A periodontal risk assessment protocol

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A periodontal risk assessment protocol

Female, 34 years

2006

2009
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Mean annual attachment loss rate in untreated subjects

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Mean annual attachment loss rate in untreated subjects

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Annual Attachment Loss Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>No progression</td>
<td>0.06 (0.04 – 0.09) mm/year</td>
</tr>
<tr>
<td>Moderate progression</td>
<td>0.18 (0.05 – 0.52) mm/year</td>
</tr>
<tr>
<td>Rapid progression</td>
<td>0.65 (0.13 – 1.04) mm/year</td>
</tr>
</tbody>
</table>

A periodontal risk assessment protocol

600 patients undergone periodontal treatment at least 15 years previously
(age range: 12-73 years; mean duration of supportive periodontal therapy: 22 years)

Retrospective identification of teeth with a questionable prognosis

marked mobility + deep pockets
furcation involvement
deep non-eradicable pocket
extensive bone loss

Patient grouping according to the n° of teeth lost during SPT

<table>
<thead>
<tr>
<th>Well maintained</th>
<th>Downhill</th>
<th>Extreme downhill</th>
</tr>
</thead>
<tbody>
<tr>
<td>(499 patients)</td>
<td>(76 patients)</td>
<td>(25 patients)</td>
</tr>
<tr>
<td>(0-3 teeth lost)</td>
<td>(4 to 9 teeth lost)</td>
<td>(10 to 23 teeth lost)</td>
</tr>
<tr>
<td>n° questionable teeth initially present</td>
<td>1592</td>
<td>385</td>
</tr>
<tr>
<td>n° lost teeth</td>
<td>342</td>
<td>435</td>
</tr>
<tr>
<td>Distribution (%) of lost teeth according to initial prognosis</td>
<td>questionable</td>
<td>favourable</td>
</tr>
<tr>
<td></td>
<td>79.5</td>
<td>20.5</td>
</tr>
</tbody>
</table>

Hirschfeld L, Wasserman B.
A long-term survey of tooth loss in 600 treated periodontal patients.
A periodontal risk assessment protocol

600 patients undergone periodontal treatment at least 15 years previously
(age range: 12-73 years; mean duration of supportive periodontal therapy: 22 years)

Retrospective identification of teeth with a questionable prognosis

marked mobility + deep pockets
furcation involvement
deep non-eradicable pocket
extensive bone loss

Patient grouping according to the n° of teeth lost during SPT

Well maintained (499 patients)
(0-3 teeth lost)

- MAINTAINED: 35.3%

Downhill (76 patients)
(4 to 9 teeth lost)

- MAINTAINED: 11.6%

Extreme downhill (25 patients)
(10 to 23 teeth lost)

- MAINTAINED: 11.6%

n° questionable teeth initially present

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<td>1592</td>
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How could we anticipate the rate of periodontal disease progression (prognosis)?
American Academy of Periodontology
statement on risk assessment

Utilizing risk assessment helps dental professionals predict the potential for developing periodontal diseases and allows them to focus on early identification and to provide proactive, targeted treatment for patients who are at risk for progressive/aggressive diseases.

The AAP believes the clinical use of risk assessment will become a component of all comprehensive dental and periodontal evaluations as well as part of all periodic dental and periodontal examinations.
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Clinical history

Clinical condition

Risk assessment

Patient #1

Patient #2

WORSE PROGNOSIS
MORE THERAPY
WORSE RESPONSE TO THERAPY

BETTER PROGNOSIS
LESS THERAPY
BETTER RESPONSE TO THERAPY

Page RC, Martin JA, Loeb CF.
Use of risk assessment in attaining and maintaining oral health.
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### Risk factor

Environmental or individual characteristic which directly increases (when present) or decreases (when absent) the probability of a subject to be affected by a disease.

*Beck 1994*

<table>
<thead>
<tr>
<th>true</th>
<th>putative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific bacterial species</td>
<td>Gene polymorphisms</td>
</tr>
<tr>
<td>Smoke</td>
<td>Age</td>
</tr>
<tr>
<td>Diabetes (insufficient metabolic control)</td>
<td>Socio-economic status</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Psycho-social factors</td>
<td></td>
</tr>
<tr>
<td>Osteoporosis/osteopenia</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td></td>
</tr>
</tbody>
</table>

### Risk indicator

Factor which may predict the progression of a disease, either spontaneous or under treatment.

*Papapanou 2005*

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Bleeding on probing</td>
<td>Presence of periodontal pathogens</td>
</tr>
<tr>
<td>Number of periodontal pockets</td>
<td>Bone loss / age ratio</td>
</tr>
<tr>
<td></td>
<td>Gingival crevicular fluid components</td>
</tr>
</tbody>
</table>

*Tonetti & Claffey 2005*

*Heitz-Mayfield et al. 2005*
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The use of objective methods for risk assessment improves the accuracy of risk evaluation

- **BoP%**
- **PPD>6mm**
- **tooth loss**
- **prop. bone loss**
- **smoking**
- **bone loss/age**
- **env./Smok.**
- **syst./Genet.**

**PPRD**
Renvert et al. 2004

**BoP**

**PPD>4mm**

**tooth loss**

**UniFe**
Farina et al. 2007
Trombelli et al. 2009

The use of objective methods for risk assessment improves the accuracy of risk evaluation.
record charts of
523 patients aged 25 to 74 years
(101 smokers, 9 diabetics)

with different periodontal status

follow-up: 15 years

% of patients undergone 1 or no periodontal treatment through the follow-up period: ≥80%
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- Validity of Periodontal Assessment Tool® (PAT®) in predicting periodontal disease -

