INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN CHEMISTRY AND PHARMACEUTICAL SCIENCES
(p-ISSN: 2348-5213: e-ISSN: 2348-5221)
www.ijcrcps.com
(A Peer Reviewed, Referred, Indexed and Open Access Journal)
DOI: 10.22192/ijcrcps Coden: IJCROO(USA) Volume 10, Issue 8 - 2023

Review Article

DOI: http://dx.doi.org/10.22192/ijcrcps.2023.10.08.002

Deep vein thrombosis in pregnancy: A review of prevalence and risk factors

*Emmanuel Ifeanyi Obeagu[1], Getrude Uzoma Obeagu[2] and Frances Ugonne Ogunnaya[3]
[1]Department of Medical Laboratory Science, Kampala International University, Uganda.
[2]School of Nursing Science, Kampala International University, Uganda.
[3]Department of Internal Medicine, Newark Beth Israel Medical Center, 201Lyons Avenue, Newark NJ.
*Corresponding author: Emmanuel Ifeanyi Obeagu, Department of Medical Laboratory Science, Kampala International University, Uganda, emmanuelobeagu@yahoo.com, 0000-0002-4538-0161

Abstract

Because of the potential complications, deep vein thrombosis (DVT) during pregnancy is a serious issue. Although there are variations among different populations, it is thought that one in a thousand pregnancies will experience DVT during pregnancy. Pregnancy-related physiological changes, such as hypercoagulability and multiparity, as well as advanced maternal age, maternal obesity, a history of DVT, and other risk factors can all contribute to the development of DVT. Pulmonary embolism (PE), post-thrombotic syndrome (PTS), and unfavorable pregnancy outcomes, such as preterm birth, low birth weight, and stillbirth, are complications connected to DVT in pregnancy. To avoid PE and lessen the risk of long-term complications like PTS, early identification and prompt management of DVT are crucial.

Keywords: deep vein thrombosis, DVT, pregnancy, prevalence, risk factors

Introduction

The development of blood clots in deep veins is a sign of deep vein thrombosis (DVT), a potentially fatal condition that typically affects the legs or pelvis [1]. Due to physiological changes in the mother's body during pregnancy, the risk of DVT is significantly increased [2]. For effective prevention, early diagnosis, and appropriate management of this condition, it is essential to comprehend the prevalence and risk factors linked to DVT in pregnancy [3].

Many studies have looked into the prevalence of DVT during pregnancy, and the results show that rates vary between populations [4].

These studies suggest that the prevalence of DVT during pregnancy is roughly 1 in 1000 pregnancies [5].

Significant risk factors for DVT during pregnancy have been found to include a variety of maternal factors [6]. DVT risk is increased with older maternal ages, according to research [7]. Another important risk factor for DVT during pregnancy has been identified as maternal obesity [8]. Additionally, women who have experienced DVT in the past are more likely to experience it again during future pregnancies [9]. The risk of DVT is raised by pregnancy-related factors as well [10]. Due to physiological changes during pregnancy, such as altered coagulation factors and increased levels of clotting factors, the condition of hypercoagulability is brought on [11].

There are between 0 and 2 cases of DVT for every 1,000 pregnancies, according to reports [12]. These estimates, however, may change based on the population examined and the diagnostic techniques employed. DVT in pregnancy is a rare occurrence, but because of the potential consequences, it needs to be managed carefully [13].

There are several known risk factors that can lead to the occurrence of DVT during pregnancy. One such risk factor is maternal age, with older mothers being more likely to develop DVT [14]. Due to increased venous stasis and altered coagulation factors, maternal obesity has also been identified as a significant risk factor for DVT in pregnancy [15].

Additionally, a well-known risk factor for recurrent DVT during pregnancy is a prior history of DVT [16]. Pregnancy-related DVT risk may also be influenced by other variables, such as inherited thrombophilias (genetic abnormalities that affect blood clotting) [17].

Pregnant women are more likely to develop deep vein thrombosis (DVT) due to the physiological changes that take place during pregnancy, including increased blood volume, hormonal changes, and changes in blood flow dynamics [18].

