



Use of Enoxaparin in Obstetrics and Gynecology Department

Nehad J. Ahmed^{1*}

¹*Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam Bin Abdulaziz University, Al-kharj, Saudi Arabia.*

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/JPRI/2020/v32i830464

Editor(s):

(1) Dr. Jongwha Chang, University of Texas, USA.

Reviewers:

(1) Meral Ekim, Bozok University, Turkey.

(2) Eduardo Carvalho de Arruda Veiga, University of São Paulo, Brazil.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/55807>

Original Research Article

Received 28 January 2020

Accepted 01 April 2020

Published 25 May 2020

ABSTRACT

Aims: This study aims to demonstrate the use of enoxaparin in obstetrics and gynecology department in Alkharj.

Methodology: This is a retrospective study was conducted in a public hospital in Alkharj city. The outpatient prescriptions were reviewed to evaluate the prescription patterns of enoxaparin. The data were collected and analyzed using Excel software, the descriptive data were represented by frequencies and percentages.

Results: About 86.32% of the prescriptions contain enoxaparin syringe were prescribed for female patients. The majority of enoxaparin prescriptions were from obstetrics & gynecology department (79.48%). Moreover, the majority of enoxaparin prescriptions were prescribed by consultants (62.39%).

Conclusion: The result of this study show that enoxaparin was prescribed commonly in the obstetrics and gynecology department for female patients because of its efficacy and safety profile. Enoxaparin is safer than other anticoagulants but still could cause many adverse effects so it is important to increase the health care professional awareness about its use.

Keywords: Use; enoxaparin; obstetrics; gynecology; pregnancy.

*Corresponding author: E-mail: n.ahmed@psau.edu.sa, pharmdnehadjaser@yahoo.com;

1. INTRODUCTION

Venous thrombosis is a disorder in which a blood clot forms in a vein. Frequently, venous thrombosis occurs in the “deep veins” in the legs, thighs or pelvis and this is called a deep vein thrombosis [1].

Deep vein thrombosis treatment is aimed to prevent the clot from getting bigger and to prevent it from breaking loose and causing a pulmonary embolism. Moreover, it is important to reduce the chances of deep vein thrombosis happening again. There are many options for treating deep vein thrombosis particularly the use of anticoagulants, also called blood thinners. Anticoagulants include Heparin which is typically given intravenously. Other similar blood thinners, such as enoxaparin, dalteparin or fondaparinux are injected under the skin. Moreover, some anticoagulants are given orally such as warfarin and dabigatran [2].

One of the commonly used anticoagulants is enoxaparin. It is used to prevent blood clots in the leg in patients who are on bedrest or who are having knee replacement, hip replacement or stomach surgery. It is used also to prevent complications from angina and heart attacks in combination with aspirin [3].

There are many risk factors to venous thromboembolism such as pregnancy [4]. Pregnancy is a known hypercoagulable state. In general, there is a five-fold increased risk of venous thromboembolism during pregnancy that persists for 12 weeks postpartum [5].

Vitamin K antagonists are associated with fetal malformations if they are used in the first trimester and increase the risk of bleeding in the fetus throughout gestation [6]. Heparin was widely used for prevention and management of gestational thromboembolism in pregnancy. However, it causes some safety concerns specially by causing heparin-induced thrombocytopenia. Additionally, low but real risk of increased severe osteoporosis that can manifest as vertebral fractures [7–9].

There is a broad agreement that low-molecular-weight heparin is the anticoagulant of choice in pregnancy. It is now the most commonly used anticoagulant for the treatment and the prophylaxis of venous thromboembolism in pregnancy and the puerperium [10,11].

Low-molecular-weight heparin offers advantages over heparin that include its longer half-life, its once-daily dosing, and weight-based dosing. Notably, there are no documented fetal or neonatal risks to maternal use of low-molecular-weight heparin for pregnant women. In a previous study, Greer I.A and Nelson-Piercy C included 174 pregnant women on a therapeutic dose of low-molecular-weight heparin in their study and reported that only 2 experienced deep venous thrombosis and none experienced arterial embolism, supporting the efficacy of low-molecular-weight heparin for prophylaxis of venous thromboembolism [12].

Warfarin is listed as pregnancy category D, low-molecular-weight heparin is listed as pregnancy category B and heparin falls into category C [5,13]. Therefore, enoxaparin is more commonly used in obstetrics/gynecology department, especially for pregnant women than other anticoagulants. As a result, this study aims to demonstrate the use of enoxaparin in obstetrics and gynecology department in Alkharj.

2. METHODOLOGY

This is a retrospective study was conducted in a public hospital in Alkharj city. The outpatient prescriptions were reviewed to evaluate the prescription patterns of enoxaparin. The inclusion criteria include all outpatient prescriptions that contains enoxaparin in 2018.

The exclusion criteria include the prescriptions in inpatient setting, the prescriptions before or after 2018 and the prescriptions that don't contain enoxaparin.

The data were collected and analyzed using Excel software, the descriptive data were represented by frequencies and percentages.

This study was approved by the Institutional Review Board log number 2019-0153E.