Mean bone loss for patients assigned a PAT® risk score 2-5

Mean tooth loss for patients assigned a PAT® risk score 2-5

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- Risk assessment according to the UniFe method -

**UniFe** (unife.it/parodontologia)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter score</th>
<th>Smoking status (n° cig/day)</th>
<th>Diabetic status (serum HbA1c)</th>
<th>n° of pockets with PPD≥ 5mm</th>
<th>BoP score (%)</th>
<th>Bone loss/age ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0-4</td>
<td>0-4</td>
<td>0-4</td>
<td>0-4</td>
<td>0-8</td>
</tr>
</tbody>
</table>

- Sum: 0-2 risk score 1
- Sum: 3-5 risk score 2
- Sum: 6-8 risk score 3
- Sum: 9-14 risk score 4
- Sum: 15-24 risk score 5

- Low Risk
- Medium-Low Risk
- Medium Risk
- Medium-High Risk
- High Risk

Trombelli L, Farina R, Ferrari S, Pasetti P, Calura G
Comparison between two methods for periodontal risk assessment.
*Minerva Stomatologica* 2009;58:277-287
A periodontal risk assessment protocol

- Agreement between UniFe and PAT® methods -

107 patients
(34 ♂, 73 ♀; mean age: 45.5 ± 9.9 years)

Distribution of patients according to UniFe risk scores

Distribution of patients according to PAT® risk scores

Trombelli L, Farina R, Ferrari S, Pasetti P, Calura G.
Comparison between two methods for periodontal risk assessment.
A periodontal risk assessment protocol

- Agreement between UniFe and PAT® methods -

<table>
<thead>
<tr>
<th>DIFF (risk score_{UniFe} – risk score_{PAT®})</th>
<th>n° patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td>1 (0.9%)</td>
</tr>
<tr>
<td>+1</td>
<td>12 (11.2%)</td>
</tr>
<tr>
<td>0</td>
<td>80 (74.8%)</td>
</tr>
<tr>
<td>-1</td>
<td>10 (9.3%)</td>
</tr>
<tr>
<td>-2</td>
<td>4 (3.7%)</td>
</tr>
</tbody>
</table>

\[ k_{(\text{Landis & Koch 1977})} = 0.70 \]
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Gender: ♀
Age: 45 years
Never smoked
Diabetic (type 2, non-controlled)
Genotype: heterozygote
(\text{IL-1}{}_{\alpha}{}^{+4845}, \text{IL-1}{}_{\beta}{}^{-511}, \text{IL-1}{}_{\beta}{}^{+3953})

Diagnosis:
Generalized Aggressive Periodontitis
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Risk assessment BEFORE initial therapy

<table>
<thead>
<tr>
<th>Fattore indicatore di rischio</th>
<th>Punteggio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fumo</td>
<td>0 punti</td>
</tr>
<tr>
<td>Diabete</td>
<td>0 punti</td>
</tr>
<tr>
<td>Numero di tasche ≥ 5 mm</td>
<td>0 punti</td>
</tr>
<tr>
<td>Infiammazione gengivale</td>
<td>0 punti</td>
</tr>
<tr>
<td>(Indice di sanguinamento al sondaggio)</td>
<td>0 punti</td>
</tr>
<tr>
<td>Rapporto perdita ossea/eta</td>
<td>0 punti</td>
</tr>
</tbody>
</table>

Punteggio totale

- punteggio totale: 16 punti

- rischio: elevato
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Risk assessment AFTER initial therapy

Fattore indicatore di rischio
- Fumo
  - 0 punti
  - 1 punto
  - 2 punti
  - 3 punti
  - 4 punti
- Diabete
  - 0 punti
  - 2 punti
- Numero di tasche ≥ 5 mm
  - 0 punti
  - 1 punto
  - 2 punti
  - 3 punti
  - 4 punti
- Infiammazione gengivale
  (Indice di sanguinamento al sondaggio)
  - 0 punti
  - 1 punto
  - 2 punti
  - 3 punti
  - 4 punti
- Rapporto perdita ossea/età
  - 0 punti
  - 2 punti
  - 4 punti
  - 6 punti
  - 8 punti

Punteggio totale 7 punti

punteggio totale
- 0 - 2
- 3 - 5
- 6 - 8
- 9 - 14
- 15 - 24

rischio basso
rischio medio-basso
rischio medio
rischio medio-elevato
rischio elevato
Retrospective evaluation of a cohort of 160 periodontitis patients

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LOW RISK (6.9%, n=11)
- Fully compliant with SPT: 100%
- Not compliant with SPT: 15.5%

MODERATE RISK (56.2%, n=90)
- Fully compliant with SPT: 84.5%
- Not compliant with SPT: 15.5%

HIGH RISK (36.9%, n=59)
- Fully compliant with SPT: 42.5%
- Not compliant with SPT: 47.5%

Number of teeth lost
- LOW RISK: 1.18 ± 1.89
- MODERATE RISK: 0.80 ± 1.25
- HIGH RISK: 2.21 ± 3.21

Re-evaluation after 4 years of supportive periodontal therapy
General conclusions, clinical implications

Periodontal risk assessment may help clinicians to identify subjects with an impaired periodontal prognosis as well as determine the impact of treatment on periodontal prognosis;

Preliminary data from retrospective studies seem to indicate that UniFe method represents a simplified and reliable tool for periodontal risk assessment;

Longitudinal studies where patients with different periodontal status are long-term evaluated are needed to validate the current methods for periodontal risk assessment.
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Mattia Pramstraller, DDS
Alessandro Rizzi, DDS
Alessandro Scabbia, DDS
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Leonardo Trombelli, DDS PhD

Thank you for your attention

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