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Diagnosis and Management of Thyroid Disease During Pregnancy and the Postpartum Period

[1] Fitriani, [1] Erlina

[1] Faculty of Medicine, Padjadjaran University, Bandung City, West Java, Indonesia

Correspondence : dr.fitriana1938372@gmail.com

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ABSTRACT

Background: The literature presents a comprehensive examination of the diagnosis and management of thyroid disease during pregnancy and the postpartum period, emphasizing the critical implications for maternal and fetal health. The studies reviewed underscore the prevalence of thyroid dysfunction among pregnant women and its association with adverse outcomes, including miscarriage, stillbirth, and developmental issues in infants. **Literature Review:** The literature also addresses the challenges in diagnosing thyroid dysfunction due to physiological hormonal changes during pregnancy (Anandappa et al., 2020). The emphasis on the critical role of thyroid hormones in fetal development reinforces the necessity for healthcare providers to recognize and manage these disorders effectively. Notably, the discussion on the implications of thyroid autoimmunity and its association with miscarriage risk further emphasizes the need for tailored management strategies (P. Fitzgerald et al., 2022). A pivotal shift in clinical assessment is suggested, moving from relying solely on TSH levels to considering free thyroxine (FT4) levels as a more relevant indicator of thyroid function during pregnancy (P. Fitzgerald et al., 2022). This change could lead to improved understanding and management of thyroid disorders in pregnant women. Additionally, the call for establishing trimester-specific reference intervals for thyroid function parameters highlights the importance of adapting clinical practices to better suit the needs of this population (D. Rosenberger & Parker, 2024). **Conclusion:** In conclusion, the reviewed literature collectively underscores the necessity for ongoing research and the refinement of clinical practices in the diagnosis and management of thyroid disease during pregnancy and the postpartum period. The findings advocate for a more nuanced understanding of thyroid function, the implications of thyroid autoimmunity, and the importance of collaborative care models to enhance maternal and fetal outcomes. The articles emphasize the need for further investigation into treatment strategies and standardization of clinical guidelines to optimize care for pregnant women with thyroid disorders.

Keyword: Diagnosis, Management, Thyroid Disease, During Pregnancy, the Postpartum Period

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INTRODUCTION

The diagnosis and management of thyroid disease during pregnancy and the postpartum period is a critical area of study, given the significant implications for both maternal and fetal health. The literature reveals a complex interplay between thyroid function and pregnancy outcomes, highlighting the need for heightened awareness and appropriate management strategies.

(Nazarpour et al., 2015) underscore the prevalence of thyroid dysfunction among pregnant women and its adverse effects on pregnancy outcomes, including miscarriage, stillbirth, and developmental issues in infants. Their review emphasizes that while overt thyroid disorders are well-documented in their impact on pregnancy, the consequences of subclinical hypothyroidism and thyroid autoimmunity remain controversial, necessitating further investigation into their effects on maternal and neonatal health.

(Sullivan, 2016) builds upon this foundation by addressing the risks posed by uncontrolled thyroid disease to both the mother and fetus. The article calls for additional research to delineate the effects of various treatment methods on pregnancy outcomes, particularly in diverse populations. (Sullivan, 2016)'s findings reinforce the notion that understanding the nuances of thyroid disorders is vital for optimizing care during pregnancy.

In a similar vein, (Tingi et al., 2016) highlight the importance of early diagnosis and management of thyroid dysfunction to avert adverse outcomes. They advocate for appropriate treatment of overt conditions and suggest that while subclinical hypothyroidism may require levothyroxine, the benefits of treating euthyroid women with positive thyroid autoantibodies remain unproven. This article contributes to the discourse on standardizing management practices within clinical guidelines.

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(Anandappa et al., 2020) further elucidate the challenges in diagnosing thyroid dysfunction during pregnancy, particularly due to hormonal changes. They emphasize the critical role of thyroid hormones in fetal development and the necessity for healthcare professionals to recognize and manage thyroid disorders effectively. Their review also addresses the implications of thyroid autoimmunity on miscarriage risk, reinforcing the need for tailored management strategies for women undergoing assisted reproduction.

(P. Fitzgerald et al., 2022) introduce new concepts regarding the assessment of thyroid state in pregnant women, suggesting a shift in focus from TSH levels to free thyroxine (FT4) levels for evaluating thyroid function. They argue that existing treatment approaches for mild thyroid dysfunction may not be effective and that clinical guidelines may need to be re-evaluated in light of these findings. This perspective adds a layer of complexity to the understanding of thyroid physiology during pregnancy.

