Role of misoprostol in obstetrics and gynecology: applications, efficacy, and safety.

Chiara Corrado*

Department of Family Medicine, university of Edinburgh, Edinburgh, United Kingdom.

Introduction

Misoprostol, a synthetic prostaglandin E1 analog, has revolutionized obstetrics and gynecology with its diverse applications. Originally developed for treating gastric ulcers, misoprostol has been repurposed for various obstetric and gynecological uses due to its uterotonic properties. This essay explores the multifaceted roles of misoprostol, including its applications in labor induction, management of miscarriage, cervical ripening, postpartum hemorrhage prevention, and therapeutic abortion. The discussion also addresses its efficacy, safety profile, and guidelines for use [1].

Misoprostol exerts its effects by binding to prostaglandin receptors on smooth muscle cells, particularly in the uterus and gastrointestinal tract. This binding results in increased intracellular calcium, leading to muscle contraction. In obstetrics, this mechanism is harnessed to induce uterine contractions, facilitate cervical ripening, and manage hemorrhage through uterine atony reduction. Understanding this pharmacological basis is crucial for optimizing its clinical applications [2].

Misoprostol is widely used for labor induction, particularly in cases of medical necessity such as post-term pregnancy, preeclampsia, or intrauterine growth restriction. It is administered vaginally, orally, or sublingually to initiate uterine contractions and cervical ripening. Studies have shown that misoprostol is effective in reducing the induction-to-delivery interval, often outperforming other agents like oxytocin and dinoprostone in efficacy and cost [3].

Misoprostol is employed in the management of missed or incomplete miscarriage, providing a non-surgical option for uterine evacuation. Administered vaginally or orally, it facilitates the expulsion of retained products of conception. This method is particularly beneficial in settings where surgical options are limited or patient preference leans towards non-invasive management. Clinical trials have demonstrated success rates ranging from 80% to 90% for complete evacuation [4].

Prior to procedures like hysteroscopy or dilation and curettage, misoprostol is used to soften and dilate the cervix, reducing the risk of cervical injury. Its application in this context has been associated with reduced procedural complications and improved ease of access for surgical instruments. Misoprostol's effectiveness in cervical ripening is comparable to mechanical methods and other pharmacological agents but offers a less invasive approach.

Postpartum hemorrhage (PPH) remains a leading cause of maternal mortality. Misoprostol, due to its uterotonic properties, is utilized in the prophylaxis and treatment of PPH, especially in low-resource settings where access to oxytocin is limited. It can be administered orally, sublingually, or rectally, offering flexibility in administration routes. Randomized controlled trials have confirmed its efficacy in reducing the incidence and severity of PPH [5].

Misoprostol, in combination with mifepristone or methotrexate, is used for medical abortion. This combination is highly effective in terminating early pregnancies, providing a non-invasive alternative to surgical abortion. The regimen involves an initial dose of mifepristone, followed by misoprostol to induce uterine contractions and expel the pregnancy. Studies indicate success rates exceeding 95% when used within the first 10 weeks of gestation [6].

In cases of cervical insufficiency, misoprostol is used to prepare the cervix for the placement of a cervical cerclage. Its application helps in achieving adequate cervical dilation and reducing the risk of cervical trauma during the procedure. Although less common than other uses, it provides a pharmacological approach to managing this condition [7].

While not the primary treatment for ectopic pregnancy, misoprostol has been used in conjunction with methotrexate in select cases. This combination can help manage early unruptured ectopic pregnancies, particularly in patients seeking to avoid surgery. However, its use is less established and requires careful patient selection and monitoring.

Misoprostol is used off-label for menstrual regulation in cases of delayed menstruation or anovulatory cycles. It induces uterine contractions and endometrial shedding, mimicking the natural menstrual process. This application, while not universally practiced, offers an option for managing menstrual irregularities in certain clinical scenarios [8].

Misoprostol's efficacy across various applications has been well-documented in clinical trials and practice. Its success in labor induction, miscarriage management, and PPH prevention underscores its versatility. However, the efficacy can vary based on the route of administration, dosage, and clinical context.

