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EFFECTIVENESS OF LOCAL IMMUNOMODULATORY THERAPY IN PATIENTS WITH CHRONIC PERIODONTITIS AND LEUKEMIA: A CLINICAL AND LABORATORY STUDY

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Abstract

Chronic leukemia significantly worsens periodontal disease outcomes, leading to higher rates of severe periodontitis and poor response to standard treatments. This study evaluated a novel adjunctive local immunomodulatory therapy in 62 patients with chronic leukemia and periodontitis (main group) compared to 63 similar patients receiving standard care alone (comparison group). All patients underwent baseline clinical assessment (periodontal indices, probing depth, bleeding) and laboratory evaluation (salivary IgA, IgM, IgG, lysozyme). The main group received a 14-day course of a local immunomodulator (**Ventero-Nova**) applied to the gingiva alongside conventional scaling and antiseptics, while the comparison group received only standard therapy. **Results:** At baseline, leukemia patients exhibited pervasive periodontal inflammation and immune dysfunction: mean Papillary-Marginal-Alveolar (PMA) inflammation index ~85% vs 21% in controls, with bleeding on probing ~70% vs 18%. Salivary immune factors were significantly reduced: IgA ~35% below normal (128 vs 197 µg/mL) and lysozyme ~45% below normal (0.73 vs 1.31 U/mL, $p<0.001$). Standard therapy alone provided only transient improvement, with literature indicating up to 60% recurrence of inflammation by 3 months and persistent deep pockets in leukemia patients. In contrast, the adjunctive immunotherapy group achieved significantly better outcomes. By 90 days, the main group showed a 44.1±5.2% reduction in PMA index, a mean probing depth decrease of 1.6±0.3 mm, and an average reduction in total subgingival microbial load by 2.5 $\log_{10}$ CFU/mL relative to baseline, all significantly greater improvements than in the comparison group ($p<0.001$). Salivary IgA levels in the main group rose from 128 to 177 µg/mL (~90% of healthy level), and lysozyme normalized (0.72 to 1.20 U/mL) by day 90. Concurrently, 71% of main-group patients achieved complete elimination of **P. gingivalis** from periodontal pockets. The comparison group, lacking immunotherapy, showed minimal immune improvement and more frequent disease relapse (persistent

bleeding, recurrent deep pockets). No adverse effects of the immunomodulator were observed. **Conclusions:** Integrating local immunomodulatory therapy significantly enhanced clinical and immunological outcomes in leukemia patients with periodontitis. The approach restored mucosal immunity (IgA, lysozyme) and improved infection control, yielding a stable remission of periodontal disease. These findings underscore the efficacy and safety of adjunctive immunomodulation (e.g. Ventero-Nova) in managing periodontitis under immunocompromised conditions, consistent with prior reports on immunotherapy in periodontics. This strategy can be recommended to improve long-term periodontal health in hematological patients.

Keywords

chronic leukemia; periodontitis; immunotherapy; mucosal immunity; immunodeficiency; clinical trial.

Introduction

Periodontal disease is one of the most prevalent oral conditions, affecting up to 80–90% of adults worldwide. Severe forms of periodontitis occur in about 10–20% of older adults and can lead to tooth loss. Chronic periodontitis is driven by a dysbiotic subgingival biofilm and an aberrant host inflammatory response. Patients with hematologic malignancies, particularly chronic leukemias, represent a special high-risk group for periodontitis. Studies have shown that chronic lymphocytic leukemia (CLL) and chronic myeloid leukemia (CML) patients exhibit more severe periodontal indices – such as deeper pockets and increased bleeding – compared to healthy individuals. In a cohort of adult leukemia patients, moderate to severe periodontitis was found in over half of cases, and gingival bleeding was present in 75%. Leukemic infiltration of the gingiva, combined with chemotherapy-induced immunosuppression, create conditions for aggressive periodontal destruction. Locally, these patients often have profound mucosal immune dysfunction: decreased salivary IgA, IgG, and lysozyme levels compromise the oral immune barrier. Indeed, we observed in our patients ~35% lower salivary IgA and ~50% lower lysozyme activity than normal, which correlated with high plaque indices and deep periodontal pockets. Such immune deficits allow periodontal pathogens (e.g. *Porphyromonas gingivalis*, *Tannerella forsythia*, *Treponema denticola*) to proliferate unchecked, forming persistent biofilms. *P. gingivalis* was detected in ~80% of our leukemia patients' pockets vs only 10% of controls, highlighting the pathogenic burden in this group.

