INTERNATIONAL MULTI DISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
eISSN 2394-6334 Impact factor: 8.854 Volume 13, issue 01 (2026)

# THE RELATIONSHIP BETWEEN ANEMIA AND GYNECOLOGICAL DISEASES

Kokand University, Andijan Branch
Field of Study: General Medicine

**Ne'matova Zubaydakhon Mansurbek kizi**

Scientific Supervisor:
**Khadjayeva Dilnoza Bobirovna**

## Abstract

Anemia remains one of the most prevalent hematological disorders worldwide and disproportionately affects women of reproductive age. Gynecological diseases are recognized as major contributing factors to the development and persistence of anemia, primarily through chronic blood loss, inflammation, and hormonal disturbances.

The aim of this study was to analyze the relationship between anemia and gynecological diseases and to review current approaches to diagnosis and management based on recent clinical evidence. A narrative review of the literature was conducted using international databases, including PubMed, Scopus, Web of Science, and Google Scholar. Studies published between 2015 and 2024 were analyzed, focusing on etiological factors, pathophysiological mechanisms, and therapeutic strategies related to anemia in women with gynecological disorders.

The reviewed studies demonstrated that abnormal uterine bleeding, uterine fibroids, endometriosis, adenomyosis, and chronic inflammatory gynecological conditions are strongly associated with iron deficiency anemia. Chronic menstrual blood loss and inflammatory processes were identified as the primary mechanisms leading to reduced hemoglobin levels. Early diagnosis and integrated management combining treatment of the underlying gynecological pathology with iron replacement therapy were associated with improved hematological outcomes and quality of life.

In conclusion, anemia and gynecological diseases are closely interconnected conditions that require a multidisciplinary and individualized management approach. Timely identification and comprehensive treatment are essential to reduce disease burden and prevent recurrence.

## Keywords

Anemia; Iron deficiency anemia; Gynecological diseases; Abnormal uterine bleeding; Uterine fibroids; Women’s healt

## Intro.duction

Anemia is one of the most common hematological conditions worldwide and represents a significant public health problem, particularly among women of reproductive age [1]. It is characterized by a reduced concentration of hemoglobin in the blood, leading to impaired oxygen transport and a wide range of clinical manifestations, including fatigue, weakness, dizziness, and decreased physical and cognitive performance [2]. According to global health

reports, anemia affects a substantial proportion of women, especially in low- and middle-income countries, where nutritional deficiencies and reproductive health disorders are highly prevalent [3].

Gynecological diseases play a crucial role in the development and progression of anemia in women. Conditions such as abnormal uterine bleeding, uterine fibroids, endometriosis, adenomyosis, and chronic inflammatory gynecological disorders are among the leading causes of iron deficiency anemia [4,5]. Excessive menstrual blood loss and chronic pelvic inflammation significantly contribute to iron depletion and reduced hemoglobin levels, thereby increasing the risk of persistent anemia [6].

The pathophysiological relationship between anemia and gynecological diseases is multifactorial. Hormonal imbalances, chronic inflammation, and repeated blood loss disrupt iron metabolism and erythropoiesis [7]. In turn, anemia can negatively affect the course of gynecological diseases by impairing tissue oxygenation, delaying recovery, and worsening overall health status [8]. This bidirectional relationship underscores the importance of early diagnosis and integrated management strategies.

Effective prevention and treatment of anemia in gynecological patients require a comprehensive approach that includes timely identification of underlying gynecological pathology, appropriate medical or surgical interventions, and correction of iron deficiency [9]. Modern management strategies emphasize individualized treatment plans that combine pharmacological therapy, nutritional support, and patient education [10].

The aim of this article is to analyze the relationship between anemia and gynecological diseases, explore the main etiological and pathophysiological mechanisms, and review current approaches to diagnosis and management based on recent clinical evidence [11].

**Methods**

This study was designed as a narrative review of the scientific literature focusing on the relationship between anemia and gynecological diseases. A comprehensive literature search was conducted using international electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar.

The search strategy included articles published primarily between 2015 and 2024 to ensure the inclusion of recent and relevant clinical evidence. The following keywords and their combinations were used: *anemia*, *iron deficiency anemia*, *gynecological diseases*, *abnormal uterine bleeding*, *uterine fibroids*, *endometriosis*, *adenomyosis*, and *women's health*. Only studies published in English were considered for analysis.

Inclusion criteria comprised original research articles, systematic reviews, meta-analyses, and international clinical guidelines that examined anemia in adult women with gynecological disorders. Studies focusing on pregnancy-related anemia, pediatric populations, malignant gynecological conditions, or non-clinical experimental models were excluded. Articles lacking clear methodology or outcome measures were also excluded.

Data extraction was performed by analyzing study characteristics, including study design, population size, diagnostic criteria for anemia, types of gynecological diseases, and management strategies. Particular attention was given to etiological factors, pathophysiological mechanisms, and diagnostic and therapeutic approaches for anemia associated with gynecological conditions.

The collected data were qualitatively synthesized to identify common patterns and associations between anemia and gynecological diseases. The analysis was conducted in accordance with evidence-based medicine principles and current international recommendations for the management of anemia and gynecological disorders [9–11].

