



Misoprostol Usage for Postpartum Haemorrhage at Secondary Care, Nizwa Hospital

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INTRODUCTION/BACKGROUND

Postpartum haemorrhage (PPH) remains the leading cause of maternal mortality worldwide, accounting for approximately 70,000 deaths annually¹. Defined as blood loss ≥ 500 mL within 24 hours after delivery, or ≥ 1000 mL in severe cases, PPH is primarily caused by uterine atony and complicates 1–10% of all deliveries²⁻³. While significant reductions in maternal mortality have been achieved globally, PPH persists in low-income countries due to the prevalence of home births and limited access to lifesaving interventions⁴⁻⁶. Even in high-income settings, trends in retained placenta and PPH are reportedly rising⁷⁻⁸.

Misoprostol, a prostaglandin E1 analogue, has become a critical uterotonic in the management of PPH, especially where oxytocin—the preferred first-line treatment—is not available or feasible due to cold-chain storage requirements⁹⁻¹⁰. Its benefits include heat stability, long shelf life, and multiple routes of administration (sublingual, oral, rectal, vaginal), which enhance its applicability in resource-constrained environments¹¹⁻¹⁴. Although globally used, misoprostol is not approved by the U.S. Food and Drug Administration (FDA) for PPH treatment⁶. Despite this, authoritative bodies including the World Health Organization (WHO), International Federation of Gynaecology and Obstetrics (FIGO), Royal College of Obstetrics and Gynaecology (RCOG) and American College of Obstetricians and Gynaecologists (ACOG) have endorsed its use as a standalone or adjunct treatment for PPH in low-resource settings¹⁵⁻¹⁸. In 2015, misoprostol was added to the WHO Essential Medicines List specifically for the prevention and treatment of PPH where oxytocin is unavailable¹⁹. Adverse effects such as shivering, fever, nausea, vomiting, and diarrhoea are commonly reported but are usually transient and manageable²⁰⁻²⁴. Pooled data from Cochrane reviews show elevated risks of shivering (RR: 2.25), pyrexia $\geq 38^{\circ}\text{C}$ (RR: 3.12), and vomiting (RR: 1.84) with misoprostol, particularly at higher doses²⁰.

While misoprostol is widely used globally, its real-world application patterns in Oman remain under-documented. Previous research, such as the five-year cross-sectional study by Fenn et al. at a tertiary hospital in Oman, described overall PPH incidence but did not focus on uterotonic trends²⁵. There remains a critical evidence gap regarding how misoprostol is being utilized in secondary care contexts—such as Nizwa Hospital—for both prevention and treatment of PPH.

OBJECTIVES/AIMS

To study the increase in Misoprostol, use in obstetrics cases, both prophylactic (P) and therapeutic (T), for postpartum haemorrhage (PPH) during the first six months of 2024 compared to the same period in 2023.

METHODS

At Nizwa Hospital, misoprostol is used in gynaecological cases for the medical management of miscarriages and preoperative cervical priming, and in obstetric cases for PPH, both prophylactically (P) and therapeutically (T). This study focused specifically on misoprostol use for PPH, emphasizing usage trends rather than dosing protocols. As a non-approved drug requiring regulatory oversight, usage data was obtained from the Alshifa system with assistance from the clinical pharmacist. Data analysis was performed using SAS Studio. Statistical significance was assessed using two-proportion z-tests, and a Chi-square test of association between year and treatment type.

ACKNOWLEDGEMENT

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DISCLOSURE

The Authors declare no conflict of interest and No funding was received for this study.