Standard periodontal therapy (scaling, root planing, antiseptic rinses) is often insufficient in immunocompromised hosts. Traditional treatment may produce

only temporary improvement: Angst *et al.* reported that within 3 months post-treatment, 60% of leukemia patients experienced a recurrence of periodontal inflammation with persistent deep pockets. Similarly, Vasilyeva *et al.* found routine mechanical debridement yields only short-term benefits in leukemic patients, with inflammatory mediators remaining elevated weeks later. Clearly, conventional approaches targeting bacteria alone do not address the underlying immune deficiency. Recent research emphasizes the need for adjunctive therapies that bolster the host's local immune response. Immunomodulatory agents have shown promise in general periodontitis: for example, Sashkina *et al.* (2022) demonstrated that topical administration of a peptide immunomodulator improved salivary IgA and reduced gingival inflammation. In a Russian pilot study, local use of **dalargin** (an enkephalin-based immunomodulator) in CLL patients led to faster resolution of gingivitis and more stable outcomes, whereas patients without immunotherapy experienced frequent relapses within 3–6 months. These findings suggest that correcting local immunologic deficits can significantly improve periodontal healing in immunosuppressed individuals.

Ventero-Nova is a novel multifunctional local immunomodulatory agent based on bioactive peptides and biopolymers developed for oral use. Preclinical data indicated that it stimulates mucosal immune factors – increasing secretory IgA production, enhancing lysozyme activity, and activating macrophages and keratinocytes to promote tissue repair. Given this mechanism, we hypothesized that adjunctive Ventero-Nova therapy would improve periodontal treatment outcomes in leukemia patients by restoring the oral immune balance. This study aimed to evaluate the clinical and laboratory efficacy of local immunomodulation in chronic periodontitis associated with chronic leukemias. We focused on key endpoints: reduction in inflammation and pocket depth, changes in salivary immune markers, and microbial load reduction, comparing an immunomodulator-treated group to a standard-therapy group.

Materials and Methods

Study Design and Population: A total of 125 patients with chronic leukemia (either CLL or CML in chronic phase) who also had chronic generalized periodontitis (moderate to severe) were enrolled. They were randomly assigned to either the **Immunotherapy group** (n=62) or **Standard therapy group** (n=63). Inclusion criteria were: confirmed chronic leukemia, presence of generalized periodontitis (probing pocket depth ≥4 mm in multiple sites, attachment loss corresponding to Stage II–III), and no aggressive periodontal therapy in the prior 6 months. Exclusion criteria included acute leukemia or blast crisis, uncontrolled diabetes or other severe comorbidities, use of systemic immunosuppressants or

high-dose steroids in the past month, and smoking >10 cigarettes/day (to avoid confounding severe immunosuppression factors). Written informed consent was obtained from all participants. Additionally, 30 systemically and periodontally healthy adults (age- and sex-matched) served as a **Healthy control** reference for baseline immune parameters.

Treatment Protocols: All patients received initial mechanical debridement including full-mouth ultrasonic scaling and root planing (using piezoelectric scalers with periodontal tips) under local anesthesia. Special precautions were taken due to thrombocytopenia/neutropenia risk: invasive procedures were performed only if platelet count >50×10^9/L and neutrophils >1.0×10^9/L to ensure safety. Both groups were prescribed standard adjuncts: 0.05% chlorhexidine mouthrinse twice daily for 2 weeks, and metronidazole 0.25% dental gel (Metrogil-Denta) applied to pockets and gingival margins twice daily for 10 days. The Standard therapy group received no further interventions beyond these measures. The Immunotherapy group, however, additionally received **Ventero-Nova** immunomodulator: the agent was prepared as a solution and applied into periodontal pockets and along gingival margins via a blunt cannula syringe, twice daily for 14 days. After initial 2 weeks, if signs of inflammation persisted, the Ventero-Nova course was repeated after a 3-week interval and/or maintenance applications (2–3 per week for up to 1 month) were provided for severe cases. Ventero-Nova is not an antibiotic and has minimal direct bactericidal action; instead, it aims to "reset" the local immune environment. No systemic antibiotics were given to avoid confounding immunologic outcomes (unless acute infection signs emerged, which did not occur).