When determining individual risk profiles and putting effective preventive measures in place, healthcare providers must have a thorough understanding of the prevalence and risk factors of DVT in pregnancy. The prevalence and related complications of DVT during pregnancy can be decreased by identifying high-risk people and putting preventative measures in place like anticoagulant therapy, compression stockings, consistent exercise, and lifestyle changes [19].

DVT prevalence among pregnant women

According to various studies and populations, DVT is more common in pregnant women than not [20]. In comparison to the general population who are not pregnant, pregnancy has been linked to an increased risk of DVT in several studies [21].

To determine the prevalence of DVT during pregnancy, [21] performed a systematic review and meta-analysis. A total of 36,524,924 pregnancies from 48 studies were included in the study.In the 48 studies that made up the study, there were 36,524,924 pregnancies.A study found that about 1 in 1000 pregnancies overall experienced DVT during pregnancy.According to Clarkin [22], a retrospective study was carried out in the UK in 2003 and included 340,000 pregnancies. According to the study, venous thromboembolism, which includes DVT, occurs 18% of the time during pregnancy.

DVT Pregnancy Risk Factors

As risk factors for DVT in pregnancy, a number of maternal and pregnancy-related factors have been identified [23].

The identification of women who are more at risk and the implementation of suitable preventive measures can be aided by an understanding of these factors [24].

Some frequently mentioned risk factors include the following:

Age factors

AlShami and colleagues on advanced maternal age. According to [25], pregnant women who are older maternal age are more likely to experience DVT.

Leddy et al. discuss obesity. According to [26], maternal obesity is a significant risk factor for

DVT during pregnancy

DVT's prior history was described by White et al. [27] showed that women with a history of DVT are more likely to experience the condition during subsequent pregnancies.

Factors connected to pregnancy

Hypercoagulable State: The physiological changes that occur during pregnancy encourage a hypercoagulable state, raising the risk of DVT [28]. Greer and associates. (2012) talked about how pregnancy-related hormonal changes affect coagulation factors and the underlying mechanisms that underlie those effects [29].

Multiple parity: Ahmed et al. [30] discovered that compared to women who are only carrying one child, multiple pregnancies are linked to a higher risk of DVT.

DVT complications in pregnancy

The serious condition known as deep vein thrombosis (DVT) has been linked to serious pregnancy complications [31]. Through a thorough analysis of pertinent studies and research findings, this review of the literature aims to explore the complications related to DVT in pregnancy.

PE, or pulmonary embolism

DVT during pregnancy increases the possibility of pulmonary embolism, a condition that could be fatal [32]. The increased risk of PE in pregnant women with DVT has been highlighted in several studies [33].

The Post-Thrombotic Syndrome (PTS)

Chronic leg pain, swelling, and skin changes are symptoms of PTS, a long-term complication that can follow DVT [34]. An elevated risk of PTS development has been linked to pregnancy-related DVT.

A. Ginsberg and other people.403 pregnant women with DVT participated in a multicenter prospective study conducted by [35]. Within two years of the initial DVT event, 31% of the women reported having PTS, according to the study.

B. Prandoni and others. 371 women with a history of pregnancy-related DVT took part in a follow-up study conducted by [36]. They discovered that, over the course of a median follow-up of 5+/- 7 years, 20% of the women experienced PTS.

Adverse pregnancy outcomes

DVT during pregnancy has been linked to harmful outcomes for both the mother and the fetus:

A. Sultan and colleagues. [37] carried out a population-based cohort study with more than 400,000 pregnancies. According to their findings, compared to women who did not have DVT, pregnant women with DVT had a significantly increased risk of preterm birth, low birth weight, and stillbirth.

B.Ivasyk and colleagues. Over 1.6 million pregnancies were included in a sizable population-based cohort study conducted by [38-40]. Their findings suggested that pregnant women with a history of DVT were at an increased risk of placental abruption, preeclampsia, and gestational diabetes.

It's critical to comprehend these issues in order to detect DVT in pregnancy early, manage it properly, and prevent negative outcomes [41-52].It emphasizes how critical it is to put preventive measures in place, get diagnosed quickly, and use the best management techniques for pregnant women who are at risk for DVT [53-63].