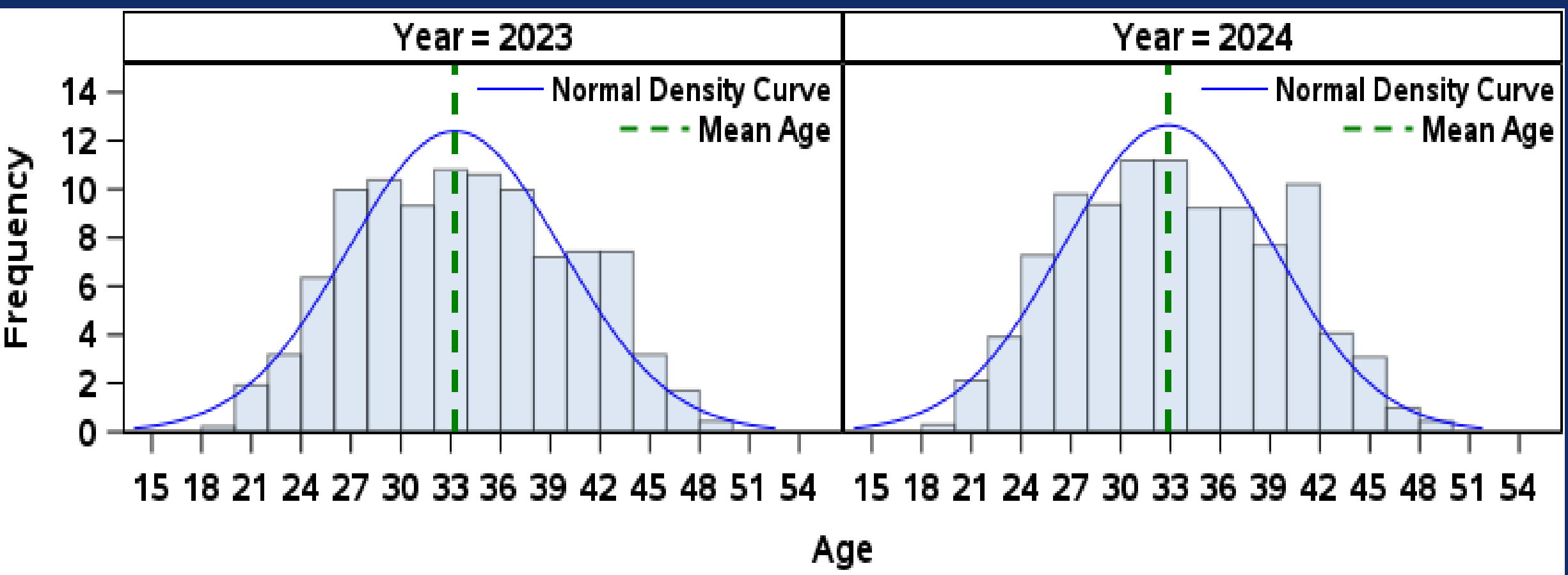


Figure 1. Age distribution of obstetric patients who received misoprostol in 2023 and 2024.

Year	January	February	March	April	May	June	Total
2023	458	421	424	413	472	458	2646
2024	487	382	371	399	435	441	2515