3. RESULTS

In 2018, 117patients received a prescriptions contain enoxaparin syringe. About 86.32% of the patients were female. Table 1 shows the personal data of the patients.

The age of the majority of the patients was between 30-49 (72.64%). The age of the patients was represented in Table 2.

Table 1. Personal data

Variable	Category	Number	Percentage
Gender	Male	16	13.67%
	Female	101	86.32%
Nationality	Saudi	72	61.53%
	Non – Saudi	45	38.46%

Table 2. The age of the patients

Age	Number of prescribed enoxaparin	Percentage of prescribed enoxaparin
20-29	28	23.93%
30-39	52	44.44%
40-49	33	28.20%
50-59	3	2.56%
Mora than 59	1	0.85%

Table 3. The departments that prescribed enoxaparin

Department	Number of prescribed enoxaparin	Percentage of prescribed enoxaparin
Cardiology	1	0.85%
Emergency	2	1.70%
Nephrology	5	4.27%
Obstetrics & Gynecology	93	79.48%
Orthopedic	16	13.67%

Table 4. The level of the prescribers

Variable	Number of prescribed enoxaparin	Percentage of prescribed enoxaparin
Specialist	18	15.38%
Resident	26	22.22%
Consultant	73	62.39%

The majority of enoxaparin prescriptions were from obstetrics & gynecology department (79.48%). Table 3 shows the departments that prescribed enoxaparin.

The majority of enoxaparin prescriptions were prescribed by consultants (62.39%). The level of the prescribers was shown in Table 4.

4. DISCUSSION

This result is rational because the risk factors of venous thromboembolism include age ≥ 40 years as in this study 31.61% of the patients were more than 40. Moreover, risk factors for venous thromboembolism include pregnancy and using oral contraceptive therapy that are more common in females less than 40 years old, so it is rational that there were a high percentage of patients in the ages between 20-39 receiving enoxaparin. [4]

Enoxaparin was prescribed more in the department of obstetrics & gynecology

department (79.48%) followed by Orthopedic department. This result is also rational because the pregnant females, women using contraceptive specially with low mobility are at high risk for venous thromboembolism [4].

Ellison et al. [14] reported that regarding the use of 40 mg once daily of enoxaparin for prevention and treatment of thromboembolism in pregnancy, it is associated with a low incidence of complications and appears effective in preventing venous thromboembolism [14]. Moreover, Brenner [15] reported that low-molecular-weight heparin is the anticoagulant of choice in pregnancy [15]. Additionally, Martino et al. [16] reported that enoxaparin is safe to use if given preoperatively for prophylaxis of venous thromboembolism in major gynecologic surgeries [16].

Moreover, a high percentage of the patients was in orthopedic department, similar results were found in previous studies which reported that lower extremity orthopedic operations carry a

particularly high risk for venous thromboembolism. They also stated that without prophylaxis, approximately half of the patients undergoing elective total knee or hip replacement develop venous thromboembolism. However, only about 5% of these patients manifest symptoms of venous thromboembolism [17-20]. Moreover, Leme and Sguizzatto reported that among hospitalized patients and those submitted to surgery, patients who have undergone surgery for cancer, or orthopedic surgery, are at higher risk of venous thromboembolism [21].

In general, low molecular weight heparins are used for the treatment or prophylaxis of deep vein thrombosis. It is not easy to choose the preferred drug among the anticoagulants because the decision to use low molecular weight heparin instead of standard heparin or warfarin will depend upon the clinical scenario and individual patient factors such as risk of bleeding or availability of venous access [22]. The result of our study also stated that the majority of enoxaparin prescriptions were prescribed by consultant (62.39%). Moreover, if the prescriptions are prescribed by residents, it is important to refer to consultant when needed. For example, the prescribing physicians should alert the referring consultant to any significant changes in patients' weight, renal function or platelet count [23]. Additionally, NHS Wirral clinical guideline reported that any decision to offer a low molecular weight heparin on discharge should be made by a consultant and will be made most frequently by the consultant acute physician or consultant on-call for the acute take. Moreover, the on-call consultant hematologist is also available to discuss complex cases [24]. In addition to that NHS reported that the choose of dose and duration of enoxaparin in the obstetrics and gynecology should be done by consultants specially in some situations such as if the patient has renal problems [25].

5. CONCLUSION

The results of this study show that enoxaparin was prescribed commonly in obstetrics and gynecology department for female patients because of its efficacy and safety profile and also it is the anticoagulant of choice in the case of pregnancy. Enoxaparin is safer than other anticoagulants but still could cause many adverse effects so it is important to increase the health care professional awareness about its indications, dosage, duration, adverse effects, drug interactions and its use in specific situations.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

ACKNOWLEDGEMENT

"This Publication was supported by the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University"

