry mouth syndrome". This is the most prevalent complaint after the age 65. This is caused by diminution of salivary flow followed by acinar destruction and hyalinization, sometimes atrophy of salivary gland ducts and infections can also be associated within stoma [6]. The disease like diabetes mellitus is the main causative disease of dry mouth syndrome that results in oral mucosal inflammation, hyperglycemia, dehydration and finally results in dry mouth. The induced insulin resistance which impairs the saliva secretory mechanisms also causes dry mouth syndrome [28].

Cause of decreased salivary flow by Sjogren's syndrome is caused by Keratoconjunctivitissicca, xerostomia and affects the middle age and older age groups are most affected. The swelling of major salivary glands is a characteristic feature of sjogren's syndrome, and also atrophy and fibrous replacement have greater significance of pathognomonic [44]. Sjogren's syndrome is mostly caused due to triggered autoimmune responses against exocrine glands [28]. Sjogren's syndrome often occurs with other disorders like rheumatoid arthritis and lupus. The treatments given are eye drops, medication and eye surgery [41].

Changes In Oral Mucous Membrane And Tongue

Normally, the change in oral mucosa occurs after age 70, the tissue appears as satiny, shiny and it is associated with loss of resilience along with oedema [3]. Mainly thinning epithelium, loss of keratinisation and the tissue is prone to injury due to protein deficiency [21]. Oral mucosal lesions among elderly population are caused mainly due to systemic diseases and also due to prosthesis, denture wearing, due to some infections, neoplasm, hematological disorders [36]. The other reason might be cotinine which is the main nicotine metabolism in tobacco products and is a dependable biomarker for tobacco exposure and it is benign and self limiting. It can also be potentially malignant; Leukoplakia, erythroplakia and oral submucous fibrosis which are common precancerous lesions [34]. The prevalence of these lesions is more especially in the Indian subcontinent due to the high prevalence of tobacco consumption.

Tongue is the most frequent site, caused by benign change, slight fissuring. The dorsal surfaces have changes in texture that begin with minor atrophy of filiform papillae at tip, completely lacquered tongue [26]. Development of a persistent ulceration occurs on the lateral border of tongue and also has the presence of infiltration of immature cells, scare cytoplasm, and hyperchromatic nuclei [27]. The tongue represents 35% of oral cavity squamous cell carcinoma along with high lymphatic spread, the non lymphatic distant spread is observed in 10% of the cases [39].

Glossodynia along with benign migratory glossitis causes desquamation of filiform papilla and also macroglossia, tumours [43]. Burning mouth syndrome is a chronic or recurrent burning sensation in the mouth, the most prevalent symptoms in diabetic patients are stomatodynia, stomatopyrosis, glossopyrosis, glossodynia, sore mouth, sore tongue and also oral dysesthesia. This affects the tongue, gum, lips, inside of your cheeks, roof of your mouth, widespread areas of your whole mouth. The drugs used for treatment are nortriptyline,oral and topical clonazepam, gabapentin, pregabalin and alpha lipoic acid [35].

Caviar tongue is the lingual varicosities is due to advancing age and affects the sublingual veins, the mucosal surface becomes thin and translucent [20]. The caviar lesion is the physiological change and causes senile elastotic degeneration of sublingual veins, even under surface of tongue along sublingual vein, in the floor of the mouth, on sublingual glands and along lateral portions of the tongue [47].

Oral psoriasis involves oral cavity with fissured tongue and also geographic tongue [31]. Oral psoriasis is the chronic dermatologic autoimmune disorder that affects both sexes. The reverse, pustular and vulgar psoriasis is seen in pustular psoriasis and also in geographic stomatitis. The diagnosis of oral psoriasis is done by histologic examination [10].

Changes In Periodontium

Periodontal disease has inflammatory nature and has a role in

pathogenesis. It is commonly seen in elderly, mostly above the age of 65 [12]. The susceptibility and severity of periodontal disease is very severe in diabetic patients [11]. Periodontal disease is actually divided into gingivitis and periodontitis, which are chronic infectious and inflammatory disease [8]. The individuals with periodontal diseases are at higher risk of coronal and root caries and influences irritation of carious cavities. The common risk factors such as poor oral hygiene for both caries and periodontitis and is different for different socioeconomic conditions [37] and the molar incisor hypomineralization gives the clear demarcation between the affected and sound enamel [30]. Gingival pigmentation is the colouration or discolouration of melanin pigment on gingiva. Most reported cause for gingival pigmentation is consumption of tobacco, amalgam tattoo, smoking and usage of antimalarial drugs [27].

Discussion

The description of the included studies is summarised in table 1. Most common oral lesion is considered as fibrous hyperplasia, stomatitis sub prosthesis seen in eduntulous patients that occurs between age 56 and 65 was observed by Abigail Figueroa, et al, 2020 [4]. CD 34 gene which is observed in submucosal fibroblasts that increase in collagen synthesis and is responsible for fibrous hyperplasia [29]. Oral mucosal lesion is caused by cotinine, the main nicotine metabolite in tobacco products and also causes Leukoplakia, erythroplakia and oral submucous fibrosis [34]. Common oral lesions are oral submucous fibrosis (21.33%), smoker's palate (20%), leukoplakia (14.66%), tobacco pouch keratosis (10.66%). The least commonly occurring lesion is frictional

Table 1. Description and quality of included studies.

