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Medication error in *in-vitro* fertilization assisted-twin pregnancy: A case report

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ABSTRACT

The increase in infertility rates, particularly in India, comes with societal challenges, often targeting women. Assisted reproductive technologies like *In-vitro* fertilization (IVF) offer hope, but due to their intricate procedure and multiple medications, high risks of errors persist. Here, we report a case of a woman in her mid-30s undergoing IVF-assisted treatment, where an inadvertent medication error occurred, leading to subsequent complications. The patient was followed for 9 months following the incident of administration error. Multiple complications other than IVF-assisted inherent complication, can be reduced through collaborative efforts and interdisciplinary teams.

INTRODUCTION

Infertility is rising and causing a significant health concern impacting many families and communities globally [1]. The prevalence of infertility is about 4%–16% in India [2]. This affects both men and women equally. In many societies of our nation, women will be blamed which results in discrimination, social stigma, psychological problems, and many more [3]. To overcome infertility and related issues, many couples opt for assisted reproductive technology (ART). *In-vitro* fertilization (IVF) is the most common form of ART [4]. It involves many medications and surgical interventions which make the process complex and stressful. Moreover, it can take up to several months to complete and complications may arise at any moment of treatment.

Moreover, while adhering to such complex treatment regimens, a significant proportion of patients forget to take their medication and feel unsure about the administration of medication, causing difficulty in following instructions provided with it and to adhere. Additionally, this treatment burden impacts the patients' physical and psychological states [5]. Especially in such situations, medication misadventures and errors are inevitable and pose significant threats to both mother and baby's health and well-being. Medication errors during IVF are common, raising concerns about negative effects on pregnancy outcomes. IVF treatment can result in adverse events such as ovarian hyperstimulation syndrome, multiple pregnancies, ectopic pregnancies, miscarriages, neonatal respiratory distress syndrome, and significant financial and psychological burdens [5,6]. These errors increase the risk of such complications. Additionally, medication-related problems in pregnant women can lead to longer hospital stays, more frequent hospital admissions, lower quality of life, higher healthcare costs, and increased risk of morbidity and mortality. Women over 26 years old, whether nulliparous or multiparous, are more likely to experience these issues [7]. Despite their rarity, such incidences must be cautiously evaluated to comprehend their impact on health outcomes and devise preventative measures while receiving care. This case

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emphasizes the effects of medication error in IVF-treated twin pregnancies' clinical and mental health conditions.

CASE PRESENTATION

A 35-year-old pregnant woman visited a community-based ambulatory clinic with the complaint of blood in vomiting, characterized as dark reddish brown in color and clotty in appearance. After accidental oral ingestion of a vaginal suppository of Clindamycin 200 mg + Clotrimazole 100 mg orally in an empty stomach. She experienced severe abdominal cramps and pain, following an administration error. A physical examination was performed and vitals were recorded. The patient's past medical record includes a history of lithotripsy surgery a year back. There was no history of peptic ulcer or any other gastrointestinal disorders. The patient underwent multiple cycles of ovulation induction-timed intercourse (OI-TI) treatment. The desired outcome was not attained with OI-TI, resulting in the choice of IVF-assisted pregnancy.

Initially, hormonal preparations were recommended and prescribed during the IVF-egg retrieval process. Laboratory investigation reflected normal HbA1c (4.5%) and serum beta HCG- >1,322 mIU/ml. The embryo was transferred, resulting in a twin pregnancy. After which, antithrombotic agents—aspirin 150 mg and enoxaparin 40 mg were added to prevent blood clots and increase endometrial blood flow to support embryo implantation and development. Hydroxyprogesterone 250 mg (weekly once), progesterone 100 mg*14 days, and dydrogesterone 100 mg daily were introduced in the treatment plan to thicken the endometrial lining and prevent premature labour. Iron and calcium supplements were continued as part of parturient care. Clotrimazole and clindamycin (200 mg+100 mg) combination containing vaginal suppository was prescribed for 3 days to treat UTI symptoms.

Unfortunately, the Patient had committed an administration error resulting in the medication misadventure, which was treated with ondansetron and pantoprazole. Furthermore, she was advised to withhold antithrombotic agents until the gynecologist's opinion. The case was also referred to the clinical pharmacist to intervene regarding the risk associated with medication error. The clinical pharmacist performed a comprehensive medication review, medication use safety assessment, and continued monitoring until 3 months postpartum to evaluate and understand the long-term impact on both maternal and infant wellbeing. Clinical pharmacist investigation reports suggested that the concurrent use of antithrombotic agents increases the risk of bleeding tendency, as a result of a significant drug interaction. The misadventure-causing medication was of class B pregnancy risk and had an incidence of causing potential adverse events such as pelvic pain (1%), loss of appetite (FND), vasculitis (FND), pruritis (<1%), nausea and vomiting (1%–10%). Furthermore, hematological, glucose challenge tests and doppler study (GA: 34 week) were performed. Investigation findings revealed that twin 1 (T1) had severe and moderate hydronephrosis in the fetal left kidney and right kidney, respectively. Oligohydramnios caused growth restriction (centile: 0.1, HC: 275 mm, weight: 1.49 kg) in twin 2 (T2). Other investigation values (Activated partial thromboplastin time, platelet and glucose) were within the normal range. The patient (GA: 35 weeks) underwent an LSCS procedure and gave birth to twin babies weighing 2.3 kg (T1: male) and 1.6 kg (T2: female). The mother and twin 1(T1) vitals were stable in postpartum. Meanwhile, the growth-restricted DCDA twin (T2) was shifted to the neonatal intensive care unit to stabilize the fluctuating vitals and for further observation.

