



REVIEW ARTICLE

RUSSELL'S PERIODONTAL INDEX: TO SCORE OR NOT TO SCORE

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ABSTRACT

It is a composite index, which grades all pockets. Some consider it no longer valid. It was the first index for periodontal disease with a weighted categorial system. The diagnostic criteria for the periodontal index developed by Russell are based on gingival inflammation & loss of periodontal attachment. This index has been used mainly for epidemiological & purposes, & a variety of different populations in developing countries have been examined using this index. It measures both reversible & irreversible aspects of periodontal disease. It is an epidemiologic index with a true biological quotient. This paper puts forth the version of this index. Russells index is a numerical value describing the population on a level with a definite upper & lower level.

INTRODUCTION

Numerous epidemiological studies show that diseases of the periodontium are among the most common afflictions of mankind. The predominant ones are gingivitis & periodontitis caused by bacterial plaque. The prevalence & severity of periodontal diseases have been reported for different age groups & all populations all over the world, several reviews of it have been presented (Loe, 1963; Scherp, 1964; Waerhaug, 1966). In general, gingivitis is commonly found in the first & permanent in children & affects the primary & permanent in children & affects the most adults. Although clinical attachment loss (CAL) is rarely found in children, the periodontium, the alveolar bone loss increasing in teenagers. After the age of 20, periodontal destruction will in most cases result in extensive periodontal destruction, the main cause of tooth loss in adults (Waerhaug, 1966; Johansen, 1970). Indices are numerical values describing the relative status of the population on a graduated scale with definite upper & lower limits, which are designed to permit & facilitate comparisons with other populations & are classified by the same criteria & methods. According to Russell it is a numerical value describing the population on a level with a definite upper & lower level.

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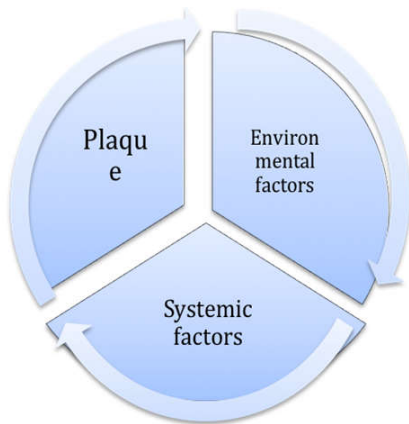
By using indices, which have been carefully defined, comparisons can be made between different population groups of the severity of a disease since the same criteria & is both reliable & has validity (Russell, 1956; Chapters, ?).

Indices (Russell, 1956) are numerical values describing the relative status of the population on a graduated scale with definite upper & lower limits, which are designed to permit & facilitate comparisons with other populations & are classified by the same criteria & methods. Indices can be classified into four different categories

- Gingival index
- Periodontal indices
- Oral hygiene indices
- Miscellaneous- retention index, alveolar bone loss & mobility index (Russell et al)

History (Russell, 1956): The Russell periodontal Index (RPI) was developed for epidemiological purposes & assumes a progression of gingivitis to pocket formation leading to advanced destruction with loss of masticatory functions with age. Periodontal indices conducted during this century attempting to assess periodontal disease was either characterized as present or absent or described according to the tissue condition, good, fair or poor. During the late 1950's & early 1960's, the WHO supported a series for theses studies to evaluate both these studies to evaluated both gingival inflammation & periodontal destruction. This index measured gingival inflammation, pocket formation & loss of masticatory

function & loss of masticatory function according to the following criteria. It is a composite index, which grades all pockets. Some consider it no longer valid. It was the first index to be developed for periodontal disease with a weighted categorical system.



The diagnostic criteria for the periodontal index developed by Russell are based on gingival inflammation & loss of periodontal attachment. This index has been used mainly for epidemiological & purposes, & a variety of different populations in developing countries have been examined using this index. It measures both reversible & irreversible aspects of periodontal disease. It is an epidemiologic index with a true biological quotient. A classic epidemiological approach to a disease of unknown etiological factors involvement.

Scoring (Prevention of oral & dental diseases, 2002): Scoring intervals have been proposed in a linear correlation between periodontal disease & aging. Scoring for each tooth is carried out & the scores are totaled and divided by the fractures of teeth present to obtain the average gingival index. (Table 1, 2, 3), (Diagrammatic 1)

Uses (Wei, 1981)

- Epidemiological studies
- Most useful when it is necessary to distinguish between population with mild, moderate & advanced chronic destructive disease

Modifications

- For the epidemiological surveys of large populations six index teeth are used instead of all teeth present in the mouth

Advantages (Russell, 1960):

- Easy & quickly learned & is reproducible
- Index is simple enough to be practicable under a wide variety of field conditions
- This index measures both reversible & irreversible aspects of periodontal disease; hence it is known as epidemiological index with significance.