***Correspondence to:** Chiara Corrado, Department of Family Medicine, university of Edinburgh, Edinburgh, United Kingdom, E-mail: Corrado@yahoo.co.uk

***Received:** 03-July-2024, Manuscript No. AAGGS-24-142583; **Editor assigned:** 06-July-2024, PreQC No. AAGGS-24-142583(PQ); **Reviewed:** 20-July-2024, QC No. AAGGS-24-142583; **Revised:** 22-July-2024, Manuscript No. AAGGS-24-142583(R); **Published:** 26-July-2024, DOI: 10.35841/2591-7994-8.4.217*

***Citation:** Corrado C. Role of misoprostol in obstetrics and gynecology: applications, efficacy, and safety. Gynecol Reprod Endocrinol. 2024;8(4):217.*

While generally safe, misoprostol is associated with side effects such as gastrointestinal discomfort, fever, and chills. In obstetric use, uterine hyperstimulation and potential for uterine rupture in scarred uteri are concerns. Proper dosing and adherence to guidelines mitigate these risks. Long-term safety data are reassuring, with no evidence of teratogenicity when used appropriately [9].

Professional organizations like the American College of Obstetricians and Gynecologists (ACOG) and the World Health Organization (WHO) provide guidelines for misoprostol use. These guidelines emphasize appropriate dosing, administration routes, and patient selection criteria to optimize outcomes and minimize risks. Adherence to these recommendations ensures safe and effective use in clinical practice [10].

Conclusion

Misoprostol's role in obstetrics and gynecology is indispensable, offering effective, non-invasive solutions for a range of clinical scenarios. Its applications in labor induction, miscarriage management, cervical ripening, PPH prevention, and therapeutic abortion highlight its versatility. While generally safe, careful adherence to guidelines and monitoring is essential to mitigate risks. Continued research and guideline development will further refine its use, ensuring optimal maternal and fetal outcomes..

References

1. Wilson C. The nurse's role in misoprostol induction: a proposed protocol. J Obstet Gynecol Neonatal Nurs. 2000;29(6):574-83.
2. Mukta M, Sahay PB. Role of misoprostol 600 mcg oral in active management of third stage of labor: a comparative study with oxytocin 10 IU im. J Obstet Gynaecol India. 2013;63:325-7.
3. Wilson DE. Antisecretory and mucosal protective actions of misoprostol: potential role in the treatment of peptic ulcer disease. Am J Med. 1987;83(1):2-8..
4. Prata N, Bell S, Quaiyum MA. Modeling maternal mortality in Bangladesh: the role of misoprostol in postpartum hemorrhage prevention. BMC Pregnancy Childbirth. 2014;14:1-0.
5. Hofmeyr GJ, Gülmezoglu AM, Novikova N, et al. Misoprostol to prevent and treat postpartum haemorrhage: a systematic review and meta-analysis of maternal deaths and dose-related effects. Bull World Health Organ. 2009;87(9):666-77.
6. Wing DA, Rahall A, Jones MM, et al. Misoprostol: an effective agent for cervical ripening and labor induction. Am J Obstet Gynecol. 1995;172(6):1811-6.
7. Ashok PW, Templeton A, Wagaarachchi PT, et al. Midtrimester medical termination of pregnancy: a review of 1002 consecutive cases. Contraception. 2004;69(1):51-8.
8. Lemmers M, Verschoor MA, Kim BV, et al. Medical treatment for early fetal death (less than 24 weeks). Cochrane Database Syst Rev. 2019(6).
9. B Tunçalp Ö, Souza JP, Gülmezoglu M. New WHO recommendations on prevention and treatment of postpartum hemorrhage. Int J Gynaecol Obstet. 2013;123(3):254-6..
10. Panda S, Jha V, Singh S. Role of combination of mifepristone and misoprostol verses misoprostol alone in induction of labour in late intrauterin fetal death: a prospective study. J. fam. reprod. health. 2013;7(4):177.

Citation: *Corrado C. Role of misoprostol in obstetrics and gynecology: applications, efficacy, and safety. Gynecol Reprod Endocrinol. 2024;8(4):217.*