Conclusion

Prevalence and risk factors for deep vein thrombosis, a serious pregnancy complication, should be carefully considered to ensure proper management.

Individual risk factors for pregnant women should be determined, and appropriate preventive measures should be taken. In order to minimize the negative effects linked to DVT during pregnancy, early diagnosis and prompt intervention are essential.

For effective prevention, early detection, and management of this condition, it is essential to understand the prevalence and risk factors linked to DVT in pregnancy.

Women who are pregnant and have risk factors should be closely watched, and appropriate preventive measures should be taken.

The negative effects of DVT during pregnancy must be reduced through early detection and prompt treatment.

References

1. Kesieme E, Kesieme C, Jebbin N, Irekpita E, Dongo A. Deep vein thrombosis: a clinical review. Journal of blood medicine. 2011; 29:59-69.
2. Catalano PM. Management of obesity in pregnancy. Obstetrics & gynecology. 2007 ;109(2 Part 1):419-33.
3. Ortega MA, Fraile-Martínez O, García-Montero C, Álvarez-Mon MA, Chaowen C, Ruiz-Grande F, Pekarek L, Monserrat J, Asúnsolo A, García-Honduvilla N, Álvarez-Mon M. Understanding chronic venous disease: a critical overview of its pathophysiology and medical management. Journal of clinical medicine. 2021;10(15):3239.
4. Palareti G, Schellong S. Isolated distal deep vein thrombosis: what we know and what we are doing. Journal of Thrombosis and Haemostasis. 2012;10(1):11-9.
5. McColl MD, Ramsay JE, Tait RC, Walker ID, McCall F, Conkie JA, Carty MJ, Greer IA. Risk factors for pregnancy associated venous thromboembolism. Thrombosis and haemostasis. 1997;78(10):1183-8.
6. Simpson EL, Lawrenson RA, Nightingale AL, Farmer RD. Venous thromboembolism in pregnancy and the puerperium: incidence and additional risk factors from a London perinatal database. BJOG: An International Journal of Obstetrics &Gynaecology. 2001 ;108(1):56-60.
7. Venkatanarayanan N, Walker KF. Evidence around early induction of labor in women of advanced maternal age and those using assisted reproductive technology. Best Practice & Research Clinical Obstetrics &Gynaecology. 2021;77:42-52.
8. Morgan ES, Wilson E, Watkins T, Gao F, Hunt BJ. Maternal obesity and venous thromboembolism. International journal of obstetric anesthesia. 2012 Jul 1;21(3):253-63.
9. Devis P, Knuttinen MG. Deep venous thrombosis in pregnancy: incidence, pathogenesis and endovascular management. Cardiovascular diagnosis and therapy. 2017;7(Suppl 3):S309.
10. James AH, Jamison MG, Brancazio LR, Myers ER. Venous thromboembolism during pregnancy and the postpartum period: incidence, risk factors, and mortality. American journal of obstetrics and gynecology. 2006 May 1;194(5):1311-5.
11. Struble E, Harrouk W, DeFelice A, Tesfamariam B. Nonclinical aspects of venous thrombosis in pregnancy. Birth Defects Research Part C: Embryo Today: Reviews. 2015 ;105(3):190-200.