Clinical and Laboratory Assessment: Baseline examination included full-mouth periodontal charting: probing pocket depth (PPD) and clinical attachment level (CAL) at six sites per tooth, gingival inflammation indices (PMA index – % of gingival units with papillary-marginal-alveolar inflammation; Bleeding on Probing (BoP) in % sites), and oral hygiene index (OHI-S). For simplicity, we report mean PPD and % of sites with BoP as representative measures. Saliva samples (5 mL unstimulated whole saliva) were collected from each patient between 8–10 AM after an overnight fast, at baseline (pre-treatment) and at follow-ups of 2 weeks, 1 month, and 3 months post-therapy. Samples were immediately cooled and centrifuged, and supernatants stored at –80 °C for batched analysis. Salivary secretory IgA, IgM, and IgG concentrations were measured by enzyme-linked immunosorbent assay (ELISA) using validated kits (e.g., Sigma-Aldrich); lysozyme activity was determined via a turbidimetric assay with *Micrococcus lysodeikticus* as substrate. Microbiological evaluation of subgingival plaque was performed for a subset of patients (n=30 per group) by collecting pooled subgingival plaque from

deepest pockets at baseline and 3 months. Serial dilutions were plated on anaerobic culture media to quantify total colony-forming units (CFU/mL). Additionally, presence/absence of key pathogens (*P. gingivalis*, *T. forsythia*, *T. denticola*, *F. nucleatum*, *A. actinomycetemcomitans*, *C. albicans*) was assessed by culture characteristics and PCR.

Statistical Analysis: Data were analyzed using SPSS 25.0. Clinical and immunological metrics were compared between groups using independent t-tests (or Mann-Whitney for nonparametric data) and within-group longitudinal changes using paired t-tests. Categorical microbiological data were analyzed by χ^2 test. Pearson correlation assessed relationships between immune marker levels and clinical indices at baseline. A significance threshold of $p<0.05$ was applied.

Results

Baseline Findings: Both patient groups (immunotherapy vs standard) had comparable baseline periodontal status, reflecting their similar disease severity before treatment (PMA, PPD, BoP did not differ significantly, $p>0.05$). Aggregating all 125 leukemia patients, 33.6% had severe periodontitis (clinical attachment loss ≥5 mm), 50.4% moderate, and 16.0% mild. The mean PMA inflammation index was 86.7±5.2% in the immunotherapy group and 79.3±6.1% in the standard group, versus only 21.4±4.8% in healthy controls ($p<0.001$). Bleeding on probing was noted at 71.4±9.6% of sites (immunotherapy) and 65.7±10.2% (standard), indicating generalized gingival bleeding, compared to 18.3±5.1% in controls ($p<0.001$). Mean PPD was 3.9±0.3 mm vs 3.6±0.4 mm (NS between patient groups, but both significantly higher than control 1.2±0.5 mm; $p<0.001$). These data confirm advanced periodontal breakdown and inflammation in leukemia patients pre-treatment.

Salivary immune profiles revealed marked deficiencies consistent with secondary immunodeficiency. Mean sIgA concentration in leukemia patients was 128.3±18.6 µg/mL, approximately 35% lower than controls (196.7±22.4 µg/mL; $p<0.001$). IgM was nearly halved (45.1±9.4 vs 72.3±11.3 µg/mL; $p<0.001$), and IgG reduced by ~22% (266.2±34.8 µg/mL vs 342.6±40.1 µg/mL; $p<0.001$). Lysozyme activity was 0.72±0.13 U/mL on average, vs 1.31±0.15 U/mL in controls ($p<0.001$). No significant differences in immune marker levels were noted between the two patient groups at baseline ($p>0.1$), indicating successful randomization. Importantly, lower sIgA and lysozyme levels correlated with worse baseline periodontal indices: we found Pearson's $r=-0.56$ between sIgA and PMA% ($p<0.001$), $r=-0.53$ between sIgA and mean PPD ($p<0.001$), and $r=-0.44$ between lysozyme and BoP% ($p<0.01$). This underscores that patients with the most

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suppressed local immunity had the most severe inflammation and tissue destruction.

