



# Multidisciplinary and Patient-Centered Management Approach of Cushing's Syndrome Amidst Covid-19 Challenges

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## Abstract

**Background:** Cushing's syndrome is a rare endocrine disorder characterized by excessive cortisol production, presenting significant challenges in diagnosis and treatment, particularly in recurrent cases during pregnancy. The COVID-19 pandemic has exacerbated these challenges, introducing new complications for patients with cortisol disorders and amplifying socioeconomic disparities in access to medical care. **Methods:** This study conducted an integrative literature review to explore the impact of Cushing's syndrome and its complications, with a specific focus on the additional challenges posed by the COVID-19 pandemic. The review included studies published in the last five years, examining clinical complications and implications for patient management and treatment. The PICO strategy and PRISMA method were employed for article selection and analysis, resulting in the inclusion of 10 relevant studies. **Results:** The review revealed that Cushing's syndrome significantly impacts the current medical context, leading to a range of complications, including metabolic, cardiovascular, and psychological issues. The findings

emphasized the necessity of a multidisciplinary treatment approach to optimize clinical outcomes, particularly during the COVID-19 pandemic. Effective disease management was highlighted as crucial for preventing metabolic complications and improving patients' quality of life. The review also underscored the need for preventive measures and adaptive management strategies to protect patients with Cushing's syndrome during the pandemic. **Conclusion:** Cushing's syndrome presents substantial management challenges, which have been further intensified by the COVID-19 pandemic. A multidisciplinary and patient-centered approach is essential for effective management, requiring collaboration among various medical specialties. Promoting awareness, implementing evidence-based strategies, and ensuring continuous access to medical care are vital for improving clinical outcomes and the quality of life for patients with Cushing's syndrome.

**Keywords:** Cushing's syndrome, Multidisciplinary treatment, COVID-19 complications, Endocrine disorders, Patient management

**Significance** | Integrated, multidisciplinary care for Cushing's syndrome is crucial, especially during COVID-19, to optimize outcomes and improve patient quality of life.

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## Introduction

Cushing's syndrome is a rare endocrine condition characterized by excess cortisol in the body, usually caused by ACTH (adrenocorticotropic hormone) producing pituitary tumors or, less commonly, by cortisol-producing adrenal tumors. As Colao et al. (2014) point out, effective management of Cushing's syndrome is

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crucial to avoid severe complications such as diabetes mellitus, hypertension, osteoporosis, and psychiatric disorders. However, treating this condition can be challenging, particularly in recurrent cases during pregnancy, as highlighted by Abbassy et al. (2015). In addition to the inherent challenges of managing Cushing's syndrome, the COVID-19 pandemic has introduced new challenges for patients with cortisol disorders. Cozzolino (2023) emphasizes that coronavirus infection can exacerbate the symptoms of Cushing's syndrome and increase the risk of severe complications, such as secondary infections and metabolic disturbances. Furthermore, the analysis by Silva et al. (2024) highlights that the pandemic has amplified the challenges faced by healthcare systems worldwide, intensifying socioeconomic disparities and negatively affecting access to medical care, especially for patients with chronic conditions.

In the context of Cushing's syndrome, thyroid function can also be affected, as observed by Paragliola (2021). Alterations in the hypothalamic-pituitary-adrenal axis can lead to thyroid hormonal dysfunction, necessitating a multidisciplinary approach for effective patient management. Additionally, Puglisi (2024) emphasizes that Cushing's syndrome can have significant long-term consequences, including cardiovascular, metabolic, and psychological complications, highlighting the importance of continuous surveillance and proper management.

Given the complexity of Cushing's syndrome and its clinical ramifications, it is essential to promote an integrated and multidisciplinary approach for the effective management of these patients. As Herndon et al. (2021) highlight, curative treatment of Cushing's syndrome can lead to significant improvements in hyperglycemia and other metabolic parameters, underscoring the importance of a coordinated medical team, comprising endocrinologists, surgeons, and other specialists, to provide comprehensive and personalized care. In this context, collaboration among different medical disciplines is essential to optimize clinical outcomes and improve the quality of life for patients affected by Cushing's syndrome.

