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Oxytocin: An unexpected risk for allergic reactions in susceptible delivering women

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Abstract

Background and objective: Oxytocin, widely used in obstetric care for labor induction and augmentation, is generally considered safe, with minimal adverse effects. However, despite its rarity, some individuals can develop hypersensitivity reactions, even without prior allergic history. This case report details a 30-year-old primigravida woman with an uneventful medical background who encountered a severe allergic reaction following oxytocin administration during a planned Lower Segment Caesarean Section (LSCS).

Case description: The patient underwent LSCS due to post-dated pregnancy. After the delivery and oxytocin administration, she swiftly exhibited signs of a severe allergic reaction. Immediate cessation of oxytocin was followed by the administration of intravenous antihistamines and corticosteroids. Fortunately, her condition stabilized within a few hours, and no further interventions were necessary. Postpartum allergy testing confirmed the patient's sensitivity to oxytocin through a positive skin test.

Discussion: This case underscores the imperative need to acknowledge the potential for severe allergic reactions to oxytocin, even among individuals devoid of previous allergic tendencies. It emphasizes the crucial role of clinicians in vigilantly monitoring patients during oxytocin administration, particularly in the initial stages, and being fully equipped to promptly manage any arising adverse reactions.

Keywords: Oxytocin; Allergic reaction; Labor and delivery; Hypersensitivity.

Introduction

Synthetic oxytocin, marketed under various brand names including Pitocin and syntonic, is a pharmaceutical compound derived from the peptide oxytocin. In the form of a medication, it is administered to induce uterine contractions to initiate labour, accelerate the labour process, and staunch postpartum haemorrhage. In most cases, severe allergic reactions during delivery are regarded as an uncommon consequence of cytokinin [1]. The publication of documented reports pertaining to severe airway obstructions and anaphylactic/anaphylactoid reactions is exceedingly limited [1,2]. Nonetheless, certain experimental findings suggest that in some allergic women, the risk of developing severe systemic reactions following oxytocin infusion during delivery may be greater than anticipated. Within this particular framework, allergic sensitization to latex, which

is a prevalent condition among females and the second most frequently implicated substance that causes anaphylaxis during anaesthesia, could potentially serve as a significant predisposing risk factor. Ogata and Minami established homology in the protein sequences of Hev b 7.02 (patatin), which is an allergen to latex, and oxytocin [3].

Case report

30 year old women admitted in obstetric ward on 16/06/2023. She was G3P1L1A1. She had given birth to Male child previously 2 years back by Lower Segment Caesarean Section (LSCS). On examination her Non-Stress Test was non-reactive and an emergency LSCS had to be planned. She was prepared for the OT (catheterized and pre-medicated) and sent to Anaesthesia team. There we assessed her; her emergency Pre Anaesthesia Checkup (PAC) was fine. All her investigations were within normal limit. Nil per oral status was fine. Patient was cannulated with 18 Gauge cannula and was pre-loaded with Ringer Lactate and was shifted to OT. Inside Operation Theatre her vitals were connected and Spinal Anaesthesia was given after all aseptic precaution. 2.2 ml heavy Bupivacaine was administered in L2-L3 space. Her paraspinal Blood pressure was 128/78 mmHg. After giving spinal her BP fell to 114/68 mmHg within 5 min. surgery was started and she was being administered Ringer Lactate at approximately 70 ml/min. after delivery of baby we immediately gave her Oxytocin 15 International Units in her drip and drip was slowed down to 35-45 ml/min. After couple of minutes of starting oxytocin patient started complaining of light-headedness and her Blood Pressure dropped to 60/40 mmHg and she started complaining of severe pruritus and Dyspnoea. Immediately oxytocin drip was stopped and she was shifted to RL at 75-80 ml/min and injection epinephrine (adrenaline) 0.5 ml (0.05 mg) of 1: 10000 strength given intravenously, Followed by injection pheniramine maleate 22.75 mg and injection dexamethasone (8 mg) intravenous. Patient shifted to 100% Oxygen at 5 L/min. After few minutes her pruritus decreased and flushing of face also decreased her BP was increased to 100/62mmHg. She was given 3 L crystalloid (Ringer Lactate). And once she was stable and surgery was concluded, she was shifted to Post op where her vitals were stable and later shifted to Intensive Care Unit. Later, a patch reaction test was performed. A positive wheal and erythema occurred to latex, but there was no reaction to oxytocin or bupivacaine.