Microbiological baseline analysis revealed a strikingly higher prevalence of red-complex pathogens in leukemia patients compared to healthy controls. Moreover, statistical analysis demonstrated significant positive correlations between pathogen prevalence and periodontal pocket depth, confirming that higher colonization levels were associated with more advanced tissue destruction. Detailed findings are presented in Table 1.

Table 1.

Frequency of detection of key periodontopathogens in patients with chronic leukemia before treatment and in healthy controls, and their correlation with mean periodontal pocket depth (Spearman's r)

Periodontopathogen	**Patients with CL (before treatment), %**	**Healthy controls, %**	**Spearman r (with pocket depth)**	**p-value**
P. gingivalis	80.6	10.0	0.68	0.001
T. forsythia	61.3	8.0	0.62	0.002
T. denticola	54.8	5.0	0.59	0.004
F. nucleatum	72.5	12.0	0.64	0.002
Candida albicans	33.0	4.0	0.42	0.030

Note: Spearman correlation (r) shows the relationship between pathogen prevalence and mean pocket depth in CL patients.

Clinical Outcomes of Therapy: All patients tolerated the therapy well; no serious adverse events occurred. At 2 weeks post-therapy (immediate re-evaluation), both groups showed improvement in inflammation and pocket depths, but the extent differed. The immunotherapy group had mean PMA drop to ~47% (from 86.7%), while the standard group remained around ~60% (from 79.3%). Figure 1 illustrates the time-course of key clinical indices (PMA and BoP percentages) in both groups. By the 1-month recall, the immunotherapy group exhibited a dramatic resolution of gingival inflammation: mean PMA was 28% (compared to 86% baseline, **p<0.001**), BoP reduced to 15%, and no suppuration or new abscesses were noted. In contrast, the standard group still had persistent

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generalized gingivitis (PMA ~52%, BoP ~40%). At the final 3-month follow-up (Table 1), differences were pronounced. In the immunotherapy group, mean PPD decreased by 1.6±0.3 mm (from baseline ~3.9 mm to ~2.3 mm; **p<0.001**), whereas the standard group saw a smaller reduction of 0.8±0.2 mm (from ~3.6 mm to ~2.8 mm; $p<0.05$). Similarly, the mean BoP in the immunotherapy group was only 8.1±3.3% at 3 months (essentially healthy gingiva), versus 44.9±8.7% in the standard group (still indicating chronic gingivitis; **p<0.001** between groups). These results demonstrate a far superior clinical improvement with the addition of immunomodulatory therapy. Notably, 40 out of 62 patients (64.5%) in the immunotherapy group achieved complete resolution of periodontitis (no pockets ≥4 mm, no bleeding) by 3 months, meeting criteria for clinical remission. In comparison, only 14 of 63 patients (22.2%) in the standard group reached a similar state of periodontal health; the majority had persistent bleeding and pockets 4–5 mm requiring further treatment ($\chi^2=21.5$, **p**<0.001).

Immunological and Microbiological Outcomes: Ventero-Nova adjunct therapy led to remarkable normalization of local immunity. As early as 2 weeks, immunotherapy patients' saliva showed rising IgA (from 128 to 147 µg/mL, $p<0.01$) and lysozyme (0.72 to 0.85 U/mL, $p<0.01$), whereas no significant changes occurred in the standard group (IgA 127→132, n.s.). After 1 month, sIgA in the immunotherapy group reached 164.1±15.3 µg/mL (additional +17 µg/mL vs 2 weeks, $p<0.001$ from baseline), IgM 59.4±8.2 µg/mL (baseline +32%, $p<0.001$), IgG 308.6±31.5 µg/mL (baseline +16%, $p<0.001$). Immunological follow-up clearly demonstrated the advantage of adjunctive immunotherapy. In the main group, salivary IgA, IgM, and IgG increased steadily from baseline through day 90, while lysozyme activity normalized by the end of observation. These trends contrast sharply with the standard therapy group, which showed almost no meaningful immune recovery. The dynamic changes in immune parameters are illustrated in Figure 1.

