Use of Ayurveda in Periodontics - Recent Advances

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Abstract—Ayurvedic phytotherapy and formulation-based approaches are increasingly explored as adjuncts to conventional periodontal therapy. Recent clinical trials and systematic reviews report promising antimicrobial, anti-inflammatory and antioxidant benefits from agents such as Curcuma longa (curcumin), Triphala, Azadirachta indica (neem) and other herbal extracts — often delivered as mouthwashes, gels or local drug-delivery (LDD) chips — and evaluated using standard periodontal indices (PI, GI, PPD, CAL, BOP). This article summarizes recent advances, mechanisms, clinical outcomes, limitations of current evidence, and future directions.

Index Terms—Ayurveda, periodontics, curcumin, Triphala, neem, herbal formulations, local drug delivery.

I. Introduction

Periodontal disease is a chronic inflammatory condition driven by dysbiotic biofilms and host immune response. Increasing antimicrobial resistance, side effects of chemical agents (e.g., staining and taste alteration from chlorhexidine), and patient demand for "natural" therapies have stimulated research into Ayurvedic botanicals as adjuncts to scaling and root planing (SRP) and other non-surgical periodontal procedures [3,11].

II. Recent Advances

1. Curcumin (Curcuma longa) — Locally delivered curcumin (gels, chips, irrigants) as an adjunct to SRP produces additional improvement in probing pocket depth (PPD) and clinical attachment level (CAL) compared with SRP alone [4,5].

2. Triphala — Triphala mouthwash has been compared with chlorhexidine; studies report comparable reductions in gingival inflammation and bleeding, with fewer side effects [6,9].

3. Neem (Azadirachta indica) — Neem gels and chips used as local drug delivery systems show significant reductions in PPD, PI and GI when used with SRP [7].

4. Other botanicals — Aloe vera, green tea, pomegranate, miswak and polyherbal formulations demonstrate reductions in plaque index and gingival index, often delivered via controlled-release gels and chips [8].

III. Mechanisms

- Antimicrobial: inhibition of periodontal pathogens and reduction of biofilm [3].

- Anti-inflammatory: curcumin and polyphenols modulate NF-κB and cytokine signaling [4].

- Antioxidant: scavenging of reactive oxygen species and promotion of healing [8].

IV. Indices Used in Ayurvedic Periodontal Research

1. Plaque Index (PI, Silness & Löe) [1] — plaque thickness at the gingival margin.

2. Gingival Index (GI, Löe & Silness) [2] — gingival inflammation score.

3. Probing Pocket Depth (PPD) [4] — distance from gingival margin to pocket base.

4. Clinical Attachment Level (CAL) [4] — distance from CEJ to pocket base.

5. Bleeding on Probing (BOP) [3] — bleeding after probing.

V. Clinical Evidence Summary

- Curcumin gels and chips: significant adjunctive improvements in PPD and CAL [4,5].

- Triphala mouthwash: effective for gingivitis, comparable to chlorhexidine [6,9].

- Neem chips: effective local adjunct with microbiological benefits [7].

- Herbal LDD: promising but requires standardization [8].

VI. Limitations

Small sample sizes, heterogeneity in formulations, and short follow-up limit generalizability [3,4]. Long-term multicenter RCTs are needed.

VII. Conclusion

Ayurvedic botanicals — particularly curcumin, Triphala and neem — show promising adjunctive effects in non-surgical periodontal therapy, with improvements in standard indices (PI, GI, PPD, CAL, BOP). While current evidence is encouraging, larger standardized trials are needed before routine recommendation.

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