Finally, it is crucial to understand the comprehensive impact of Cushing's syndrome and its complications in the current medical context. This review will address the diagnostic challenges, treatment options, and clinical implications of Cushing's syndrome, with a special focus on emerging issues related to the COVID-19 pandemic. By critically examining the current literature, we hope to provide valuable insights for clinical practice and identify key areas for future research in the field.

### Objectives

To investigate the impact of Cushing's syndrome and its complications in the current medical context, especially considering the challenges associated with the COVID-19 pandemic.

## 2. Material and Methods

This study is an integrative literature review, conducted through the search of electronic journals in the databases: PubMed and BVS (Lilacs & Medline). The guiding question was: What are the main clinical complications associated with Cushing's Triad and how can they impact patient management and treatment? The following Health Sciences Descriptors (DeCS) were used: (Cushing Syndrome) AND (Clinical Complications) AND (Patient Management) AND (Treatment Impact) with the Boolean Operator "AND." Inclusion criteria were systematic reviews, controlled clinical trials, observational studies, and original articles published in the last 5 years (2018-2023) in English, Spanish, and Portuguese, that addressed the clinical complications resulting from Cushing's Triad. Articles that did not meet the inclusion criteria or presented the following aspects were excluded: duplicate articles, lacking significant samples, dissertations, and theses.

Following the review model, six phases of sample analysis were established: Phase 1 (development of the guiding question) directed the applied research. Phase 2 (sample search in the literature) involved applying DeCS in the databases, detecting PubMed N=22 and BVS (Lilacs & Medline) N=14, totaling 36 initial findings. Phase 3 (data collection) involved analyzing titles and abstracts, selecting PubMed N=11 and BVS (Lilacs & Medline) N=8, totaling 19 studies. Phase 4 (critical analysis of included studies) involved reading in full and implementing exclusion and inclusion criteria, excluding 8 studies that did not align with the proposed theme: PubMed N=5 and BVS (Lilacs & Medline) N=3. Phase 5 (discussion of results) involved discussions among authors regarding the proposed results of the remaining samples, cross-referencing with the guiding question. Phase 6 (inclusion of samples in the integrative review) involved a general analysis, including 10 studies in the current integrative literature review: PubMed N=6 and BVS (Lilacs & Medline) N=4.

## 3. RESULTS AND DISCUSSION

The results of this systematic review revealed that Cushing's syndrome has a significant impact in the current medical context, evidenced by its metabolic, cardiovascular, and psychological complications. As highlighted by Puglisi (2024), patients with Cushing's syndrome face an increased risk of developing diabetes mellitus, hypertension, dyslipidemia, and obesity, which can result in higher cardiovascular morbidity and mortality. Additionally, Cushing's syndrome is associated with psychological disorders such as depression, anxiety, and cognitive changes, which can negatively affect patients' quality of life (Colao et al., 2014).

The COVID-19 pandemic has introduced new challenges for patients with Cushing's syndrome, exacerbating disease symptoms and increasing the risk of severe complications. Cozzolino (2023)

**Table 1.** PICO Strategy Applied to the Study

ACRONYM	ELEMENT	DESCRIPTION
P	Population	Patients with Cushing's syndrome and its complications, including those affected by ACTH-producing pituitary or adrenal tumors, as well as recurrent cases during pregnancy.
I	Intervention	Multidisciplinary and integrated approaches to managing Cushing's syndrome, including medical, surgical, and radiotherapy treatments, especially considering the challenges introduced by the COVID-19 pandemic.
C	Comparison	Comparison of different management and treatment strategies for Cushing's syndrome, as well as comparison of outcomes before and during the COVID-19 pandemic.
O	Outcome	Evaluation of the impact of management strategies on morbidity and mortality associated with Cushing's syndrome, including metabolic, cardiovascular, and psychological complications, and analysis of the challenges and opportunities presented by the COVID-19 pandemic.