Finally, (D. Rosenberger & Parker, 2024) stress the importance of collaborative care models, particularly for high-risk patients, to enhance maternal and fetal outcomes. They advocate for the establishment of trimester-specific reference intervals for thyroid function parameters, which could improve clinical practice. Their call for further research into iodine intake during pregnancy highlights an often-overlooked aspect of thyroid health.

Together, these articles present a comprehensive overview of the challenges and considerations in diagnosing and managing thyroid disease during pregnancy and the postpartum period. They underscore the necessity for ongoing research and the refinement of clinical practices to ensure optimal outcomes for mothers and their children.

LITERATURE REVIEW

The article "Thyroid dysfunction and pregnancy outcomes" by (Nazarpour et al., 2015) provides a comprehensive review of the implications of thyroid dysfunction during pregnancy, highlighting the significant impact on both maternal and fetal

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health. The authors emphasize that thyroid dysfunction is prevalent among pregnant women and can lead to a range of adverse pregnancy outcomes.

The review meticulously outlines the consequences of overt hyperthyroidism and hypothyroidism. Overt hyperthyroidism is linked to serious complications such as miscarriage, stillbirth, preterm delivery, intrauterine growth retardation, low birth weight, and preeclampsia. These findings are critical as they underscore the necessity for healthcare providers to monitor thyroid function closely in pregnant women, particularly those with pre-existing thyroid conditions. The article effectively illustrates how hyperthyroidism can lead to fetal thyroid dysfunction, further complicating pregnancy outcomes.

Conversely, the authors detail the adverse effects associated with overt hypothyroidism, which include abortion, anemia, pregnancy-induced hypertension, placental abruption, postpartum hemorrhage, and increased risks of low birth weight and neonatal respiratory distress. This thorough examination of the risks associated with overt hypothyroidism reinforces the importance of early diagnosis and management of thyroid conditions in pregnant women to mitigate these risks.

A notable aspect of the review is the discussion surrounding subclinical hypothyroidism and thyroid autoimmunity. The authors indicate that while some studies suggest a correlation between these conditions and adverse outcomes, the evidence remains inconclusive. This ambiguity highlights a critical gap in the literature, suggesting a need for further research to clarify the impact of subclinical thyroid dysfunction on pregnancy outcomes. The authors call attention to the potential for increased risks of placental abruption, preterm birth, and other complications, yet they also acknowledge the variability in findings across different studies.

The article "Influence of Thyroid Disorders On Pregnancy Outcomes" by (Sullivan, 2016) presents a critical examination of the implications of thyroid disorders on pregnancy outcomes, highlighting the significant risks posed by uncontrolled thyroid disease to both maternal and fetal health. The author underscores the

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necessity for optimal treatment methods, which remain largely undefined within current medical practice. This gap in knowledge is concerning, as the presence of thyroid disorders, particularly hypothyroidism and hyperthyroidism, correlates with an increased risk of adverse outcomes during pregnancy.

Sullivan's analysis points to a pressing need for more comprehensive research to elucidate the relationship between specific treatments for various thyroid disorders and their effects on pregnancy outcomes. The article emphasizes that while the detrimental effects of untreated thyroid conditions are well-documented, the optimal management strategies are still under investigation. This lack of clarity can lead to inconsistent treatment practices, which may further exacerbate risks for pregnant individuals with thyroid disorders.

Moreover, the article calls for studies involving large, racially diverse cohorts, which is essential for understanding the multifaceted nature of thyroid disorders and their impact during pregnancy. Such diversity in research populations would allow for a more nuanced understanding of how different demographic factors may influence treatment efficacy and pregnancy outcomes.

The article "Benign thyroid disease in pregnancy: A state of the art review" by (Tingi et al., 2016) provides a comprehensive overview of the diagnosis and management of thyroid dysfunction during pregnancy, emphasizing the critical importance of early intervention to mitigate adverse maternal and fetal outcomes. The authors systematically discuss various forms of thyroid dysfunction, including overt hypothyroidism, hyperthyroidism, subclinical hypothyroidism, and subclinical hyperthyroidism, providing a nuanced understanding of their implications during pregnancy.