12. Jacobsen AF, Skjeldestad FE, Sandset PM. Incidence and risk patterns of venous thromboembolism in pregnancy and puerperium—a register-based case-control study. American journal of obstetrics and gynecology. 2008;198(2):233-e1.
13. Zentner D, Celermajer DS, Gentles T, d'Udekem Y, Ayer J, Blue GM, Bridgman C, Burchill L, Cheung M, Cordina R, Culnane E. Management of people with a Fontan circulation: a Cardiac Society of Australia and New Zealand position statement. Heart, Lung and Circulation. 2020;29(1):5-39.
14. Sauer MV. Reproduction at an advanced maternal age and maternal health. Fertility and sterility. 2015 May 1;103(5):1136-43.
15. Arya R. How I manage venous thromboembolism in pregnancy. British journal of haematology. 2011;153(6):698-708.
16. O'Connor DJ, Scher LA, Gargiulo III NJ, Jang J, Suggs WD, Lipsitz EC. Incidence and characteristics of venous thromboembolic disease during pregnancy and the postnatal period: a contemporary series. Annals of vascular surgery. 2011 Jan 1;25(1):9-14.
17. Buchholz T, Thaler CJ. Inherited thrombophilia: impact on human reproduction. American Journal of Reproductive Immunology. 2003;50(1):20-32.
18. Taylor J, Hicks CW, Heller JA. The hemodynamic effects of pregnancy on the lower extremity venous system. Journal of Vascular Surgery: Venous and Lymphatic Disorders. 2018;6(2):246-55.
19. Dargaud Y, Rugeri L, Fleury C, Battie C, Gaucherand P, Huissoud C, Rudigoz RC, Desmurs-Clavel H, Ninet J, Trzeciak MC. Personalized thromboprophylaxis using a risk score for the management of pregnancies with high risk of thrombosis: a prospective clinical study. Journal of Thrombosis and Haemostasis. 2017;15(5):897-906.
20. Danwang C, Temgoua MN, Agbor VN, Tankeu AT, Noubiap JJ. Epidemiology of venous thromboembolism in Africa: a systematic review. Journal of Thrombosis and Haemostasis. 2017;15(9):1770-81.
21. Pomp ER, Lenselink AM, Rosendaal FR, Doggen CJ. Pregnancy, the postpartum period and prothrombotic defects: risk of venous thrombosis in the MEGA study. Journal of Thrombosis and Haemostasis. 2008;6(4):632-7.
22. Clarkin PF. Adiposity and height of adult Hmong refugees: relationship with war-related early malnutrition and later migration. American Journal of Human Biology. 2008 ;20(2):174-84.
23. Simpson EL, Lawrenson RA, Nightingale AL, Farmer RD. Venous thromboembolism in pregnancy and the puerperium: incidence and additional risk factors from a London perinatal database. BJOG: An International Journal of Obstetrics &Gynaecology. 2001 ;108(1):56-60.
24. Seale H, Dyer CE, Abdi I, Rahman KM, Sun Y, Qureshi MO, Dowell-Day A, Sward J, Islam MS. Improving the impact of non-pharmaceutical interventions during COVID-19: examining the factors that influence engagement and the impact on individuals. BMC Infectious Diseases. 2020;20(1):1-3.
25. AlShami HA, Kadasne AR, Khalfan M, Iqbal SZ, Mirghani HM. Pregnancy outcome in late maternal age in a high-income developing country. Archives of Gynecology and Obstetrics. 2011; 284:1113-6.
26. Leddy MA, Power ML, Schulkin J. The impact of maternal obesity on maternal and fetal health. Reviews in obstetrics and gynecology. 2008;1(4):170.
27. White RH, Chan WS, Zhou H, Ginsberg JS. Recurrent venous thromboembolism after pregnancy-associated versus unprovoked thromboembolism. Thrombosis and haemostasis. 2008;100(08):246-52.