Table 1. Scoring

0	Negative There is neither overt inflammation in the investing tissues nor loss of function due to destruction of supporting tissue
1	Mild gingivitis. There is an overt area of inflammation in the free gingiva which does not circumscribe the tooth
2	Gingivitis. Inflammation completely circumscribes the tooth, but there is no apparent break in epithelial attachment
6	Gingivitis with pocket formation. The epithelial attachment has been broken & there is a pocket (not merely a deepened gingival crevice due to swelling in the free gingivae) There is no interference with normal masticatory function, the tooth is firm in its socket, & has not drifted
8	Advanced destruction with loss of masticatory function. The tooth may be loose, may have drifted, may sound dull on percussion with a metallic instrument, may be depressible in its socket

Table 2. Scoring

Score	ADDITIONAL/RADIOGRAPHIC OBSERVATION
0	Essentially normal
1	Essentially normal
2	Essentially normal
4	Irregular early notch like resorption only if the alveolar crest is present
6	There is horizontal bone loss involving the entire alveolar crest. The bone loss is not more than half of the total anatomical root length
8	There is severe bone loss involving infra bony & widening (thickening) of PDL. There may be rarefaction at the root apex or Resorption of root

Table 3. Teeth scored

Y	2	1	0	1	1	0	2	2	2	2	0	2	1	0	0	1
	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
X1	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
	2	1	0	2	1	0	3	3	3	3	0	1	2	0	0	2

1-nos of teeth in new FDI notation system; y-score if teeth; total no of teeth examined-32; Russells p.i- 40/32=1.25

Table 4. Interpretation

RPI SCORE	CLINICAL CONDITIONS	STAGES OF DISEASE
0-0.2	Clinically normal periodontal tissues	Within normal limit
0.3-0.9	Simple marginal gingivitis	Reversible
1-1.9	Beginning of destructive periodontal disease	Reversible
2-6	Established destructive periodontal disease	Reversible with modern treatment
6.1-8	Established destructive terminal periodontal disease	Irreversible

- Significance of periodontal index is that more data has been assembled using this index than any other index of periodontal index
- The application & uses of Russells periodontal index in the past have led to the development of better understanding of periodontal health status including research in the present area
- Criteria are clear most of the time in epidemiological studies, results obtained are comparable

Geographical variation in prevalence of gingival & periodontal diseases (Russell, 1960): Russell & coworkers demonstrated that wide variations in periodontal that wide variations in periodontal disease in a given age-group exists across the world.

Limitations (Textbook of preventive & community dentistry; Douglass, 1993):

- In field surveys radiographic are not practicable & hence sore 4 cannot be used
- Index scores from 2 onwards jump to 4, 6, 8 only to signify the severity & nature of destruction of periodontium, which are not recordable, & most of them are reversible
- Most time consuming
- This index is not sensitive to minor changes in periodontium
- No standardised probes are used
- It does not give past periodontal experience

Critical evaluation (Shaju Jacob, 2011; Douglass, 1993): Epidemiological surveys of populations including NHANES 1 but became outdated because of the following reasons

- Gingivitis is not early periodontitis
- Probing pocket depth (PPD), CAL & radiographic bone loss was considered
- Subjectively there is no clear distinction between gingivitis & periodontitis
- Unwarranted weights are assigned to different categories of disease.

Future periodontal indices-a prospective view: The prevalence of periodontitis has historically been the extent & severity of loss of CAL and or PPD in mms, & represents an accretion of the manifestations of past disease with little/no indication of present disease activity, a dependable method of quantifying periodontal disease incidence is essential. Radiographic bone levels are closely related to CAL, which is the gold standard for scoring periodontitis & useful for scoring periodontitis

Summary and Conclusion: The need for a valuable periodontal index made an introduction of several periodontal indices. The introduction of the RPI made a few jumpstart on these indices. Presently PPD & CAL is advocated as a definition of periodontal disease. This index considers based on gingival inflammation & loss of periodontal attachment. This index has been used mainly for epidemiological & purposes. Weighing out the pros & cons, this index one needs to decide which index to score & not to score.

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