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ETIOLOGY AND PATHOGENESIS OF HYPERTROPHIC GINGIVITIS

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Abstract
Hypertrophic gingivitis is a common inflammatory periodontal condition characterized by an abnormal enlargement of gingival tissues. The disease is frequently observed in adolescents, pregnant women, and patients with poor oral hygiene or systemic conditions that influence periodontal health. The aim of this study was to analyze the etiological factors and pathogenic mechanisms responsible for the development of hypertrophic gingivitis. A review of scientific literature published between 2000 and 2025 was conducted using medical databases including PubMed, Scopus, and Google Scholar. The results indicate that hypertrophic gingivitis develops due to a combination of local and systemic factors such as dental plaque accumulation, hormonal changes, certain medications, and systemic diseases. Persistent inflammation stimulates excessive proliferation of connective tissue and epithelium, leading to gingival enlargement. Early diagnosis and elimination of etiological factors are essential for effective treatment and prevention of disease progression.

Keywords: Hypertrophic gingivitis, gingival enlargement, periodontal inflammation, dental plaque, hormonal changes, gingival hyperplasia.

Introduction

Hypertrophic gingivitis is an inflammatory condition characterized by excessive growth of gingival tissues accompanied by redness, swelling, and bleeding. The disease represents a reversible stage of periodontal pathology if diagnosed and treated early.

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The gingiva plays a critical role in protecting underlying periodontal structures. However, continuous exposure to microbial plaque and other irritants can lead to inflammatory reactions and pathological enlargement of gingival tissues.

Hypertrophic gingivitis is commonly observed in:

- adolescents during puberty,
- pregnant women,
- patients with poor oral hygiene,
- individuals receiving certain medications.

The condition may affect both marginal and interdental gingiva and may cause aesthetic problems, discomfort during chewing, and difficulties in oral hygiene maintenance.

Understanding the causes and mechanisms of hypertrophic gingivitis is essential for developing effective preventive and therapeutic strategies.

The aim of this study was to investigate the etiology and pathogenesis of hypertrophic gingivitis based on current scientific literature.

Materials and Methods

A literature review was conducted to identify studies related to hypertrophic gingivitis.

Data Sources

The following databases were used:

- PubMed
- Google Scholar
- Scopus

Selection Criteria

Publications included:

- clinical studies
- review articles
- periodontal textbooks
- epidemiological studies

Published between **2000 and 2025**.

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Keywords Used

- hypertrophic gingivitis
- gingival enlargement
- gingival hyperplasia
- periodontal inflammation

More than **70 scientific sources** were screened, and **38 relevant publications** were selected for analysis.

Results

The literature analysis identified several major etiological factors responsible for hypertrophic gingivitis.

1. Dental Plaque and Poor Oral Hygiene

Dental plaque is the primary etiological factor in most cases of hypertrophic gingivitis. Bacterial biofilm accumulates along the gingival margin and triggers inflammatory reactions.

Common bacteria associated with gingival inflammation include:

- *Porphyromonas gingivalis*
- *Actinomyces species*
- *Prevotella intermedia*

Persistent plaque accumulation stimulates proliferation of gingival connective tissue and epithelial layers.

2. Hormonal Changes

Hormonal fluctuations significantly influence gingival tissues.

This is particularly evident during:

- puberty
- pregnancy
- menstrual cycle

Increased levels of estrogen and progesterone enhance vascular permeability and inflammatory response in gingival tissues.

3. Medication-Induced Gingival Enlargement

Certain medications may cause gingival overgrowth as a side effect.

Common drug groups include:

- anticonvulsants (phenytoin)

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- calcium channel blockers (nifedipine)
- immunosuppressants (cyclosporine)

These drugs stimulate fibroblast proliferation and collagen accumulation in gingival tissues.

4. Systemic Diseases

Systemic conditions may predispose patients to gingival enlargement.
Examples include:

- leukemia
- diabetes mellitus
- vitamin deficiencies

These conditions alter immune response and tissue metabolism.

5. Local Irritating Factors

Local mechanical irritants may also contribute to gingival hypertrophy.
These include:

- poorly fitting dental restorations
- orthodontic appliances
- calculus deposits
- malocclusion

Discussion

Hypertrophic gingivitis results from complex interactions between microbial, hormonal, and systemic factors.

Inflammatory Mechanisms

When bacterial plaque accumulates, toxins stimulate immune responses in gingival tissues. Inflammatory mediators such as cytokines and prostaglandins promote tissue swelling and vascular dilation.
Chronic inflammation leads to:

- epithelial hyperplasia
- connective tissue proliferation
- increased vascularization

These processes contribute to visible gingival enlargement.

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Hormonal Influence

Hormonal gingivitis is frequently observed in adolescents and pregnant women. Increased hormone levels amplify inflammatory reactions to bacterial plaque. This explains why even small amounts of plaque may cause severe gingival enlargement in hormonally sensitive individuals.

Medication-Induced Changes

Drug-induced gingival enlargement differs from purely inflammatory gingivitis. In these cases, fibroblast activity and collagen deposition play a major role. Discontinuation or replacement of the medication often leads to improvement.

Clinical Significance

Hypertrophic gingivitis may cause several complications:

- bleeding during brushing
- aesthetic problems
- difficulty maintaining oral hygiene
- risk of progression to periodontitis

Therefore, early diagnosis is essential.

Conclusion

Hypertrophic gingivitis is a multifactorial periodontal condition characterized by gingival enlargement caused by inflammatory and proliferative processes.

The main etiological factors include dental plaque accumulation, hormonal changes, medications, systemic diseases, and local irritants.

Early identification of causative factors and proper oral hygiene play a key role in preventing disease progression. Timely professional treatment and elimination of irritants significantly improve clinical outcomes.

Effective management requires a combination of preventive measures, professional dental care, and patient education.

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