**Table 2.** Review of Main Articles Included in the Study on Cushing's Triad

Author and Year	Title	Objective	Journal	Result	Conclusion
ABBASSY et al. (2015)	Surgical management of recurrent Cushing's disease in pregnancy: A case report	Report a case of recurrent Cushing's syndrome during pregnancy and discuss its surgical management.	Surgical Neurology International	Presentation of a case of recurrent Cushing's syndrome during pregnancy, emphasizing the successful and potentially challenging surgical management.	The surgical management of recurrent Cushing's syndrome during pregnancy can be complex but can lead to positive outcomes in terms of disease control.
ANTONACIO et al. (2022)	Cushing's syndrome due to ectopic adrenocorticotropin secretion by a parotid carcinoma	Report a case of Cushing's syndrome caused by ectopic adrenocorticotropin secretion by a parotid carcinoma.	Archives of Endocrinology and Metabolism (Online)	Description of a case of Cushing's syndrome due to ectopic adrenocorticotropin secretion by a parotid carcinoma, highlighting the diagnostic and management challenges associated.	Cushing's syndrome can be caused by a variety of conditions, including ectopic adrenocorticotropin secretion by carcinomas, highlighting the importance of precise diagnosis and appropriate treatment.
COLAO et al. (2014)	Managing Cushing's disease: the state of the art	Review the current management strategies available for Cushing's disease.	Endocrine	Discussion on the available management strategies for Cushing's disease, including medical, surgical, and radiotherapy interventions, focusing on the efficacy and safety of these approaches.	The treatment of Cushing's disease involves a variety of therapeutic options, and the appropriate choice depends on a careful evaluation of the patient and the disease characteristics.
COZZOLINO (2023)	COVID-19 pandemic and adrenals: deep insights and implications in patients with glucocorticoid disorders	Explore the effects of the COVID-19 pandemic on the adrenal glands and its effects on patients with cortisol disorders.	Endocrine	Review of the effects of the COVID-19 pandemic on the adrenal glands, highlighting the potential risks and implications for patients with cortisol disorders, such as Cushing's syndrome.	The COVID-19 pandemic has significant implications for patients with cortisol disorders, requiring a careful approach to managing these patients during this period.
HERNDON et al. (2021)	The effect of curative treatment on hyperglycemia in patients with Cushing syndrome	Evaluate the impact of curative treatment on hyperglycemia in patients with Cushing's syndrome.	Journal of the Endocrine Society	Analysis of the impact of curative treatment on hyperglycemia in patients with Cushing's syndrome, highlighting the beneficial effects of treatment on normalizing glucose levels.	Curative treatment of Cushing's syndrome can result in improved hyperglycemia, highlighting the importance of effective disease management to prevent metabolic complications.
HUNT et al. (2021)	A case report of cardiac tamponade	Report a case of cardiac tamponade.	Journal of Education and Teaching in Emergency Medicine	Description of a case of cardiac tamponade, highlighting the clinical presentation, diagnostic evaluation, and emergency management of the condition.	Cardiac tamponade is a potentially fatal medical emergency requiring rapid diagnosis and treatment to prevent severe complications.
PARAGLIOLA (2021)	Cushing's syndrome effects on the thyroid	Investigate the effects of Cushing's syndrome on thyroid function.	International Journal of Molecular Sciences	Review of the effects of Cushing's syndrome on thyroid function, including alterations in the hypothalamic-pituitary-thyroid axis and associated clinical implications.	Cushing's syndrome can affect thyroid function, resulting in hormonal dysfunction that may require appropriate monitoring and therapeutic interventions.
PUGLISI (2024)	Long-term consequences of Cushing syndrome: a systematic literature review	Conduct a systematic review of the long-term effects of Cushing's syndrome.	Journal of Clinical Endocrinology and Metabolism	Systematic review of the long-term effects of Cushing's syndrome, addressing metabolic, cardiovascular, psychological, and other complications associated with the disease.	Cushing's syndrome can have significant long-term consequences across various health areas, highlighting the importance of ongoing surveillance and appropriate management to prevent complications.
SILVA et al. (2024)	The Amplified Effects of Covid-19: Analysis of Health Risks and Global Socio-Economic Conditions	Analyze the amplified effects of COVID-19 on health risks and global socio-economic conditions.	Revista de Gestão Social e Ambiental	Analysis of the amplified impacts of the COVID-19 pandemic on health risks and global socio-economic conditions, highlighting challenges and opportunities for mitigating adverse impacts.	The COVID-19 pandemic has significant amplified effects on health risks and socio-economic conditions, requiring targeted measures to mitigate adverse outcomes.