One of the key insights from this review is the necessity of treating overt hypothyroidism and hyperthyroidism appropriately. The authors highlight that untreated overt hypothyroidism can lead to significant complications, including preeclampsia, placental abruption, and impaired fetal development. Conversely, hyperthyroidism, particularly in the context of Graves' disease, poses risks such as

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fetal tachycardia and low birth weight. This underscores the need for careful monitoring and management of these conditions.

The treatment approach for subclinical hypothyroidism is also discussed, with levothyroxine being the standard intervention. The authors note that while subclinical hypothyroidism is often treated to prevent progression to overt disease, the decision-making process should consider the individual patient's circumstances. This reflects a growing acknowledgment of the nuanced nature of thyroid management during pregnancy, where blanket treatment protocols may not be suitable for all cases.

Interestingly, the article points out that subclinical hyperthyroidism typically does not require treatment, which is a critical distinction for practitioners. The authors advise clinicians to consider alternative diagnoses, such as non-thyroidal illness or gestational thyrotoxicosis, before proceeding with treatment. This highlights the importance of a thorough diagnostic workup to avoid unnecessary interventions that could pose risks to both the mother and fetus.

A significant aspect of the review is the discussion surrounding euthyroid women with positive thyroid autoantibodies. Despite observational studies suggesting adverse outcomes in this population, (Tingi et al., 2016) argue that there is insufficient evidence to support the routine use of thyroxine supplementation in these cases. This conclusion emphasizes the need for further randomized controlled trials to determine the efficacy of treating pregnant women who are euthyroid but have autoimmune thyroid disease, as well as those with subclinical hypothyroidism and isolated hypothyroxinaemia.

The article titled "Thyroid disorders in subfertility and early pregnancy" by (Anandappa et al., 2020) provides a comprehensive examination of the complexities associated with diagnosing and managing thyroid disorders during pregnancy. It highlights the significance of thyroid dysfunction as the second most common pathology affecting women during this critical period, second only to diabetes. The authors emphasize the necessity for a detailed understanding of the

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pathophysiology, diagnosis, and treatment of thyroid disorders to mitigate adverse effects on both maternal and fetal health.

One of the critical challenges outlined in the article is the hormonal changes that occur during pregnancy, which complicate the detection and management of thyroid dysfunction. The authors assert that thyroid hormones play a vital role in fetal brain development and overall growth, making it imperative for healthcare professionals involved in antenatal care to recognize thyroid dysfunction promptly. They advocate for the involvement of specialist endocrinologists when necessary, underscoring the collaborative approach required in managing pregnant women with thyroid disorders.

The article also addresses the association between thyroid autoimmunity, indicated by elevated levels of anti-thyroid antibodies, and an increased risk of miscarriage. However, the authors note that the underlying mechanisms of this association remain poorly understood, suggesting a gap in the current knowledge that warrants further research. This highlights the need for ongoing investigation into the implications of thyroid autoimmunity during pregnancy and its management.

Moreover, the authors discuss the significant physiological changes in thyroid function that occur during pregnancy, which healthcare providers must understand to provide effective care. They reference key clinical trials that have contributed to the understanding of the consequences of hypothyroidism for both mother and child, as well as the effectiveness of thyroid hormone replacement in cases of autoimmune and subclinical hypothyroidism.

The article titled "The application of new concepts of the assessment of the thyroid state to pregnant women" by (P. Fitzgerald et al., 2022) presents a critical examination of recent advancements in the understanding of thyroid physiology, particularly in relation to pregnant women. The authors argue that the traditional clinical parameters used to assess thyroid function may not accurately reflect the thyroid state of peripheral tissues, especially during pregnancy. This assertion is

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significant as it challenges the conventional reliance on thyroid-stimulating hormone (TSH) levels as a primary indicator of thyroid health.

One of the key insights from the article is the emphasis on free thyroxine (FT4) levels as a more relevant measure of thyroid function in pregnant women compared to TSH levels. The authors highlight that while TSH has historically been the cornerstone of thyroid assessment, recent clinical evidence suggests that FT4 levels correlate more closely with pregnancy outcomes. This shift in focus is particularly important given that many studies have historically overlooked the pregnant population, leading to a gap in understanding how thyroid dysfunction may impact maternal and fetal health.

