

THE RELEVANCE OF ANEURYSMATIC SUBARACHNOID HEMORRHAGE DURING PREGNANCY

Richard Almeida Baiense Mellis

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<https://lattes.cnpq.br/2312121042832209>

João Guilherme Menezes Sousa Santos

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<https://lattes.cnpq.br/8807782717841817>

Jorge Rhailan Pacifico Sierau

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<http://lattes.cnpq.br/0244453210842373>

Sidiney Augusto Silva Passos

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<https://lattes.cnpq.br/5146218112851960>

Ítalo Felipe Bomfim Carneiro Leite

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<http://lattes.cnpq.br/2648852224841307>

Pedro Arthur Monteiro Freitas

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<https://lattes.cnpq.br/3803256704591058>

Caroline Souza dos Santos Trindade

Universidade Federal de Sergipe (UFS)

Aracaju-Sergipe

<https://lattes.cnpq.br/9187237991956530>

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Lucas Amorim Mirindiba Bonfim
Universidade Federal de Sergipe (UFS)
Aracaju-Sergipe
<http://lattes.cnpq.br/0918381520446579>

Iuri Soares de Macedo
Universidade Federal de Sergipe (UFS)
Aracaju-Sergipe
<https://lattes.cnpq.br/1088959064430115>

Gustavo Dias Santos
Universidade Federal de Sergipe (UFS)
Aracaju-Sergipe
<https://lattes.cnpq.br/0018473053977237>

Jonatas Santos Andrade
Universidade Federal de Sergipe (UFS)
Aracaju-Sergipe
<http://lattes.cnpq.br/9908760843265450>

Rodrigo Welste de Souza Medeiros
Universidade Federal de Sergipe (UFS)
Aracaju-Sergipe
<https://lattes.cnpq.br/4439251300342994>

Abstract: **Introduction:** Aneurysmal subarachnoid hemorrhage (SAH) is an acute neurological condition that requires immediate intervention and intensive multidisciplinary monitoring. During pregnancy, SAH due to aneurysm rupture presents therapeutic and clinical management challenges, requiring personalized approaches. **Methodology:** An integrative review of the literature was carried out in PubMed, selecting ten articles from the last ten years (2014-2024) using the descriptor “aneurysmal subarachnoid hemorrhage and emergency intervention and pregnancy” in DeCS/MeSH. **Inclusion criteria:** studies with pregnant patients with SAH and its management. **Exclusion criteria:** irrelevant studies, theses and books. **Results:** Aneurysmal SAH during pregnancy is clinically challenging. Documented cases occur mainly in pregnant women aged 30 or over, and can occur in any trimester, but more frequently in the third. Multidisciplinary approaches are essential to improve maternal-fetal care and reduce morbidity. Diagnostic imaging, such as CT and MRI, is generally safe in the second and third trimesters. Angiograms, necessary to detect aneurysms, require careful assessment of radiation risks. Surgical approaches such as clipping and endovascular embolization are recommended, with preference for endovascular intervention. Cesarean section is generally favored in cases of ruptured aneurysms. **Conclusion:** The management of SAH during pregnancy requires a multidisciplinary and individualized approach. Current guidelines, while helpful, have limitations. Systematically reviewing recommendations and integrating updated evidence are essential to improving maternal-fetal outcomes.

Keywords: Aneurysm, intracranial, bleeding.

INTRODUCTION

Aneurysmal subarachnoid hemorrhage (SAH) is an acute neurological condition that requires immediate medical intervention and requires intense multidisciplinary follow-up and monitoring in an intensive care unit. During the gestational period, SAH due to aneurysm rupture represents a significant challenge in terms of therapeutic approach and clinical management. This study's main objective is to address the complexity of the clinical management of aneurysmal SAH during the gestational period, highlighting the need for immediate and personalized intervention. (BEIGHLEY et al. 2021, SOMA-PILLAY et al. 2016)

Due to the limited incidence of documented cases, the absence of consolidated treatment guidelines, we seek to analyze the effectiveness of different management strategies and potential therapeutic algorithms. Consequently, treatment is often personalized, taking into consideration, different management strategies and potential therapeutic algorithms. During pregnancy, it is crucial to meticulously consider physiological changes, especially those that impact hemodynamic stability and cerebral autoregulation. These must be carefully considered during initial and subsequent treatment of the identified risk factors, which include: advanced age, smoking and hypertension. (BEIGHLEY et al. 2021)

METHODOLOGY

This is an integrative literature review using the Pubmed library. "10" articles were selected for the proposed topic, out of a total of "21". The descriptor used in English was "aneurysmal subarachnoid hemorrhage and emergency intervention and pregnancy" in DeCS/MeSH. Articles were filtered from the last 10 years (2014 – 2024). Inclusion criteria are (1) studies in patients with subarachnoid

hemorrhage during pregnancy; (2) the management of subarachnoid hemorrhage in pregnancy. The exclusion criteria are based on studies that are not relevant to the proposed topic, doctoral thesis and book texts.