28. Nath KA. PREGNANCY, THE PUERPERIUM. AND PULMONARY EMBOLISM. InMayo Clinic Proceedings 2021; 96 (8): 2017-2019.
29. Esmon CT. Basic mechanisms and pathogenesis of venous thrombosis. Blood reviews. 2009 ;23(5):225-9.
30. Ahmed S, Alsheeha M, Alsammani M. Risks and indications for cesarean sections in primiparous women: A case-control study. Annals of tropical medicine and public health. 2013;6(5):541.
31. Kesieme E, Kesieme C, Jebbin N, Irekpita E, Dongo A. Deep vein thrombosis: a clinical review. Journal of blood medicine. 201129:59-69.
32. Neuberger F, Wennike N. Problem based review: pulmonary embolism in pregnancy. Acute Med. 2013;12(4):239-45.
33. Mclintock C, Brighton T, Chunilal S, Dekker G, Mcdonnell N, Mcrae S, Muller P, Tran H, Walters BN, Young L. Recommendations for the diagnosis and treatment of deep venous thrombosis and pulmonary embolism in pregnancy and the postpartum period. Australian and New Zealand Journal of Obstetrics and Gynaecology. 2012;52(1):14-22.
34. Kolbach DN, Sandbrink MW, Hamulyak K, Prins MH, Neumann MH. Non-pharmaceutical measures for prevention of post-thrombotic syndrome. Cochrane Database of Systematic Reviews. 2003(3).
35. Ginsberg JS, Hirsh J, Julian J, Vander LaandeVries M, Magier D, MacKinnon B, Gent M. Prevention and treatment of postphlebitic syndrome: results of a 3-part study. Archives of Internal Medicine. 2001;161(17):2105-9.
36. Prandoni P, Kahn SR. Post-thrombotic syndrome: prevalence, prognostication and need for progress. British journal of haematology. 2009;145(3):286-95.
37. Abdul Sultan A, Tata LJ, Grainge MJ, West J. The incidence of first venous thromboembolism in and around pregnancy using linked primary and secondary care data: a population based cohort study from England and comparative meta-analysis. PloS one. 2013;8(7):e70310.
38. Ivasyk I, Chatterjee A, Jordan C, Geiselmann MT, Chang PS, Kamel H, Khormaee S. Evaluation of the safety of tranexamic acid use in pediatric patients undergoing spinal fusion surgery: a retrospective comparative cohort study. BMC Musculoskeletal Disorders. 2022;23(1):1-6.
39. Ramlakhan KP, Johnson MR, Roos-Hesselink JW. Pregnancy and cardiovascular disease. Nature Reviews Cardiology. 2020;17(11):718-31.
40. Hillegass E, Puthoff M, Frese EM, Thigpen M, Sobush DC, Auten B, Guideline Development Group. Role of physical therapists in the management of individuals at risk for or diagnosed with venous thromboembolism: evidence-based clinical practice guideline. Physical therapy. 2016;96(2):143-66.
41. Obeagu EI, Nwosu DC, Obeagu III GU. Antithrombin III: A Review. Int J Curr Res Biol Med. 2022;7(2):20-7.
42. Okoroiwu IL, Obeagu EI, Vivian Egwim V. Assessment of White Blood Cell Count and Platelet Count in Women on Hormonal Contraceptives in Owerri, Imo State, Nigeria. J Res Med Dent Sci. 2021;9(12):498-501.
43. Obeagu EI, Anierobi CC, Babar Q. Updates on Paroxysmal Nocturnal Haemoglobinuria. Int. J. Curr. Res. Med. Sci. 2021;7(7):14-22.
44. Obeagu EI. Vaso-occlusion and adhesion molecules in sickle cells disease. Int J Curr Res Med Sci. 2018;4(11):33-5.

