Microbial and Genetic Testing in the Treatment of Periodontal Disease

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Periodontal Disease
A bacterial infection in a susceptible host
- Genetic Testing
  - PST Test
- Microbial Analysis
  - Culture & Sensitivity
  - Molecular Microbiology
  - Enzyme Analysis

PST Genetic Test
- Simple Swab from buccal mucosa
- Measures production of:
  - Pro-inflammatory Interleukin-1 (IL-1)
  - Anti-inflammatory Interleukin-1 receptor antagonist (IL-1-RN)
Categorise Patient into one of four groups:

- Both IL-1 and IL-1-RN production normal
- IL-1 normal, IL-1-RN ↓
- IL-1 ↑, IL-1-RN normal
- IL-1 ↑, IL-1-RN ↓
- Risk increased further for smokers

Indications for Testing
(As recommended by Interleukin Genetics)

- New periodontal patients to assist in developing treatment plans
- Patients requiring extensive periodontal and/or implant therapy to determine prognosis, improve patient acceptance and optimise treatment outcomes
- Smoking patients as an additional incentive for smoking cessation
- Maintenance patients to set recall intervals and improve compliance
- Patients with early signs of disease to help determine the need for referral to a specialist
Patients who have periodontal disease are known to be susceptible!

Future Study...

The University of Michigan is examining 15 years of patient clinical outcome data from an insurance company and will then recruit 4000 of those patients and establish their PST status. They will combine this genetic information with two other risk factors (Smoking & Diabetes) and measure tooth survival rates.

Microbial Analysis

- Culture & Sensitivity
  - Needs to be a local perio aware service
  - Transport & Timing Difficulties
  - Culturing Difficulties
  - Mixed infection
  - Other colonising organisms
  - Commercial service only in USA
  - Less accurate than other methods

Microbial Analysis

- Molecular Microbiology
  - Technically simple sampling
  - Results in ~8 weeks from USA
  - Interpretation often demanding
Select 5 sites (Pooled analysis)
- >5mm with BOP (not suppurating)
- Clear gingival margin of plaque
- Insert paper point to base of pocket
- Hold in place for 10 seconds
- Guide with probe if necessary
- Place paper points in vial
- Complete lab form and mail
- Results in ≈ 3 weeks

Do not sample patients who:
- Have had antibiotics in last 4-5 weeks
- Have had debridement in last 4-5 weeks
- Have used mouthrinse in last 12 hours
Microbiological analysis for patient Alison Paton resulted in a bacterial concentration requiring periodontal treatment due to the following complexes: Red Complex (Tf,Td). Depending on the severity of clinical findings, anti-infective measures should include periodontal debridement (SRP) and may include topical antiseptics, topical or systemic antibiotics. An adjunctive antibiotic administration (scenario 2, metronidazole: 2 x 500 mg/day, 8 days) may also be considered based upon clinical findings and patient’s medical history. For evaluating therapy success a control analysis is recommended approx. 8 weeks after treatment.

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Alison Paton
01/05/1965
Multi-site sample
08/19/2009
Initial analysis
ANA343501
09/03/2009
3dp / 6d / 8m / 18d / 31d
3dp / 6d / 8m / 18d / 31d
10+mm
Non-smoker.
As stated on the order form, no antibiotic hypersensitivities are known. Please note that the clarification of potential antibiotic hypersensitivities is mandatory prior to any antibiotic intake.

Enzyme Analysis
- Technically simple sampling
- Results in 5-10 minutes
- Equipment USA only
- Red Complex Species Only
  - Porphyromonas gingivalis
  - Tannerella forsythia
  - Treponema denticola

Enzymic Microbial Analysis
Of 60 subgingival plaque species tested only those in the Red complex possess an enzyme capable of hydrolyzing benzoyl-DL-arginine-naphthylamide (BANA). This produces B-naphthylamide which then reacts with a diazo dye to produce a blue colour.

The result for those three species is as accurate as using molecular techniques and more accurate than culturing.
