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Review Article

**THE SYSTEMATIC REVIEW OF ENDO-PERIO LESION AND
UNCONTROLLED DIABETES**¹Felwa Abdullah AlSaleem, ²Aljowhara Walid Alsadoon¹Department of Dentistry, Riyadh, Saudi Arabia.**Abstract:**

Diabetes mellitus has become a common disorder throughout the world at an alarming rate. The gingivitis and the gingival recession is more commonly seen in poly-control insulin dependent diabetes when compared to control insulin dependent diabetes. The chronic apical periodontitis and periodontal diseases are most commonly seen in people suffering with diabetes and is one of the most challenging aspect which is faced by the dental and the medical community. The periodontal diseases are found to a greater extent in patients with long duration Diabetics when compared to the short duration diabetes. The main aim of this study is to assess prior studies about the endo-perio lesions and its relationship with uncontrolled diabetes. Data was extracted from the online databases like Medline and PubMed Central, and tabulated using the predesigned data extraction forms. The total articles to be reviewed for the total research may be more than 739 articles for this study. This study showed the systematic review of literatures with a concise review of pertinent oral complications in patients with uncontrolled diabetes. Diabetes mellitus and Endo- perio lesions associated with each other according to the available evidence.

Keywords: *Diabetes mellitus, endo-perio lesions, gingivitis, gingival recession, apical periodontitis, periodontal diseases.*

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INTRODUCTION:

Diabetes mellitus is the metabolic disorder that is characterized by abnormality in carbohydrate, lipid and protein metabolism [1]. It occurs due to absolute deficiency of insulin target tissue and resistance to its cellular metabolic activities. Diabetes mellitus has become a common disorder throughout the world at an alarming rate [2].

Diabetes mellitus is commonly of two types Type 1 and type 2. Type 1 Diabetes occurs due to the Cellular mediated autoimmune destruction of pancreatic cells [3]. Type 2 diabetes occurs due to development of resistance to insulin [4]. Presently type 2 diabetes is the common form of diabetes in urban and rural populations.

Basically type 2 diabetes is associated with obesity that occurs due to the elevated levels of circulating free fatty that are derived from the adipose cells. The circulating free fatty acids inhibit the glucose uptake, synthesis of glycogen, and the process of glycolysis [6].

The uncontrolled Diabetes mellitus may lead to several oral complications like xerostomia, infection, poor healing, Candidiasis, caries severity, several periodontal diseases and burning mouth disorders [7]. Several epidemiological studies have been carried out to understand the association between the systemic health and the periodontal diseases [8].

The gingivitis and the gingival recession is more commonly seen in poly-control insulin dependent diabetes when compared to control insulin dependent diabetes. The increase in periodontal diseases in suffering from health occurs due to change host response, sub gingival micro flora, vascularity and collagen metabolism [9].

Periapical inflammatory disease show some resemblance with chronic periodontal diseases in terms of chronic infection within the oral cavity, being caused by Gram negative aerobic bacteria and enhanced cytokines levels [10].

The root canal system of the diabetic patients if is infected by the microbial bacteria as compared to the non-diabetic patients, the diabetic patients are more susceptible to different endodontic and periodontal diseases [11]. The periodontal diseases are found to a greater extent in patients with long duration Diabetics when compared to the short duration diabetes.

However there was same frequency seen in Diabetic and non-diabetic patients in terms of caries. The apical periodontitis with infection can be controlled

using the root canal treatment that has a high success rate [12]. However failure rate is increased in case of the diabetic patients compared to the non-diabetic patients.

RATIONALE BEHIND THIS STUDY:

The main reason to select this topic is to review the literature and better understand the endo-perio lesions and its relationship with uncontrolled diabetes that can help to increase the knowledge about the complications and also to fill in the gaps, found in the literature and to add some new updates about the increased frequency of endo-perio lesions in uncontrolled diabetic patients, its treatment and provide the guidelines to be carried out by the dental and the medical community as well as the patients to avoid the complications.