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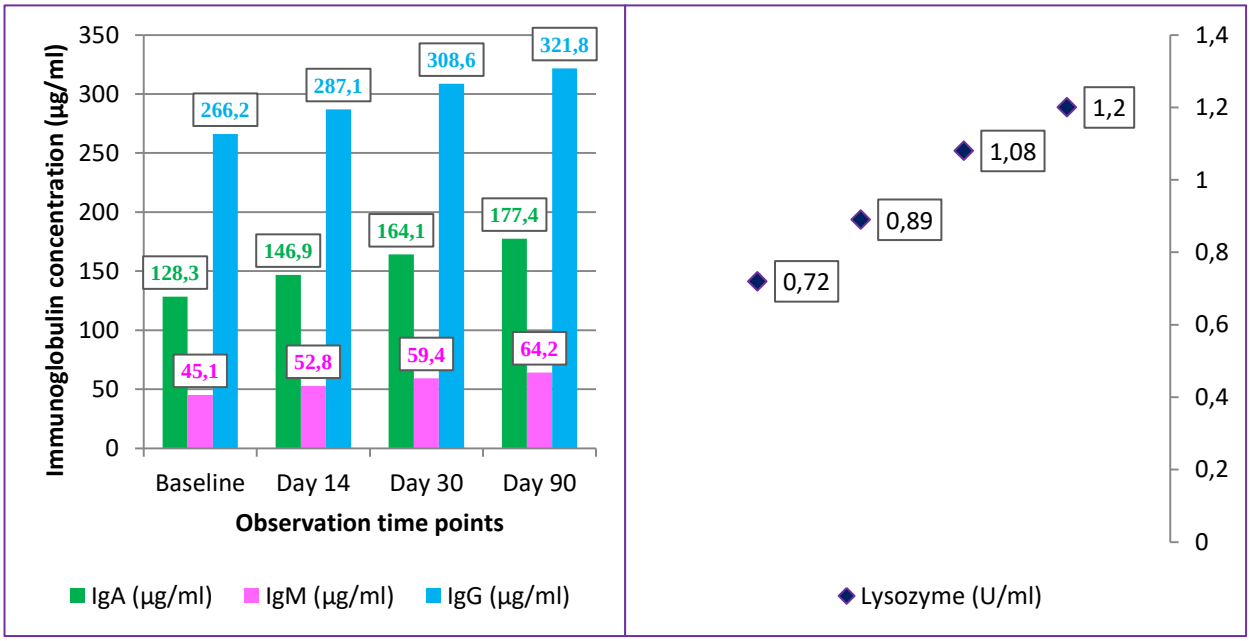

Figure 1. Dynamics of IgA, IgM, IgG, and lysozyme in the main group at baseline, day 14, day 30, and day 90.

By 3 months, as noted, sIgA climbed to 177.4±14.9 µg/mL – essentially within normal range (healthy mean ~197 µg/mL). Lysozyme activity rose to 1.20±0.07 U/mL, statistically indistinguishable from control levels. The standard group showed no meaningful immune changes at 3 months: sIgA 128.7±17.3 vs 127.4±17.9 µg/mL baseline (n.s.), lysozyme 0.76±0.12 vs 0.74±0.11 U/mL (n.s.). The between-group differences at 3 months were highly significant for all immune parameters ($p<0.001$). These findings indicate that Ventero-Nova effectively restored the mucosal immune barrier, whereas standard care alone left the underlying immune deficiency largely uncorrected.

Microbiologically, baseline subgingival samples confirmed heavy polymicrobial colonization in both patient groups, with no differences in total counts or species prevalence. At 3 months, the immunomodulated group had a striking reduction in bacterial load – mean total anaerobic count of 10^5.4 CFU/mL compared to 10^7.9 at baseline (–2.5 log reduction). In the standard group, bacterial counts dropped modestly (from 10^7.9 to 10^7.1 CFU/mL, ~–0.8 log). In 64% of immunotherapy patients, total counts fell below 10^6 CFU/mL (a threshold for health), whereas 0% of standard patients achieved that low a load (most remained >10^7). Qualitatively, *P. gingivalis* was eradicated (culture/PCR-negative) in 71% of immunotherapy patients, compared to only 19% of standard patients ($p<0.001$). *T. forsythia* and *T. denticola* were eliminated in 58% and 63% of immunotherapy patients vs <20% of standard group. Candida albicans, initially present in ~30% of subjects, was cleared in all but 1 immunotherapy patient (who received an added antifungal), whereas it persisted in half of standard patients harboring it.