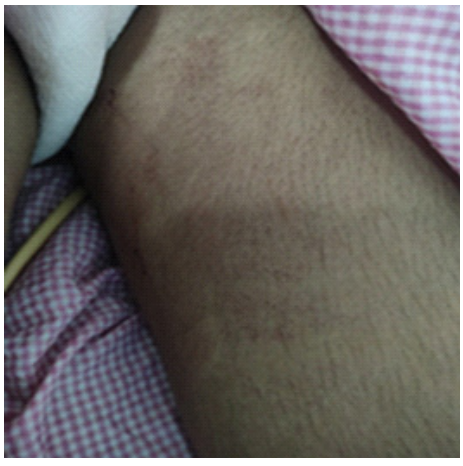

Figure 1: Latex skin allergy.

Discussion

The presented case illustrates a challenging scenario where the cause of the observed anaphylactic reaction, ostensibly triggered by oxytocin administration during caesarean section, remains unclear despite the patient's known latex sensitivity. While the symptoms aligned with an anaphylactic response and responded well to appropriate treatment, establishing oxytocin as the sole causative agent proved intricate due to the patient's concurrent sensitivity to latex. This overlap in allergic sensitivities posed a considerable challenge in definitively attributing the reaction solely to oxytocin or its constituents. Oxytocin-induced hypersensitivity reactions can manifest along a wide spectrum, from mild skin manifestations like urticaria and pruritus to severe anaphylaxis characterized by life-threatening symptoms such as bronchospasm and hypotension. However, in this case, the patient displayed severe symptoms, including pruritus, dyspnoea, and a dramatic drop in blood pressure, indicating a more severe reaction [4,5]. Differentiating between the allergic response to oxytocin itself and potential reactions induced by components within the medication remains a considerable hurdle. The lack of a direct reaction to oxytocin or the accompanying aesthetic, bupivacaine, in the subsequent patch test underscores this complexity. This ambiguity complicates the identification of the precise allergenic agent responsible for the observed anaphylaxis [7]. Nevertheless, the imperative lies in the prompt recognition of symptoms indicative of hypersensitivity reactions, regardless of the specific allergen. In such instances, the immediate cessation of oxytocin infusion and rapid initiation of appropriate treatment, including adrenaline, antihistamines, and steroids, are pivotal in averting further complications and ensuring the patient's safety [8]. The uncertainty surrounding the causative agent in this case underscores the importance of heightened vigilance among healthcare practitioners, particularly anaesthesiologists and obstetricians, during obstetric procedures involving oxytocin administration. It emphasizes the need for robust emergency preparedness, comprehensive preoperative screening for potential allergens, and established protocols for managing anaphylaxis to guarantee optimal patient care and safety in obstetric settings. Further research exploring potential allergenic components within oxytocin and their interactions with known allergens like latex is essential for refining diagnostic approaches and enhancing safety measures during obstetric interventions.

Conclusion

In conclusion, our findings suggest the need for particular attention in managing delivering women suffering from latex allergy. An accurate medical history, clinical and diagnostic evaluation, latex free anaesthesiologic setting, use of oxytocin-alternative agents is likely to reduce the risk of anaphylactic reactions in these women. This case highlights the importance of maintaining a high index of suspicion for hypersensitivity reactions when administering oxytocin, and it underscores the need for healthcare professionals to be prepared to manage such situations effectively. Further research is warranted to better understand the underlying mechanisms and risk factors for oxytocin-induced hypersensitivity reactions. Further in vitro studies are necessary to establish the occurrence of an immunologic cross-reaction between latex and oxytocin, and clinical studies are needed for a better understanding of and management of

respiratory and cardiac effects of oxytocin administration. Take home message from this is, whatever may be the cause of anaphylaxis it is important to correctly diagnose and prompt treatment is necessary.

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