AIM & OBJECTIVES:

The main aim of this study is to assess prior studies about the endo-perio lesions and its relationship with uncontrolled diabetes. This can be attained by:

- Conducting a systematic review of studies to identify and categorize the different types of oral complications in the uncontrolled diabetic patients.
- Identifying the relation between the type of the diabetes and its effect on the occurrence of the endo-perio lesions in the oral cavity.
- Identifying the relationship between the Gender of the patient and the complication.
- Studying about various treatments opted to avoid and stop the endo-perio lesions in the uncontrolled diabetic patients.

METHODOLOGY:**Search design:**

To perform the systematic search using the Medline and PubMed Central in the English language with the aim to review the literature related to the endo-perio lesions and its relationship with uncontrolled diabetes. Data was extracted from the online databases like Medline and PubMed Central, and tabulated using the predesigned data extraction forms.

The predesigned data extraction form included the information about the study citation and characteristics (name of the Author/s, year of publication, country of study, and the age, gender and gender ratio of the reported endo-perio lesions in the uncontrolled diabetic patient's). It also included the

type of oral complication reported in the uncontrolled diabetic patients.

Extracted data from Medline and PubMed Central is to be entered in the predesigned data extraction form created by Principal Investigator. The outcome will be observed and the results will be recorded. Each article selected for the study will be closely reviewed and the data entered in the predesigned tables are evaluated and handled by the principal investigator.

Search terms used:

The search terms selected were in English language and were applicable to all types of oral complications of uncontrolled diabetic patients, like: “(endo-perio lesions AND uncontrolled diabetes)” OR “(perio-endo lesions AND uncontrolled diabetes)” OR “(uncontrolled diabetes AND endo-perio lesions)” OR “(Diabetes mellitus AND periodontitis)” OR “(Diabetes mellitus AND endodontic diseases)” OR “(periodontal diseases AND diabetes)” OR “(endodontic lesions AND diabetes)” OR “(non-insulin dependent diabetes” OR “type 1 diabetes” OR “t1dm” OR “type 2 diabetes” OR “t2dm” OR “niddm” OR “diabetic patient” OR “diabetic” AND “periodontitis” OR “oral lesions” OR “endodontitis” OR “gingivitis” OR “apical periodontitis” OR “oral infections” OR “endodontic infections” OR “periodontal infections”) AND (“therapy” OR “treatment” OR “intervention”). Apart from this, all the articles in the reference lists that were obtained via. The electronic media were manually searched to get more relevant articles. All the search of the literature articles were restricted to the English language.

Filters:

Initially no filters were applied to search, to make sure that all the previous studies are available for successive screening. Nevertheless, while applying the exclusion criteria, the filters were added to the Medline and PubMed Central, like: Human studies, studies in English language, adults of 18 years and old. These filters aids to ease the exclusion of the studies from the original list of literatures.

Inclusion and Exclusion Criteria:

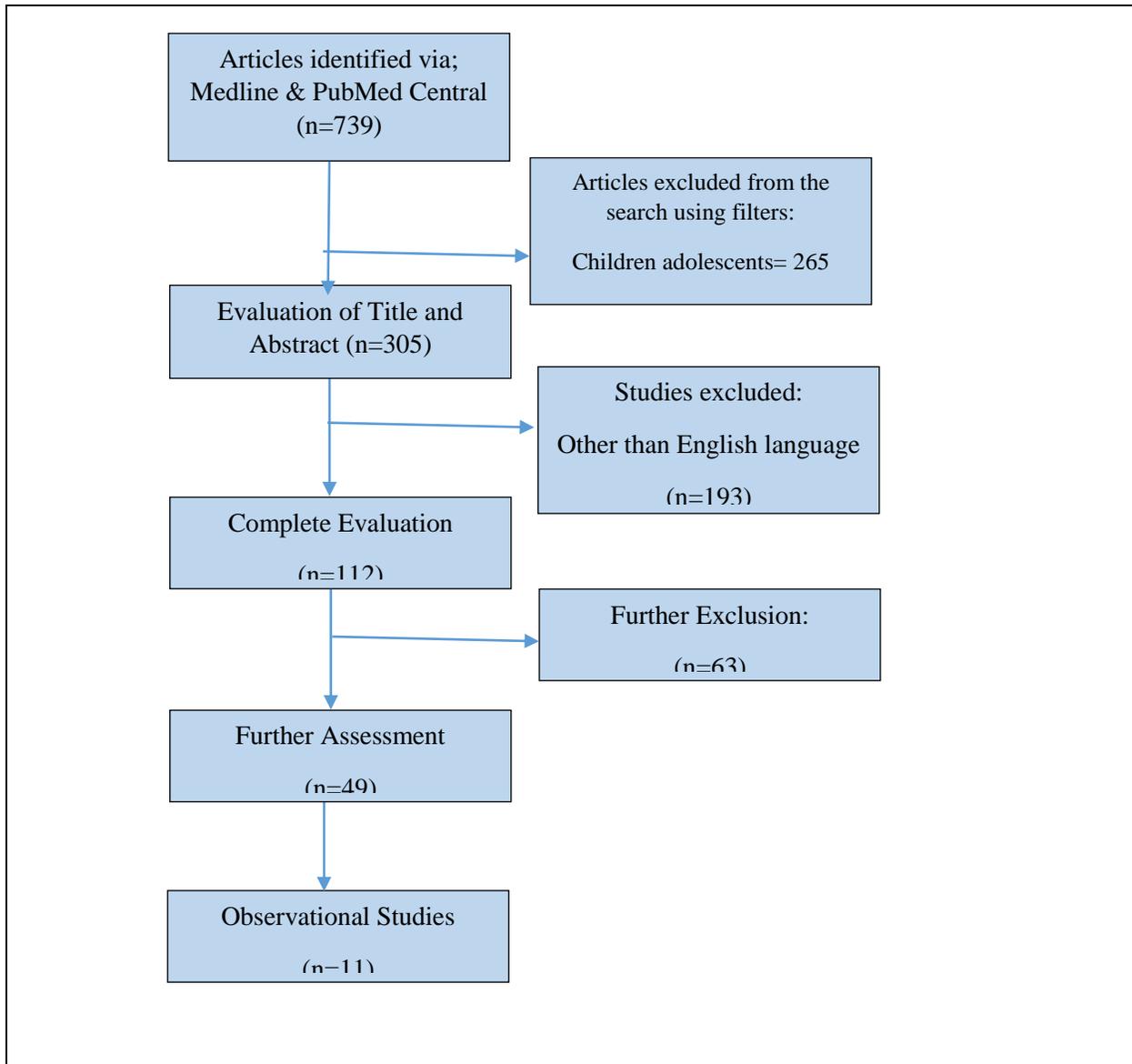
As stated earlier, the main aim of this study is to assess and review the previous studies about the endo-perio lesions and its relationship with uncontrolled diabetes. To attain this, the original list of articles or cases are to be screened to make them eligible for the study. The inclusion criteria of this study includes, all the articles or cases, that treated the endodontic and periodontal lesions in patients with uncontrolled diabetes; that treated both the genders (males and females); that considered only the oral complications associated with diabetic patients which are independent of complications of other body parts. The exclusion criteria of the study is to exclude, all the articles or cases, that are not in the English language; that treated the non-human subjects; that included the patients aged below 18 years of age; that have complications with regard to the other problems faced during the uncontrolled diabetes.

TIME LINE OF STUDY:

The time line for the research may be about 6 months to collect the data, analyze it, write the manuscript, and review the manuscript.

NUMBER OF ARTICLES TO BE REVIEWED:

The total articles to be reviewed for the total research may be more than 739 articles for this study.



Flow Chart Showing the systematic review after applying the inclusion and exclusion criteria

Research has found that about total 739 articles related to our search terms. By applying the filters and limiting the articles with human studies, adult studies and English language studies, about 112 were sorted to study. The abstracts and titles were studied and by applying the inclusion and exclusion criteria, about 49 articles were selected and from this upon further assessment 38 articles were removed and only 11 articles were included in the study of the systematic review of literature about the endo-perio lesions and its relationship with uncontrolled diabetes.