S.No	Name of the Author	Year	Type of study	Sample size	Key points	Level of evidence
1	Ichiro Saito, et al., [28]	2020	Systematic review	-	Diabetes mellitus is the main cause of dry mouth syndrome.	Level 3
2	Naoyuki Matsumoto, et al [28]	2020	Systematic review	-	Sjogren's syndrome is mostly caused due to triggered autoimmune responses against exocrine glands.	Level 2
3	Shilpa S [41]	2020	Expert opinion	-	Sjogren's syndrome and its treatment.	Level 5
4	S Rohini, et al [36]	2020	Randomized controlled trial	75 patients	Oral mucosal lesion is due to wearing denture, prosthesis,etc.	Level 1
5	Tandi E Matsha, et al [34]	2020	Randomized controlled trial	1976 participants	Cotinine is one of the causes for oral mucosal lesions.	Level 1
6	Julia Stephanie Bruno, et al [7]	2020	Case series	1 patient	Development of persistent ulceration is explained.	Level 4
7	Renuka S, et al [35]	2020	Systematic review	-	Explanation of burning mouth syndrome and treatment for it is given.	Level 3
8	Felipe Paiva Fonseca, et al [10]	2020	Retrospective study	1 patient	Oral psoriasis is the chronic dermatologic autoimmune disorder that affects both sexes.	Level 3
9	Nurcan Buduneli [8]	2020	Expert opinion	-	Periodontal disease is actually divided into gingivitis and periodontitis, which are chronic infectious and inflammatory disease.	Level 5
10	Maria Gabriella Grusovin [12]	2019	Systematic review	-	Periodontal disease has inflammatory nature and has a role in pathogenesis in elderly.	Level 3
11	Dana T Graves, et al [11]	2019	Systematic review	-	The susceptibility and severity of periodontal disease is very severe in diabetic patients.	Level 3
12	WaelSabbah, et al [37]	2019	Retrospective study	4738 participants	Periodontal disease has a higher risk of coronal and root caries.	Level 1
13	AK Jha, et al [20]	2018	Case series	1 patient	Caviar tongue is the lingual varicosities is due to advancing age and affects the sublingual veins, the mucosal surface becomes thin and translucent.	Level 4
14	K Kaminska, et al [21]	2017	Case controlled study	240 patients	Thinning of epithelium leads to injury by protein deficiency.	Level 3
15	G Palaia, et al [31]	2017	Case series	1 patient	Oral psoriasis involves oral cavity with fissured tongue and also geographic tongue.	Level 4
16	K Blochowiak, et al [6]	2016	Randomized controlled study	55 patients	Dry mouth syndrome after age 65 and its causes.	Level 2
17	AG Tzioufas [44]	2015	Systematic review	-	Causes of Sjogren syndrome were discussed.	Level 3
18	M Bakshi, et al [3]	2015	Systematic review	-	Oral soft tissue change in oral mucosa and its tissue appearance.	Level 3
19	P Malik, et al [26]	2015	Systematic review	-	Tongue is a frequent site and its symptoms.	Level 3
20	FJ Silvestre, et al [43]	2015	Systematic review	-	Glossodynia and its impact.	Level 3
21	See SS, et al [39]	2013	Case series	1 patient	Oral cavity squamous cell carcinoma is observed 35% which is high in lymphatic spread.	Level 4
22	Seema Nair, et al [47]	2011	Retrospective study	1 patient	The caviar lesion is the physiological change and causes senile elastotic degeneration of sublingual veins.	Level 3
23	Langer A [24]	1976	Systematic review	-	Changes occur both in physical processes and metabolic processes and impaired cell regeneration due to progression of age.	Level 3
24	Cooke BE [9]	1971	Systematic review	-	Changes in oral mucosa are apparent after the age of 70, due to many metabolic disorders.	Level 3
25	Holm Pedersen P [17]	1971	Case controlled study	-	Oral mucosa and its keratinization and epithelium dependence.	Level 3

keratosis (1.33%) in non oral habits related lesions. The most common lesion was Aphthous ulcer (5.33%), geographic tongue (4%). The least common lesion is fissured tongue, traumatic ulcer of tongue (1.33%) was observed between 55 and 90 in Chennai [36]. Mucocele and pyogenic granuloma are the frequent oral lesions according to Gilberto De Souza Melo, et al, 2020 [5] is observed in individuals aging from 10 to 19 years of age. It is associated along with intraosseous lesions, odontogenic cysts, reactive lesions and salivary gland lesions. The reticular lichen planus is the most frequent oral lesion given by study of Valeria Souzafreitas, et al, 2020 [46] and the prevalence of oral lesion in type 2 diabetes mellitus has a higher frequency rate [25]. Application of saliva in the diagnosis is not only for salivary gland disorders but also for oral diseases and systemic conditions. So, saliva can be used as a diagnostic tool for oral lesions and carcinoma [42]. Berry's index is independent of oral soft tissue change, it is only for gender determination and facial reconstruction [1] and olze's method is for age estimation [32]. Tooth sensitivity is the condition that was specific once with geriatric patients but it is a common problem to all age groups [13]. The clinicians should know the clinical crown height for denture wear to avoid unnecessary oral lesions [16].

The limitations of the present review is that only recent studies have been included, the older studies were not included. The study populations of the previous researches are different, so the oral soft tissue changes would be different. The review should consider a wide range of studies with systemic diseases, non oral habit population and the study setting should be in a particular region.

Future scope of the present review article is by knowing these oral soft tissue changes, we can treat, give care to geriatric patients who are having oral soft tissue change. Its knowledge is always helpful for prosthodontists, for tumour management and the influence from systemic diseases may be known.

Conclusion

The influence and effect of oral soft tissue changes in the geriatric patients is well understood and the treatment and care can be given to them by this knowledge of review. These general guidelines can be used to exclude most oral soft tissue changes (oral lesions in particular) from clinical differential diagnosis, and guide the next step in management of a patient's problem. Final diagnosis requires additional testing like biopsy spectrum.

Author Contributions

Aldrin Joshua A: Literature search, data collection, analysis, manuscript writing.

GifrinaJayaraj: Data verification, manuscript drafting.

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