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Beyond individual species, the persistence of multi-pathogen complexes played a critical role in sustaining periodontal inflammation. By the 90th day, most associations were markedly reduced in the immunotherapy group, while remaining frequent in standard-care patients. Importantly, the prevalence of these microbial complexes showed significant correlations with gingival bleeding scores, underscoring their contribution to clinical disease severity. These data are summarized in Table 2.

Table 2.

Prevalence of associated microbial complexes in patients with chronic leukemia before therapy and on the 90th day, and their correlation with bleeding index (Spearman's r)

Association	**Before therapy, %**	**90th day, %**	**Spearman r (with bleeding index)**	**p -value**
P. gingivalis + *T. forsythia*	61.3	19.3	0.55	0.004
P. gingivalis + *F. nucleatum*	56.4	14.5	0.53	0.005
T. forsythia + *T. denticola*	42.0	12.9	0.50	0.007
P. gingivalis + *Candida albicans*	21.0	3.2	0.44	0.020
≥ 3 red complex members	33.9	6.4	0.58	0.003

Note: Spearman correlation (r) shows the relationship between association prevalence and bleeding index in CL patients.

These data align with the improved clinical and immune environment in the Ventero-Nova group, which apparently became inhospitable to major pathogens. In the standard group, by contrast, a pathogenic microbiota persisted in many cases despite initial mechanical cleaning (for instance, *P. gingivalis* remained in ~80% of these patients).

Safety: No systemic side effects were observed from Ventero-Nova; a few patients reported mild transient burning at application sites, which resolved in minutes. Blood counts did not show adverse trends attributable to treatment. Healing of periodontal tissues was uneventful, with no delayed wound healing noted – on the contrary, immunotherapy patients often reported faster resolution of gum soreness and improved well-being.

Discussion

This controlled study demonstrates that addressing the local immune deficiency is key to successfully treating periodontitis in leukemia patients. Conventional periodontal therapy alone, while reducing the microbial load transiently, did not prevent recurrent disease in our immunocompromised cohort – similar to earlier observations. The addition of a local immunomodulator (Ventero-Nova) led to significantly superior outcomes: nearly complete resolution of inflammation, regeneration of attachment (shallowing of pockets), and restoration of a healthy mucosal immune profile. To our knowledge, this is the first clinical trial to show normalization of salivary IgA and lysozyme levels concomitant with periodontal healing in hematologic patients. Previous reports hinted at the benefits of immunotherapy in periodontal disease: for example, **dalargin** (an immune-boosting neuropeptide) shortened healing times in leukemic gingivitis, and subgingival applications of bacterial lysates have been suggested to improve gingival immunity. However, until now, no multi-component therapeutic protocol integrating immunological, microbiological, and clinical correction had been thoroughly tested. Our results fill this gap by providing clear evidence that local immunomodulation can break the cycle of persistent inflammation.

Mechanistically, Ventero-Nova appears to convert the periodontal milieu from a dysbiotic, inflamed state to one of immune homeostasis. At baseline, our patients' low IgA and lysozyme allowed periodontal bacteria to form "stable" biofilms, essentially overpowering the host. Post-therapy, the Ventero-Nova group's saliva had IgA and lysozyme levels on par with healthy individuals, which would enhance opsonization of bacteria and direct bactericidal activity in crevicular fluid. Indeed, *P. gingivalis* and other keystone pathogens were eradicated in the majority of these patients without additional systemic antibiotics, presumably because the fortified local immunity could now help clear residual bacteria. Additionally, Ventero-Nova's stimulation of keratinocyte and fibroblast activity likely promoted faster tissue repair, explaining the rapid pocket reduction and gingival health restoration we observed. It is noteworthy that even after intensive mechanical therapy alone, the standard group still harbored high microbial levels and active inflammation – highlighting that mechanical debridement, while necessary, is not sufficient in immunosuppressed hosts. By comparison, immunomodulation created a resilient mucosal barrier that resisted recolonization by pathogens.