<i>AUTHOR</i>	<i>PERIOD OF DATA COLLECTION</i>	<i>COUNTRY OF STUDY</i>	<i>DATA SOURCE</i>	<i>SAMPLE SIZE</i>	<i>DIABETES TYPE</i>	<i>AGE OF THE PATIENT</i>	<i>COMPLICATIONS REPORTED</i>
<i>Emrick et al.</i>	1990	New York	Journal of periodontology	254	T1 + T2	>35 years	Alveolar bone loss, gingival bleeding, decayed teeth, sub gingival calculus.
<i>Seppala B et al.</i>	1994	Helsinki	J Clin Periodontol	38	IDDM	>35 years	Plaque, bleeding, lesions, loss of alveolar bone.
<i>Collin et al.</i>	1998	Finland	Diabetes Care	25	NIDDM	>50 years	Deep pockets, endodontic lesions, gingivitis, obesity, NIDDM
<i>Cutler et al.</i>	1999	United states of America	Journal of periodontology	36	T2	>25 years	Periodontal pockets with bleeding, poorly controlled diabetes
<i>Moore PA et al.</i>	1999	Pittsburgh	J periodontal	320	T1	>25 years	Soft tissue pathologies, coronal and root caries, calculus, bleeding.
<i>Stewart et al.</i>	2001	Los Angeles	. J Clin Periodontol	36	T2	>18 years	Periapical radiolucency's and sufficient periodontal destruction, diabetic
<i>Tsai C et al.</i>	2002	United states of America	Community Dent Oral Epidemiology.	4343	T2	>45 years	Severe periodontitis with probing pocket depth.
<i>Kiran et al.</i>	2005	Turkey	J Clin Periodontol	22	T2	>40 years	Oral lesions, diabetic, infection
<i>Mealey BL, Oates TW</i>	2006	United states of America	Journal of Periodontology	200	T2	>18 years	Gingival inflammation, progressive alveolar bone loss, periodontitis, diabetic nephropathy.
<i>Shultis et al.</i>	2015	United states of America	European Federation of Periodontology	529	T2	>25 years	Periodontal diseases, edentulism, greater bone loss, diabetic nephropathy.
<i>Katagiri et al</i>	2017	Japan	Diabetes care	32	T1 +T2	>50 years	Oral periodontal pockets, periodontitis, root canal treatment done, diabetic

The systematic review of literature related to the endo-perio lesions and its relationship with uncontrolled diabetes from the 11 selected articles showed study from a period of 1990 to 2017. In Most of the studies the mean age of the patient was around 33 years. All the studies included males and females.

These studies reported many oral complications in uncontrolled diabetes.

DISCUSSION:

The main aim of this study was to draw the medical

and dental community's attention to the oral complications in uncontrolled diabetes. This study showed the systematic review of literatures with a concise review of pertinent oral complications in patients with uncontrolled diabetes.

The present studies reported cases with the endo-perio lesions and its relationship with uncontrolled diabetes. There have been many studies about the reports concerning the oral complications of uncontrolled diabetes and its management.

In order to increase the comprehension and interpretation of the findings we selected only those articles that is published in English language. Diabetes mellitus and Endo- perio lesions associated with each other according to the available evidence.

The susceptibility of getting Endo perio diseases is more in the diabetic patients when compared to the non-diabetic patients. However the patients with control diabetes doesn't show any increase in extent and severity of periodontic lesions as seen in uncontrolled diabetes.

Uncontrolled diabetes can be considered as a risk factor for the enhancement of severity of Endo perio lesions. The uncontrolled diabetes can complicate the Endo perio lesions when compared to the controlled diabetic patient.

CONCLUSION:

On the basis of the results from this systematic review study and the previous studies it can be seen that the endo-perio lesions severity increases in case of uncontrolled diabetes. Comparatively less or no impact is seen in increase in severity of the endo-perio lesions in case of the controlled diabetic patients.

It is found that it is a matter of urgency for both the dental and the medical community as diabetes is increasing throughout the world at an alarming rate that make further increase in chances of occurrence and the severity of Endo perio lesions in case of uncontrolled diabetic patients. Thus future research need to be done on this topic to reduce the severity of Endo perio lesions in case of uncontrolled diabetic patients and find a solution to this problem.

ETHICAL CONSIDERATIONS:

Compliance with ethical standards

Ethical approval: This proposal does not contain any studies with human participants performed by any of the authors.

Conflict of interest: The authors do not have any commercial associations that might pose or create a conflict of interest with information presented in this communication. No intramural or extramural funding supported any aspect of this work

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