OPEN ACCESS

GAVIN PUBLISHERS

Journal of Anesthesia and Surgical Reports

Aldergård A and Henningsson R. J Anesth Surg Rep: JASR-103.

DOI: 10.29011/JASR-103.100003

Case Report

Management of Women with Hereditary Angioedema During Pregnancy and Delivery

Åsa Aldergård, Ragnar Henningsson*

Department of Anesthesiology, Central Hospital of Karlstad, Sweden

***Corresponding author:** Ragnar Henningsson, Department of Anesthesiology, Central Hospital of Karlstad, Sweden. Tel: +460708707524; Email: Ragnar.Henningsson@liv.se

Citation: Aldergård A, Henningsson R (2018) Management of Women with Hereditary Angioedema During Pregnancy and Delivery. J AnesthSurgRep: JASR-103. DOI: 10.29011/JASR-103.100003

Received Date: 04 April, 2018; **Accepted Date:** 25 April, 2018; **Published Date:** 03 May, 2018

Abstract

Hereditary Angioedema (HAE) is a rare but potentially life-threatening condition. The majority of patients with HAE experience a worsening of symptoms and attack-frequency during pregnancy. This case report describes a woman with insulin-treated gestational diabetes and HAE type 1 since many years, who was planned for cesarean section. This is to our knowledge, the first described case in elective spinal anesthesia.

Introduction

Hereditary Angioedema (HAE) is an autosomal dominant genetic disorder. It can be subdivided into four types 1-4. Type 1 and 2 are caused by a mutation in the gene that makes CI esterase inhibitor protein (C1-INH), while type 3 is often due to a mutation of the factor XII gene. Type 4 is a hereditary angioedema of unknown origin (U-HAE) [1,2]. Type 1 has low levels of C1-INH and type 2 decreased function of C1-INH. Pregnancy can affect HAE in different ways. The majority of patients with HAE type 1 or 2 experience a worsening of symptoms and attack-frequency during pregnancy, but some have a relief of symptoms or no change at all. Abdominal symptoms are more common. HAE type 3 manifests mainly during periods of increased estrogen-exposure, i.e. pregnancy, combined contraceptives therapy or hormone replacement.

Case Report

The patient herein gave her consent for inclusion in this report. We present a woman in 3rd trimester, with insulin-treated gestational diabetes and HAE type 1 since many years, who was planned for cesarean section at Karlstad Central Hospital. During the first half of pregnancy she suffered from several attacks, mostly with symptoms from abdomen, rectum and legs. She required medical treatment with human plasma-derived C1-INH concentrate 2-3 times a week. Second half of pregnancy was less severe, which she considered derived from less stress due to being on sick leave during this period.

Elective cesarean section was performed in week 38+5 due to breech presentation. She received 1500 E of pdh-C1INH one hour before start of surgery. The operation was performed in spinal anesthesia and went uneventful.

Our patient stayed a prolonged time in the recovery unit for extra surveillance. About an hour after the operation she experienced some hoarseness and a hint of swelling of her lips, but the symptoms declined spontaneously and needed no further treatment. She stayed at the hospital for three days without any further symptoms. The plan was not to breastfeed and she received karbegolin the first day post-partum.

Discussion

Based on this case, a literature study of HAE and pregnancy was performed by searching PubMed of articles in English from 1999 to January 2017. 31 articles were found, 16 case-reports, 7 review-articles and 8 observational studies [3-33]. No randomized-controlled studies were found.

Hereditary Angioedema (HAE) is a rare but potentially life-threatening condition. It is an autosomal dominantly inherited disease with a quantitative decrease of C1-inhibitor (type 1) or normal levels of C1-inhibitor, but a functional defect (type 2). These conditions lead to an excessive production of bradykinin, which is a potent inducer of vasodilatation and vascular permeability. There is also a third type of hereditary angioedema (nC1-INH-HAE) with normal levels and function of C1-inhibitor, where an abnormality

in Factor XII probably leads to inappropriate activation of the kinin forming cascade. Exacerbation from endogenous or exogenous estrogen exposure is particularly common in this form, but female sex hormones appears to play an important role in all HAE. The fourth form of HAE is of unknown origin. Mutations of the plasminogen gene and of the angiopoietin-1 gene (ANGPT1) are described in even two new types of hereditary angioedema [34,35].

Other trigging factors for HAE are mental stress or mechanical trauma, such as injury, surgical procedures or repetitive work [5]. Pregnancy has multiple influences on the disease with both mechanical (due to the growing fetus) and hormonal effects and sometimes a mental stress. Apart from that there is a big variety of both severity of symptoms and attack frequency [4,6,7,20,21]. Pregnancy might be worsening the course of HAE, improve or not affect at all, but he majority of women experience an increase in attack rate during pregnancy [4,6,20].