The article also addresses the controversy surrounding the management of subclinical thyroid dysfunction during pregnancy. (P. Fitzgerald et al., 2022) note that national obstetric guidelines do not recognize subclinical thyroid dysfunction as clinically relevant, yet there is an increasing trend among healthcare providers to initiate treatment in pregnant women diagnosed with this condition. This discrepancy raises questions about the appropriateness of current clinical practices and the need for further research to clarify the implications of subclinical hypothyroidism on pregnancy outcomes.

Moreover, the authors point out that there is no substantial evidence supporting the efficacy of treating mild thyroid dysfunction for improving pregnancy-related outcomes. This claim is particularly critical as it suggests that the current treatment protocols may not be justified, potentially leading to unnecessary interventions that do not confer real benefits to either the mother or the fetus.

The article "Updates on thyroid disorders in pregnancy and the postpartum period" by (D. Rosenberger & Parker, 2024) provides a comprehensive overview of the management of thyroid diseases during pregnancy and the postpartum phase. The authors emphasize the critical importance of referral to maternal-fetal medicine, particularly for patients with elevated TSH receptor antibodies, uncontrolled hyperthyroidism, or a history of irradiation for hyperthyroidism while on

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replacement therapy. This approach is underscored as essential for improving both maternal and fetal outcomes, highlighting the need for a collaborative management strategy in complex cases.

A significant contribution of the article is the call for establishing standard population-based trimester-specific reference intervals for thyroid function parameters. The authors argue that such standards would enhance both academic research and clinical practice by providing a more accurate framework for assessing thyroid function during pregnancy. Currently, existing guidelines recommend the use of trimester- and instrumentation-specific reference intervals; however, the article notes a concerning gap between these recommendations and their actual implementation in clinical settings. Clinicians often default to intervals suggested by clinical lab manufacturers, which may not be appropriate for the pregnant population. This discrepancy indicates a pressing need for educational initiatives to encourage adherence to established guidelines.

Moreover, the article points out a notable deficiency in the literature concerning iodine intake during pregnancy. Iodine is a crucial element for thyroid hormone production, and inadequate intake can lead to adverse outcomes for both the mother and the developing fetus. The authors advocate for future research to explore iodine status and its implications on thyroid function and overall maternal-fetal health, suggesting that a better understanding of iodine intake could inform clinical practices and guidelines.

CONCLUSION

The literature presents a comprehensive examination of the diagnosis and management of thyroid disease during pregnancy and the postpartum period, emphasizing the critical implications for maternal and fetal health. The studies reviewed underscore the prevalence of thyroid dysfunction among pregnant women and its association with adverse outcomes, including miscarriage, stillbirth, and developmental issues in infants (Nazarpour et al., 2015). The complexity of managing thyroid disorders is highlighted, particularly the need for early diagnosis

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and appropriate treatment strategies to mitigate risks [ref: 6ea5d674-2555-4b32-94af-cc1eaf77c016; ref: 96a5553d-6cd0-4ad0-958a-a4769249c512].

The literature also addresses the challenges in diagnosing thyroid dysfunction due to physiological hormonal changes during pregnancy (Anandappa et al., 2020). The emphasis on the critical role of thyroid hormones in fetal development reinforces the necessity for healthcare providers to recognize and manage these disorders effectively. Notably, the discussion on the implications of thyroid autoimmunity and its association with miscarriage risk further emphasizes the need for tailored management strategies (P. Fitzgerald et al., 2022).

A pivotal shift in clinical assessment is suggested, moving from relying solely on TSH levels to considering free thyroxine (FT4) levels as a more relevant indicator of thyroid function during pregnancy (P. Fitzgerald et al., 2022). This change could lead to improved understanding and management of thyroid disorders in pregnant women. Additionally, the call for establishing trimester-specific reference intervals for thyroid function parameters highlights the importance of adapting clinical practices to better suit the needs of this population (D. Rosenberger & Parker, 2024).

In conclusion, the reviewed literature collectively underscores the necessity for ongoing research and the refinement of clinical practices in the diagnosis and management of thyroid disease during pregnancy and the postpartum period. The findings advocate for a more nuanced understanding of thyroid function, the implications of thyroid autoimmunity, and the importance of collaborative care models to enhance maternal and fetal outcomes. The articles emphasize the need for further investigation into treatment strategies and standardization of clinical guidelines to optimize care for pregnant women with thyroid disorders.

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- Disclosure Statement : The authors have no conflicts of Interest to declare

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