45. Obeagu EI, Obeagu GU, Kama SC. Fibrin degradation product and Haemorrhage. Int. J. Curr. Res. Chem. Pharm. Sci. 2022;9(1):21-7.
46. Obeagu EI, Ogunnaya FU. PREGNANCY-INDUCED HAEMATOLOGICAL CHANGES: A KEY TO MARTERNAL AND CHILD HEALTH. European Journal of Biomedical. 2023;10(8):42-3.
47. Obeagu EI, Babar Q. Acute Myeloid Leukaemia (AML): The Good, the Bad, and the Ugly. Int. J. Curr. Res. Med. Sci. 2021;7(7):29-41.
48. Obeagu EI, Nwosu DC. Exercise and Plasminogen. Int. J. Curr. Res. Biol. Med.
49. 7(2): 40-47.DOI: http://dx.doi.org/10.22192/ijcrbm.2022.07.02.004
50. Okoroiwu IL, Obeagu EI, Obeagu GU, Ezema GO, Iwegbulam CP. Some haematological variables in systemic lupus erythematosus patients Imo state Nigeria. Int. J. Curr. Res. Med. Sci. 2016;2(3):8-15.
51. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of coagulation parameters in malaria infected pregnant women in Imo state, Nigeria. International Journal of Current Research in Medical Sciences. 2018;4(9):41-9.
52. Obeagu EI, Obeagu GU. Sickle Cell Anaemia in Pregnancy: A Review. International Research in Medical and Health Sciences. 2023;6(2):10-3.
53. Obeagu EI, Ikpenwa JN, Chukwueze CM, Obeagu GU. Evaluation of protein C, protein S and fibrinogen of pregnant women in Owerri Metropolis. Madonna University Journal of Medicine and Health Sciences ISSN: 2814-3035. 2022 Apr 18;2(1):292-8.
54. Obeagu EI. An update on utilization of antenatal care among pregnant Women in Nigeria. Int. J. Curr. Res. Chem. Pharm. Sci. 2022;9(9):21-6.
55. Okoroiwu IL, Obeagu EI, Obeagu GU. Determination of clot retraction in preganant women attending antenatal clinic in federal medical centre Owerri, Nigeria. Madonna University Journal of Medicine and Health Sciences ISSN: 2814-3035. 2022;2(2):91-7.
56. Obeagu EI, Hassan AO, Adepoju OJ, Obeagu GU, Okafor CJ. Evaluation of Changes in Haematological Parameters of Pregnant Women Based on Gestational Age at Olorunsogo Road Area of Ido, Ondo State. Nigeria. Journal of Research in Medical and Dental Science. 2021;9(12):462-.
57. Obeagu EI, Obeagu GU, Chukwueze CM, Ikpenwa JN, Ramos GF. EVALUATION OF PROTEIN C, PROTEIN S AND FIBRINOGEN OF PREGNANT WOMEN WITH MALARIA IN OWERRI METROPOLIS. Madonna University journal of Medicine and Health Sciences ISSN: 2814-3035. 2022 ;2(2):1-9.
58. Anyiam AF, Obeagu EI, Obi E, Omosigho PO, Irondi EA, Arinze-Anyiam OC, Asiyah MK. ABO blood groups and gestational diabetes among pregnant women attending University of Ilorin Teaching Hospital, Kwara State, Nigeria. International Journal of Research and Reports in Hematology. 2022;5(2):113-21.
59. Okorie HM, Obeagu EI, Obarezi HC, Anyiam AF. Assessment of some inflammatory cytokines in malaria infected pregnant women in Imo State Nigeria. International Journal of Medical Science and Dental Research. 2019;2(1):25-36.
60. Obeagu EI, Abdirahman BF, Bunu UO, Obeagu GU. Obsterics characteristics that effect the newborn outcomes. Int. J. Adv. Res. Biol. Sci. 2023;10(3):134-43.
61. Okamgba OC, Nwosu DC, Nwobodo EI, Agu GC, Ozims SJ, Obeagu EI, Ibanga IE, Obioma-Elemba IE, Ihekaire DE, Obasi CC, Amah HC. Iron Status of Pregnant and Post-Partum Women with Malaria Parasitaemia in Aba Abia State, Nigeria. Annals of Clinical and Laboratory Research. 2017;5(4):206.
62. Obeagu EI, Opoku D, Obeagu GU. Burden of nutritional anaemia in Africa: A Review. Int. J. Adv. Res. Biol. Sci. 2023;10(2):160-3.

63. Obeagu EI, Obeagu GU, Musiimenta E. Post partum haemorrhage among pregnant women: Update on risks factors. Int. J. Curr. Res. Med. Sci. 2023;9(2):14-7.

Access this Article in Online	
	Website: www.ijcrcps.com
Quick Response Code	Subject: Hematology
DOI: 10.22192/ijcrcps.2023.10.08.002	

How to cite this article:
Emmanuel Ifeanyi Obeagu, Getrude Uzoma Obeagu and Frances Ugonne Ogunnaya. (2023). Deep vein thrombosis in pregnancy: A review of prevalence and risk factors. Int. J. Curr. Res. Chem. Pharm. Sci. 10(8): 14-21.
DOI: http://dx.doi.org/10.22192/ijcrcps.2023.10.08.002