In a retrospective study by Czaller [6] the symptoms and frequency of HAE was similar for each subsequent pregnancy in 78% of women, and the same conclusion was drawn by Bouilliet [22], but for some women the course of the disease differs a lot between pregnancies. In a case report by Montinaro [7] two homozygous twins with HAE are described with a very variable attack frequency during pregnancy. This report underlies that the clinical expression of the disease is variable during pregnancy in spite of an identical genetic background.

Localization of symptoms also seems to change during pregnancy. The abdominal region was the most common localization of oedema [6,20] and might be a differential diagnosis challenge. There are discrepancies whether in which trimester the symptoms are most severe [4,6,20,21]. The majority of drugs used for prophylaxis or treatment of HAE can´t be used during pregnancy and lactation, but human plasma-derived C1-INH (pdh-C1INH) concentrate has been used for several years and seems to be an effective and safe alternative, although controlled studies are lacking [3,4,6,7,11-13,16,20,23-29]. If this is not available tranexamic-acid or virally inactivated fresh frozen plasma can be considered [3,25,26,30].

Vaginal delivery is preferred to avoid provoking a life-threatening attack by endotracheal intubation or surgical injury. HAE attacks are uncommon during vaginal delivery although it involves substantial mechanical trauma [4,6,20-22]. pdh-C1INH prophylaxis can be considered, especially in instrumental deliveries or for patients with severe symptoms and should at least be immediately available in the delivery room [3,11]. Close follow-up for at least 72 hours after delivery is recommended and the patient should be informed of increased risk of post-partum swelling, when going home [3,5,11]. Regional anesthesia is strongly recommended for cesarean section since intubation can provoke a life-threatening laryngeal edema. pdh-C1INH-prophylax is recommended before start of surgery [3,5,11].

Funding: None

Conflict of Interest: None

References

1. Wu MA, Perego F, Zanichelli A, Cicardi M (2016) Angioedema Phenotypes: Disease Expression and Classification. Clin Rev Allergy Immunol 51: 162-169.
2. Cicardi M, Aberer W, Banerji A, Bas M, Bernstein JA, Bork K, et al. (2014) Classification, diagnosis, and approach to treatment for angioedema: consensus report from the Hereditary Angioedema International Working Group. Allergy 69: 602-616.
3. Caballero T, Farkas H, Bouillet L, Bowen T, Gompel A, et al. (2012) International consensus and practical guidelines on the gynecologic and obstetric management of female patients with hereditary angioedema caused by C1 inhibitor deficiency. J Allergy Clin Immunol 129: 308-320.
4. González-Quevedo T, Larco JI, Marcos C, Guilarte M, Baeza ML, et al. (2016) Management of Pregnancy and Delivery in Patients With Hereditary Angioedema Due to C1 Inhibitor Deficiency. J Investig Allergol Clin Immunol 26:161-7.
5. Banerji A, Riedl M (2016) Managing the female patient with hereditary angioedema. Womens Health (Lond) 12: 351-361.
6. Czaller I, Visy B, Csuka D, Füst G, Tóth F, et al. (2010) The natural history of hereditary angioedema and the impact of treatment with human C1-inhibitor concentrate during pregnancy: a long-term survey. Eur J Obstet Gynecol Reprod Biol 152: 44-49.
7. Montinaro V, Castellano G (2010) Management of pregnancy and vaginal delivery by C1 inhibitor concentrate in two hereditary angioedema twins. Clin Immunol 136: 456-457.
8. Caliskaner Z, Ozturk S, Gulec M, Dede M, Erel F, et al. (2007) A successful pregnancy and uncomplicated labor with C1INH concentrate prophylaxis in a patient with hereditary angioedema. Allergol Immunopathol (Madr) 35: 117-119.
9. Nathani F, Sullivan H, Churchill D (2006) Pregnancy and C1 esterase inhibitor deficiency: a successful outcome. Arch Gynecol Obstet 274: 381-384.
10. Zanichelli A, Mansi M, Periti G (2015) Icatibant Exposure During Pregnancy in a Patient With Hereditary Angioedema. J Investig Allergol Clin Immunol 25: 447-449.
11. Caballero T, Canabal J, Rivero-Paparoni D, Cabañas R (2014) Management of hereditary angioedema in pregnant women: a review. Int J Womens Health 6: 839-848.
12. Soltanifar D, Afzal S, Harrison S, Sultan P (2014) Caesarean delivery in a parturient with type III hereditary angioedema. Int J Obstet Anesth 23: 398-399.
13. Farkas H, Veszeli N, Csuka D, Temesszentandrási G, Tóth F, et al. (2015) Management of pregnancies in a hereditary angioedema patient after treatment with attenuated androgens since childhood. J Obstet Gynaecol 35: 89-90.