Laboratory investigations of twin 2 were performed, during which hematological reports showed high levels of total bilirubin (3.2 g /dl). The neurosonogram and USG abdomen report were found to be normal. The cardiology report suggested dilated right-sided chambers and pulmonary hypertension with an ejection fraction of 69%. On further evaluation, a small atrial septal defect (ASD) of 3.2 mm was detected predominantly from the left to right shunt. The cardiologist and pediatrician's opinion was obtained for ASD. Surgery was not recommended and pulmonary hypertension was treated. T2 displayed a good response to the therapy and hence discharged after all the investigation findings were found normal. The head circumference and weight of twin 1 (T1) and twin 2 (T2) were found to be 37 cm, 35 cm, and 3.75 kg, 3 kg, respectively, in the third month of life. These findings suggest that twin babies were underweight.

DISCUSSION

Medication errors and misadventures are inevitable and can occur at any part of parturient care. The safety aspects during the parturient care can be hampered by such incidences. A study reported that medication errors (27%) are common during IVF- treatment. Moreover, these errors can be devastating as they harm both lives [8]. Furthermore, another study finding revealed that the highest number of significant errors included wrong explanations to the patient about the right medication consumption [9]. Hence, vigilance is essential at each step of parturient care.

Medication errors can be minimized by critically evaluating treatment decisions and adopting appropriate interventions during patient care. For instance, altered vaginal microflora, manifested as vaginosis, is a serious complication of ART, leading to preterm delivery, miscarriages, and maternal infectious morbidity. Most cases of vaginosis involve mixed infections with overlapping symptoms, complicating the differentiation between bacterial and fungal infections. The combination regimen of clindamycin and clotrimazole is considered the safe and standard treatment for addressing these infections [10]. However, the use of antithrombotic agents' in IVF-treatment is double-edged, requiring more clinical studies to provide strong evidence of their benefits for patients [11]. Furthermore, clinical evidence suggests that the risk of congenital and coagulation defects is high in patients with recurrent implantation failure and the pregnancy achieved by IVF procedure [12,13]. A case report reveals that one of the twins of the IVF-treated patient developed hydronephrosis [14]. Therefore, more collaborative clinical evaluation is required to fully comprehend these findings.

IVF- treatment requires accurate medication administration autonomously by the patient. For which, medication administration skills become critical to patients'

satisfaction and self-assurance when undergoing such complex treatment [15]. Patient education and counseling, along with the provision of relevant written information or pictograms, are critical strategies for enabling patients to effectively use their medications and reducing administration-related errors [16]. Furthermore, a team comprised of clinical pharmacists and interdisciplinary healthcare members can develop online video education programs for patients to prevent administration errors. Clinical pharmacy services in maternity and gynecological care have the potential to considerably minimize the frequency and consequences of such errors [8]. The patient undergoing IVF- treatment experiences a range of emotions, including anxiety, depression, fear of failure, and disappointment. Patient's confidence and self-esteem will be affected [17]. The healthcare expenditure associated with IVF treatment is relevantly high, which further affects the patient's mental and financial status. Therefore, maintaining good mental health and positive emotions during the IVF journey is vital. Emotional support from healthcare professionals and supportive family and friends are crucial to resolving these issues [18].

CONCLUSION

There is no definitive evidence suggesting that the adverse event resulted from a medication error. However, based on the temporal relationship, the adverse event can be attributed to the concurrent use of antithrombotic agents along with the incorrect use of clotrimazole and clindamycin suppositories, which was an administrative error. The interdisciplinary team approaches, as well as comprehensive treatment reviews by clinical pharmacists, may substantially minimize medication errors and associated risks.

AUTHOR CONTRIBUTIONS

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work. All the authors are eligible to be an author as per the International Committee of Medical Journal Editors (ICMJE) requirements/guidelines.

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DECLARATION OF PATIENT CONSENT

The authors certified that they have obtained all appropriate consents. The patient understood that their names and initials would not be published. The due efforts will be made to conceal their identity.

LIST OFABBREVIATIONS

DCDA, Dichorionic diamniotic; FND, Frequency not defined; GA, Gestational age; HC, Head circumference; IVF, *In vitro* fertilization; LSCS, Lower segment caesarean section; OI-TI, Ovulation induction- timed intercourse; UTI, Urinary tract infection.