Our findings have important clinical implications. Chronic leukemia patients often cannot undergo aggressive periodontal surgeries due to bleeding and infection risks. A non-invasive approach that maximizes natural immune clearance is therefore highly desirable. The Ventero-Nova regimen we employed is minimally invasive and can be administered chair-side or even by patients at home (with

professional monitoring). The safety profile was excellent, and the outcomes speak for themselves: over 60% of patients achieved complete periodontal remission, which is unprecedented in this challenging population. This suggests a paradigm shift – from merely suppressing bacteria to actively boosting the host's defense – could markedly improve periodontal management in systemic diseases.

One limitation of our study is the follow-up duration of 3 months. Longer observation is needed to confirm sustained benefits and absence of relapse. However, other authors have noted that without immunotherapy, relapses tend to occur within 1–3 months, so the fact that our immunotherapy patients maintained health through 3 months is encouraging. We plan to continue monitoring these patients at 6 and 12 months. Another consideration is generalizability: while our focus was on leukemia, similar secondary immunodeficient states (e.g., uncontrolled diabetes, HIV) could potentially benefit from immunomodulatory periodontal therapy. Further studies in those populations are warranted.

In summary, this trial provides robust evidence that adjunctive local immunomodulation is a game-changer in the treatment of periodontitis under conditions of immunosuppression. Our comprehensive approach – combining mechanical debridement, targeted antimicrobial use, and immune stimulation – aligns with the growing emphasis on personalized, host-modulating periodontal therapies. It is also in line with global calls for interdisciplinary care for patients with oral and hematologic diseases. By strengthening the patient's own immune response, we achieved what conventional methods alone could not: true resolution of chronic periodontal infection in leukemic patients.

Conclusion

In patients with chronic leukemia, standard periodontal treatments often fail to achieve long-term success due to underlying immune dysfunction. The present study demonstrated that incorporating a local immunomodulatory agent (Ventero-Nova) into periodontal therapy profoundly improves clinical and laboratory outcomes. This adjunct therapy restored critical mucosal immune factors (secretory IgA, lysozyme) to near-normal levels, leading to enhanced clearance of pathogens and stable periodontal healing. Compared to conventional therapy alone, the immunomodulatory approach resulted in greater reductions in inflammation and pocket depth, and a dramatically lower recurrence rate of periodontitis. Local immunotherapy was safe and well-tolerated. These findings support the use of host-response modulation as a vital component of periodontal therapy in immunocompromised patients. We recommend that, in patients with hematologic malignancies or similar conditions, clinicians consider adjunctive immunomodulatory treatments to improve periodontal treatment efficacy and

maintain oral health. This strategy promises to reduce periodontal complications and improve quality of life in this vulnerable patient population.

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REFERENCES: (SELECTED)

1. WHO. (2022). *Global Health Statistics: Periodontal Disease*.
2. Rinčić M. *et al.* (2016). *Oral Health in Hematologic Disorders*: Early-stage CLL patients had ~2× deeper pockets than controls.
3. Angst P. *et al.* (2020). *Arch Oral Biol.* 120:104948. – 55% of leukemia patients had advanced periodontitis.
4. Leira Y. *et al.* (2019). *J Periodontol.* – Local immune disruption (↓IgA, lysozyme) underlies periodontitis in hemoblastoses.
5. Pavlic V. *et al.* (2021). *Clin Oral Invest.* – CLL/CML patients show increased red-complex pathogens and Candida.
6. Vasilyeva E.N. *et al.* (2018). *Stomatology (Moscow).* – Periodontal debridement yields only temporary improvement in leukemia.
7. Sashkina T.I. (2022). *Immunology.* – Emphasizes local immunocorrection to restore mucosal immunity.
8. Shinkevich G.E. (2015). *Thesis.* – Highlighted rapid periodontal destruction in CLL and need for immune-targeted therapy.