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. North Bristol NHS Trust. Heparin Use During Pregnancy; 2020. [online] Available:<<https://www.nbt.nhs.uk/maternity-services/pregnancy/heparin-use-during-pregnancy>> [Accessed 17 March 2020].
2. MayoClinic.org. Deep Vein Thrombosis - Diagnosis and Treatment - Mayo Clinic; 2020. [online] Available:<<https://www.mayoclinic.org/diseases-conditions/deep-vein-thrombosis/diagnosis-treatment/drc-20352563>> [Accessed 17 March 2020]
3. Medlineplus.gov. Enoxaparin Injection: Medlineplus Drug Information; 2020. [online] Available:<<https://medlineplus.gov/druginfo/meds/a601210.html>> [Accessed 17 March 2020]
4. Frederick A. Anderson Jr, Frederick A. Spencer. Risk Factors for Venous Thromboembolism. *Circulation*. 2003;107: 1-9-1-16.
5. Alshawabkeh L, Economy KE, Valente AM. Anticoagulation During Pregnancy: Evolving Strategies With a Focus on Mechanical Valves. *J Am CollCardiol*. 2016;68:1804-1813.
6. Vitale N, De Feo M, De Santo LS, Pollice A, Tedesco N, Cotrufo M. Dose-dependent

- fetal complications of warfarin in pregnant women with mechanical heart valves. *J. Am. Coll. Cardiol.* 1999;33:1637–1641.
7. Hirsh J. Heparin. *N. Engl. J. Med.* 1991; 325:1585–1586.
 8. Nelson-Piercy C. Hazards of heparin: Allergy, heparin-induced thrombocytopenia and osteoporosis. *Baillieres Clin. Obstet. Gynaecol.* 1997;11:489–509.
 9. Hirsh J, Raschke R, Warkentin TE, Dalen JE, Deykin D, Poller L. Heparin: Mechanism of action, pharmacokinetics, dosing considerations, monitoring, efficacy, and safety. *Chest.* 1995;108(Suppl. 4): S258–S275.
 10. Ginsberg JS, Greer I, Hirsh J. Use of antithrombotic agents during pregnancy. *Chest.* 2001;119(Suppl.1):S122–S131.
 11. Greer IA. Exploring the role of lowmolecular-weight heparins in pregnancy. *Semin. Thromb. Hemost.* 2002; 28(Suppl.3):25–31.
 12. Ian A. Greer and Catherine Nelson-Piercy. Low-molecular-weight heparins for thromboprophylaxis and treatment of venous thromboembolism in pregnancy: A systematic review of safety and efficacy. *Blood.* 2005;106:401–407.
 13. Rxwiki. Heparin. 2020. | Rxwiki. [online] Available:<<https://www.rxwiki.com/heparin>> [Accessed 17 March 2020]
 14. Ellison J, Walker ID, Greer IA. Antenatal use of enoxaparin for prevention and treatment of thromboembolism in pregnancy. *BJOG.* 2000;107(9):1116-21.
 15. Brenner B. Enoxaparin Use in Pregnancy: State of the Art. *Women's Health.* 2007;9–14.
 16. Martino MA, George JG, Chen CC, Galic V, Kapoor R, Murray KC et al. Preoperative enoxaparin is safe to use in major gynecologic surgery for prophylaxis of venous thromboembolism: A retrospective cohort study. *Int J Gynecol Cancer.* 2012;22(4):681-5.
 17. Collins R, Scrimgeour A, Yusuf S, Peto R. Reduction in fatal pulmonary embolism and venous thrombosis by perioperative administration of subcutaneous heparin. Overview of results of randomized trials in general, orthopedic, and urologic surgery. *N Engl J Med.* 1988;318:1162–1173.
 18. Bergqvist D. Postoperative Thromboembolism. New York: Springer-Verlag. 1983;16–22.
 19. Paiement GD, Bell D, Wessinger SJ. New advances in the prevention, diagnosis, and cost effectiveness of venous thromboembolic disease in patients with total hip replacement, in: *The Hip, Proceedings of the Fourteenth Open Scientific Meeting of the Hip Society.* Saint Louis, C. V. Mosby. 1987;94–119.
 20. Stulberg BN, Insall JN, Williams GW, Ghelman B. Deep-vein thrombosis following total knee replacement. An analysis of six hundred and thirty-eight arthroplasties. *J Bone Joint Surg Am.* 1984;66:194–201.
 21. Leme LEG, Sguizzatto GT. Prophylaxis of venous thromboembolism in orthopaedic surgery. *Rev Bras Ortop.* 2012;47(6):685-693.
 22. Melbourne, T. Clinical Haematology: Clexane Guidelines For Clinicians Low Molecular Weight Heparin. 2020. [online] Rch.org.au. Available:<https://www.rch.org.au/haematology/anticoagulation_service/clexane-guidelines/> [Accessed 17 March 2020].
 23. Ipnsm.hscni.net; 2020. [online] Available:<http://www.ipnsm.hscni.net/download/shared_care_guidelines/Enoxaparin_SCGJune2012.pdf> [Accessed 17 March 2020]
 24. Mm.wirral.nhs.uk; 2020. [online] Available:<<https://mm.wirral.nhs.uk/document/uploads/guidelines/LMWHprescribingandadministrationv1a.pdf>> [Accessed 17 March 2020]
 25. Ncl-mon.nhs.uk. 2020. [online] Available:<https://www.ncl-mon.nhs.uk/wp-content/uploads/Guidelines/9_LMWH_guideline.pdf> [Accessed 17 March 2020]

© 2020 Ahmed; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/55807>