REFERENCES

1. Infertility [Internet]. Who.int. [cited 2023 Jul 28]. Available from: https://www.who.int/news-room/fact-sheets/detail/infertility
2. Purkayastha N, Sharma H. Prevalence and potential determinants of primary infertility in India: evidence from Indian demographic health survey. Clin Epidemiol Glob Health [Internet]. 2021;9:162–70.
3. Roberts L, Renati S, Solomon S, Montgomery S. Women and infertility in a pronatalist culture: mental health in the slums of Mumbai. Int J Womens Health. 2020 Nov 6;12:993–1003.
4. Choe J, Shanks AL. *In vitro* fertilization. Treasure Island, FL: StatPearls Publishing; 2023.
5. Adeleye A, Cruz K, Cedars MI, Pasch L, Huddleston H. Learning from online video education (LOVE) improves confidence in fertility treatments: a randomized controlled trial. NPJ Digit Med. 2022 Aug 29;5(1):128. doi: https://doi.org/10.1038/s41746-022-00673-y
6. IVF [Internet]. nhs.uk. [cited 2024 Jul 2]. Available from: https://www.nhs.uk/conditions/ivf/risks/
7. Coussa A, Hasan HA, Barber TM. Impact of contraception and IVF hormones on metabolic, endocrine, and inflammatory status. J Assist Reprod Genet. 2020 Jun;37(6):1267–72. doi: https://doi.org/10.1007/s10815-020-01756-z
8. Ahmed SM, Sundby J, Aragaw YA, Nordeng H. Medication-related problems among hospitalized pregnant women in a tertiary teaching hospital in Ethiopia: a prospective observational study. BMC Pregnancy Childbirth [Internet]. 2020;20(1):737. Available from: http://dx.doi.org/10.1186/s12884-020-03433-6
9. Kaur M, Yalla B, Trikha A. Medication errors in a parturient: a huge cost to two lives. J Obstet Anaesth Crit Care. 2022;12(2):94–8. doi: https://doi.org/10.4103/JOACC.JOACC_17_22
10. Dehghan A, Abumasoudi RS, Ehsanpour S. Identification and assessment of common errors in the admission process of patients in Isfahan Fertility and Infertility Center based on "failure modes and effects analysis". Iran J Nurs Midwifery Res. 2016 Nov-Dec;21(6):646–51. doi: https://doi.org/10.4103/1735-9066.197674
11. Sharma D (brig) R. Routine screening and treatment of asymptomatic abnormal vaginal flora before ART: focus on clindamycin and clotrimazole—Walter Bushnell Healthcare Foundation [Internet]. Walterbushnell.com. Walter Bushnell Healthcare Foundation; 2017 [cited 2024 Jul 2]. Available from: https://wbhf.walterbushnell.com/publications/fertility-blaze/item/61-routine-screening-and-

treatment-of-asymptomatic-abnormal-vaginal-flora-before-art-focus-on-clindamycin-and-clotrimazole
12. Di Micco P, Russo V, Mastroiacovo D, Bosevski M, Lodigiani C. *In vitro* fertilization procedures with embryo transfer and their association with thrombophilia, thrombosis and early antithrombotic treatments. J Blood Med [Internet]. 2020;11:185–90. Available from: https://www.dovepress.com/getfile.php?fileID=58803
13. Seshadri S, Sunkara SK, Khalaf Y, El-Toukhy T, Hamoda H. Effect of heparin on the outcome of IVF treatment: a systematic review and meta-analysis. Reprod Biomed Online [Internet]. 2012;25(6):572–84. Available from: https://utcd.org.tr/wp-content/uploads/2017/10/2013-Ocak-Orj-1.pdf
14. Ericson A, Källén B. Congenital malformations in infants born after IVF: a population-based study. Hum Reprod [Internet]. 2001;16(3):504–9. Available from: https://doi.org/10.1093/humrep/16.3.504
15. Masarwa I, Bahouth Z, Halachmi S. Giant congenital hydronephrosis obstructing the gastro intestinal system and the contralateral kidney in a new born. Urol Case Rep. 2016 Jun 1;8:1–3. doi: https://doi.org/10.1016/j.eucr.2016.04.017
16. Roberts LM, Baker A, Margolis CK, Reig A, Gill P, Genovese HG, et al. When every dose counts: common medication errors in infertility care. Fertil Steril [Internet]. 2023;120(4):e259. Available from: http://dx.doi.org/10.1016/j.fertnstert.2023.08.764
17. Emotions when going through an IVF journey [Internet]. COPE, Australia, 2023 [cited 2024 May 14]. Available from: https://www.cope.org.au/planning-a-family/happening/managing-emotions-through-ivf/
18. Tips to Handle the Emotional Journey During IVF [Internet]. Milann.co.in. [cited 2024 May 14]. Available from: https://www.milann.co.in/blogs/tips-to-handle-the-emotional-journey-during-ivf

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