14. Lawlor F (2014) Urticaria and angioedema in pregnancy and lactation. Immunol Allergy Clin North Am 34: 149-156.

15. Bouillet L, Gompel A (2013) Hereditary angioedema in women: specific challenges. Immunol Allergy Clin North Am 33: 505-511.

16. Chan W, Berlin N, Sussman GL (2013) Management of hereditary angioedema with C1□inhibitor concentrate during two successive pregnancies. Int J Gynaecol Obstet 120: 189-190.

17. Wingtin LN, Hardy F (1989) Epidural Block During Labour in Hereditary Angioneurotic Oedema. Obstetric Anesthesia Digest 9: 176.

18. Bouillet L (2010) Hereditary angioedema in women. Allergy Asthma Clin Immunol 6: 17.

19. Jose J, Zacharias J, Craig T (2016) Review of Select Practice Parameters, Evidence-Based Treatment Algorithms, and International Guidelines for Hereditary Angioedema. Clin Rev Allergy Immunol 51: 193-206.

20. Martinez-Saguer I, Rusicke E, Aygören-Pürsün E, Heller C, Klingebiel T, et al. (2010) Characterization of acute hereditary angioedema attacks during pregnancy and breast-feeding and their treatment with C1 inhibitor concentrate. Am J Obstet Gynecol 203: 131.e1-7.

21. Chinniah N, Katelaris CH (2009) Hereditary angioedema and pregnancy. Aust N Z J Obstet Gynaecol 49: 2-5.

22. Bouillet L, Longhurst H, Boccon-Gibod I, Bork K, Bucher C, et al. (2008) Disease expression in women with hereditary angioedema. Am J Obstet Gynecol 199: 484.e1-4.

23. Duvvur S, Khan F, Powell K (2007) Hereditary angioedema and pregnancy. J Matern Fetal Neonatal Med 20: 563-565.

24. Picone O, Donnadieu AC, Brivet FG, Boyer-Neumann C, Frémeaux-Bacchi V, et al. (2010) Obstetrical Complications and Outcome in Two Families with Hereditary Angioedema due to Mutation in the F12 Gene. Obstet Gynecol Int 2010: 957507.

25. Milingos DS, Madhuvrata P, Dean J, Shetty A, Campbell DM (2009) Hereditary angioedema and pregnancy: successful management of recurrent and frequent attacks of angioedema with C1-inhibitor concentrate, danazol and tranexamic acid - a case report. Obstet Med 2: 123-125.

26. McGlinchey PG, Golchin K, McCluskey DR (2000) Life-threatening laryngeal oedema in a pregnant woman with hereditary angioedema. Ulster Med J 69: 54-57.

27. Gorman PJ (2008) Hereditary angioedema and pregnancy: a successful outcome using C1 esterase inhibitor concentrate. Can Fam Physician 54: 365-366.

28. Lovsin B, Guzej Z, Vok M, Kramar I, Ravnikar J (1999) C-1 esterase inhibitor prophylaxis for delivery in hereditary angioedema. J Obstet Gynaecol 19: 537-538.

29. Hermans C (2007) Successful management with C1-inhibitor concentrate of hereditary angioedema attacks during two successive pregnancies: a case report. Arch Gynecol Obstet 276: 271-276.

30. Hsieh FH, Sheffer AL (2002) Episodic swelling in a pregnant woman from Bangladesh: evaluation and management of angioedema in pregnancy. Allergy Asthma Proc 23: 157-161.

31. Fox J, Vegh AB, Martinez-Saguer I, Wuillemin WA, Edelman J, et al. (2017) Safety of a C1-inhibitor concentrate in pregnant women with hereditary angioedema. Allergy Asthma Proc 38: 216-221.

32. Baker JW, Craig TJ, Riedl MA, Banerji A, Fitts D, et al. (2013) Nanofiltered C1 esterase inhibitor (human) for hereditary angioedema attacks in pregnant women. Allergy Asthma Proc 34: 162-169.

33. Farkas H, Kőhalmi KV, Veszeli N, Tóth F, Varga L (2016) First report of icatibant treatment in a pregnant patient with hereditary angioedema. J Obstet Gynaecol Res 42: 1026-1028.

34. Bork K, Wulff K, Steinmüller-Magin L, Braenne I, Staubach-Renz P, et al. (2018) Hereditary angioedema with a mutation in the plasminogen gene. Allergy 73: 442-450.

35. Bafunno V, Firinu D, D'Apolito M, Cordisco G, Loffredo S, et al. (2018) Mutation of the angiopoietin-1 gene (ANGPT1) associates with a new type of hereditary angioedema. J Allergy Clin Immunol 141: 1009-1017.