THEORETICAL FOUNDATION

Aneurysmal subarachnoid hemorrhage (SAH) during pregnancy is a clinically challenging and infrequent condition, with intracranial aneurysms being rarely observed in this context. Despite this, occurrences have been documented in women of different age groups, with a higher prevalence in pregnant women aged approximately 30 years or older. Aneurysmal rupture during pregnancy can occur in any trimester, being observed more frequently in the third trimester (FRITZSCHE et al. 2017, BEIGHLEY et al. 2021) therefore, it is essential to emphasize the importance of a multidisciplinary approach involving specialties such as anesthesiology, obstetrics, neuroradiology and neurosurgery to improve care for the maternal-fetal binomial and mitigate the risks of morbidity (BEIGHLEY et al. 2021).

The decision on selection and choice between treatments for aneurysmal subarachnoid hemorrhage during pregnancy is crucial, aiming to minimize the risk of morbidity for the mother and fetus. Clinical treatments, based on diagnostic imaging, such as computed tomography, magnetic resonance imaging and cerebral angiogram, are essential to mitigate the risks associated with SAH due to aneurysm rupture. (FRITZSCHE et al. 2017, HIRONAKA et al. 2020, XIE et al. 2021)

In terms of diagnostic imaging, computed tomography (CT) and magnetic resonance imaging (MRI) during pregnancy, especially in the 2nd or 3rd trimester, is generally considered safe for the fetus and is an initial option for evaluating brain injuries in women. pregnant women with acute neurological symptoms and radiation risks are considered low.

(AMERICAN COLLEGE OF RADIOLOGY et al. 2018) However, the standard cerebral angiogram to detect intracranial aneurysms involves exposure to radiation during the exams, which requires a careful assessment of risks and benefits, the use of iodinated contrast media is another concern in cerebral angiography because contrast crosses the placenta and is excreted in the amniotic fluid, making it necessary to consider its effects on the fetus. (XIE et al. 2021, FRITZSCHE et al. 2017, CHANSAKUL et al. 2017)

After confirming the presence of aneurysmal SAH through imaging, a surgical approach is highly recommended to reduce risks. Options include surgical clipping and endovascular coiling, with the latter often preferred for intracranial aneurysms ruptured during pregnancy. Embolization is also considered as a therapeutic alternative. (FRITZSCHE et al. 2017, HIRONAKA et al. 2020, XIE et al. 2021)

Definitive surgical treatment of SAH due to aneurysm rupture has demonstrated greater efficacy in reducing fetal mortality compared to late postpartum or conservative management in pregnant women. Therefore, endovascular treatment or open intervention is recommended as soon as possible to mitigate the risks to both the patient and the fetus. (BEIGHLEY et al. 2021, DULEY, et al. 2019, MOON, et al. 2017)

The choice between cesarean section and vaginal delivery in patients with gestational SAH generally favors cesarean section, especially in cases of ruptured intracranial aneurysms, due to the associated manner of anesthesia delivery. Individualized factors, such as the gestational age of the fetus, the neurological status of the mother, and the location of the aneurysm, must be carefully considered at the beginning of treatment. (FRITZSCHE et al. 2017, HIRONAKA et al. 2020, XIE et al. 2021, ROBBA, et al. 2016)

Treatment management, although individualized, is challenging due to the complexity of the cases, the analysis of incomplete guidelines and the implementation of already standardized procedures. (FRITZSCHE et al. 2017, HIRONAKA et al. 2020, XIE et al. 2021) Therefore, the precise and agile decision in the management of SAH during pregnancy is facilitated by a therapeutic algorithm. This algorithm takes into consideration, the gestational age of the fetus, exposure to X-rays and the location of the aneurysm, helping to choose between the available treatment options, as well as the moment and mode of delivery. (BEIGHLEY et al. 2021)

FINAL CONSIDERATIONS OR CONCLUSION

Given the complexity and rarity of subarachnoid hemorrhage during pregnancy, a multidisciplinary and individualized approach is essential for the effective management of this condition. The available guidelines offer guidance on diagnostic imaging treatment, selection of the type of surgery and choices related to childbirth, however, they all have limitations. In this study, we carried out a systematic review of the current literature, focusing on the recommendations available in the literature for the clinical management of aneurysmal SAH during pregnancy, taking into consideration, the rarity of this condition and the risk of mortality for both the mother and the fetus. The integration of updated evidence and consideration of the individual characteristics of each patient are essential to guide therapeutic decisions and improve maternal-fetal outcomes. Therefore, it is imperative to continue research and improve guidelines for the treatment of SAH due to aneurysm rupture during pregnancy, aiming to provide the best possible care for pregnant women and their fetuses.

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