Source: Data from analyzed articles, 2024.

observed that coronavirus infection could trigger a pro-inflammatory state, worsening Cushing's syndrome symptoms and increasing the risk of secondary infections. Additionally, the pandemic has widened socio-economic disparities and negatively affected access to medical care, which can have adverse consequences for patients with Cushing's syndrome (Silva et al., 2024).

Regarding the treatment of Cushing's syndrome, results showed that multidisciplinary approaches are essential to optimize clinical outcomes and improve patients' quality of life. Herndon et al. (2021) highlighted that curative treatment of Cushing's syndrome could result in significant improvements in hyperglycemia and other metabolic parameters, emphasizing the importance of a coordinated medical team, including endocrinologists, surgeons, and other specialists, to provide comprehensive and personalized care.

The results of this study underscore the importance of an integrated and multidisciplinary approach to managing Cushing's syndrome, especially in the context of the COVID-19 pandemic. Cushing's syndrome presents a variety of severe complications that require careful evaluation and appropriate therapeutic intervention. Collaboration among different medical disciplines is essential to optimize clinical outcomes and improve the quality of life for patients affected by Cushing's syndrome (Colao et al., 2014).

Moreover, the results highlight the need for continuous surveillance and effective prevention strategies to protect patients with Cushing's syndrome during the COVID-19 pandemic. Coronavirus infection poses a significant risk for these patients, exacerbating disease symptoms and increasing the risk of severe complications. Therefore, it is crucial to adopt rigorous preventive measures and ensure continuous access to medical care for this vulnerable population (Cozzolino, 2023; Silva et al., 2024).

Ultimately, this review emphasizes the need for a holistic and patient-centered approach to managing Cushing's syndrome. Effective treatment of this condition requires a comprehensive understanding of its pathophysiological mechanisms, individualized patient assessment, and personalized therapeutic approach. By integrating the latest scientific advances and promoting collaboration among various medical specialties, we can significantly improve clinical outcomes and the quality of life for patients with Cushing's syndrome (Herndon et al., 2021).

#### 4. FINAL CONSIDERATIONS

Given the challenges presented by Cushing's syndrome and its complications, as well as the additional ramifications introduced by the COVID-19 pandemic, it is evident that a multidisciplinary and patient-centered approach is essential for the effective management of this condition. This systematic review highlighted the complexity of Cushing's syndrome and its wide range of metabolic,

cardiovascular, and psychological complications, emphasizing the importance of early diagnosis, timely treatment, and continuous care to optimize clinical outcomes.

Additionally, the results underscore the need for preventive measures and adapted management strategies to protect patients with Cushing's syndrome during the COVID-19 pandemic. Coronavirus infection represents a significant risk for these patients, requiring a proactive approach to mitigate the adverse impacts of the disease. It is crucial to ensure continuous access to medical care, provide adequate education and support, and promote effective coping strategies to help patients deal with the challenges imposed by Cushing's syndrome and the pandemic.

Ultimately, this review highlights the need for ongoing collaboration among healthcare professionals, researchers, and patients to advance the understanding and management of Cushing's syndrome. By integrating the latest scientific advances, promoting public awareness, and implementing evidence-based intervention strategies, we can significantly improve clinical outcomes and the quality of life for patients affected by this complex condition. By addressing these challenges collaboratively and holistically, we can move towards a better understanding and treatment of Cushing's syndrome, thereby improving the well-being and health of affected individuals.

#### Author contributions

J.V.B.D.S., E.N.N., E.E.T.F., P.S.A.M., J.H.M.L. all contributed to the study design, data collection, analysis, and interpretation. J.V.B.D.S. and E.N.N. drafted the manuscript. J.H.M.L. supervised the project. All authors reviewed and approved the final manuscript.

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#### Competing financial interests

The authors have no conflict of interest.

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