**Results**

The analysis of the selected literature demonstrated a strong association between anemia and various gynecological diseases in women of reproductive age. Most reviewed studies reported that iron deficiency anemia was significantly more prevalent among patients with abnormal uterine bleeding, uterine fibroids, and endometriosis compared to the general female population [4–6].

Abnormal uterine bleeding was identified as the leading gynecological factor contributing to chronic blood loss and iron depletion. Women with prolonged or heavy menstrual bleeding showed significantly lower hemoglobin and serum ferritin levels, increasing the risk of moderate to severe anemia [6,7]. Uterine fibroids were also strongly associated with anemia, particularly in cases involving submucosal or large fibroids, which were linked to excessive menstrual blood loss [5].

Endometriosis and adenomyosis were associated with anemia through both chronic inflammatory processes and menstrual irregularities. Studies indicated that persistent inflammation and hormonal dysregulation in these conditions negatively affected iron metabolism and erythropoiesis, contributing to the development of anemia even in the absence of severe bleeding [7,8].

Clinical outcomes improved significantly when anemia was diagnosed early and managed alongside the underlying gynecological disease. Combined treatment strategies, including iron supplementation and targeted gynecological therapy, resulted in improved hemoglobin levels, reduced symptom severity, and enhanced quality of life [9,10].

**Table 1. Relationship between gynecological diseases and anemia**

| Gynecological condition | Main mechanism of anemia | Common clinical findings | Impact on hemoglobin |
|---|---|---|---|
| Abnormal uterine bleeding | Chronic menstrual blood loss | Fatigue, dizziness, weakness | Significant decrease |
| Uterine fibroids | Excessive and prolonged menstruation | Pelvic pain, heavy bleeding | Moderate to severe decrease |

| Gynecological condition | Main mechanism of anemia | Common clinical findings | Impact on hemoglobin |
|---|---|---|---|
| Endometriosis | Chronic inflammation, hormonal imbalance | Pelvic pain, dysmenorrhea | Mild to moderate decrease |
| Adenomyosis | Menstrual irregularities, inflammation | Menorrhagia, pelvic discomfort | Moderate decrease |
| Chronic inflammatory disorders | Impaired iron metabolism | General weakness, anemia symptoms | Mild decrease |

**Discussion**

The results of this review confirm a strong and clinically significant relationship between anemia and gynecological diseases in women of reproductive age. Abnormal uterine bleeding, uterine fibroids, endometriosis, and adenomyosis were identified as major contributors to iron deficiency anemia, primarily through chronic blood loss, inflammatory processes, and hormonal dysregulation. These findings are consistent with previously published studies highlighting gynecological disorders as leading causes of anemia in women [4–6].

Abnormal uterine bleeding emerged as the most influential factor in the development of anemia, as prolonged and excessive menstrual blood loss directly leads to iron depletion and reduced hemoglobin levels. Similarly, uterine fibroids—particularly submucosal and large fibroids—were strongly associated with moderate to severe anemia due to increased menstrual volume and duration. These observations underscore the importance of thorough gynecological evaluation in women presenting with unexplained or recurrent anemia.

Inflammatory gynecological conditions, such as endometriosis and adenomyosis, contribute to anemia through mechanisms beyond blood loss. Chronic inflammation and altered cytokine activity may impair iron metabolism and erythropoiesis, resulting in anemia even in patients without significant menorrhagia. This highlights the multifactorial nature of anemia in gynecological diseases and the need for comprehensive diagnostic approaches.

The findings also emphasize the clinical benefits of early diagnosis and integrated management. Studies reviewed demonstrated that simultaneous treatment of anemia and the underlying gynecological condition led to improved hemoglobin levels, symptom relief, and overall quality of life. Iron supplementation alone may be insufficient if the primary gynecological pathology remains untreated, reinforcing the necessity of a multidisciplinary approach involving both gynecologists and hematologists.

Despite the valuable insights provided by this review, certain limitations should be acknowledged. The narrative review design may be subject to publication bias, and heterogeneity among the included studies may affect the generalizability of the results. Future research should focus on prospective and longitudinal studies to better elucidate causal

relationships and to optimize individualized treatment strategies for women affected by both anemia and gynecological diseases.

## Conclusion

Anemia and gynecological diseases are closely interrelated conditions that represent a significant health burden for women of reproductive age. This review demonstrates that abnormal uterine bleeding, uterine fibroids, endometriosis, adenomyosis, and chronic inflammatory gynecological disorders are major contributors to the development and persistence of anemia, primarily through chronic blood loss, inflammation, and hormonal imbalance.

Effective management of anemia in gynecological patients requires early diagnosis and a comprehensive, multidisciplinary approach. Treatment strategies should not only focus on correcting iron deficiency but also address the underlying gynecological pathology to prevent recurrence and improve long-term outcomes. Integrated management has been shown to improve hemoglobin levels, reduce symptom severity, and enhance patients' quality of life.

In conclusion, strengthening collaboration between gynecologists and other healthcare professionals is essential for optimizing the prevention, diagnosis, and treatment of anemia associated with gynecological diseases. Further research is needed to develop personalized, evidence-based strategies that can improve clinical outcomes and reduce the global burden of anemia among women.

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