Table 1. Monthly and total delivery distribution for year 2023 and 2024

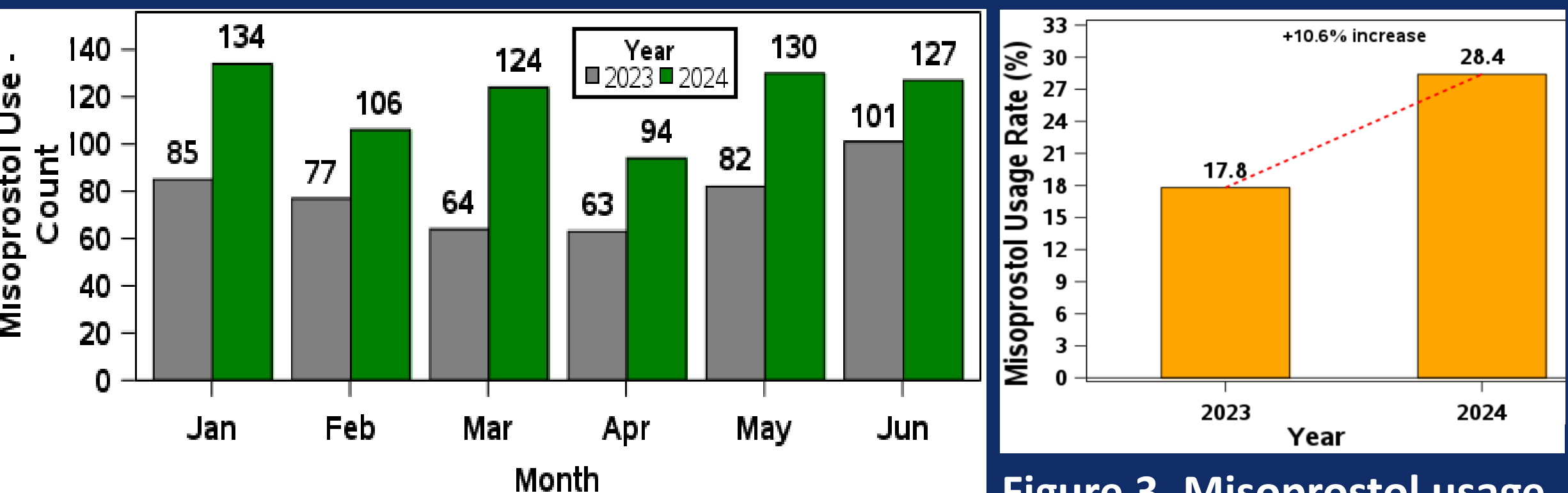


Figure 2. Monthly misoprostol use among obstetric patients in 2023 and 2024.

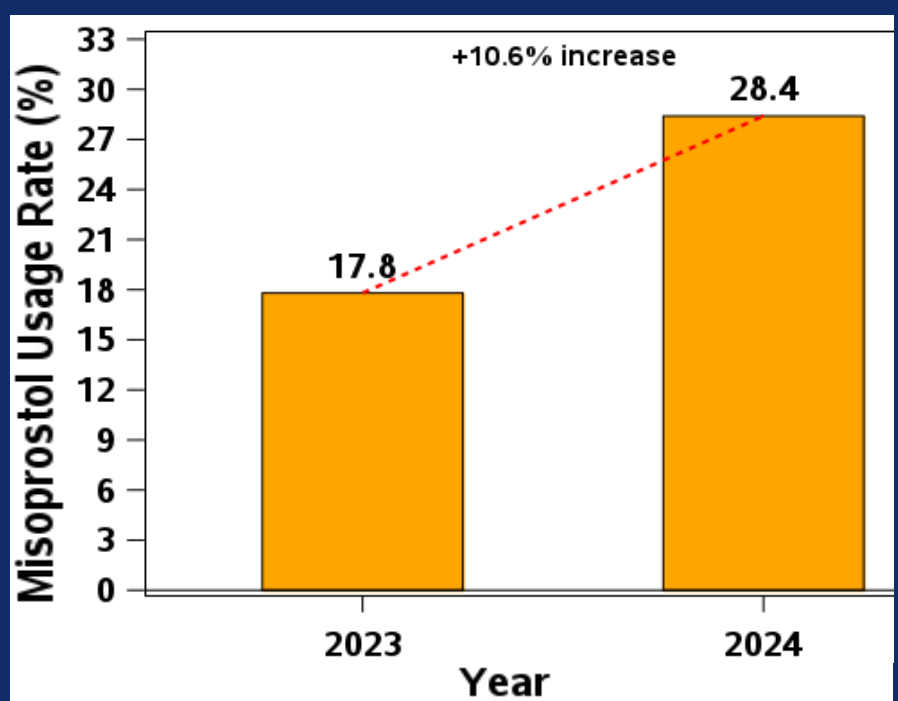


Figure 3. Misoprostol usage rate in obstetric deliveries in 2023 and 2024

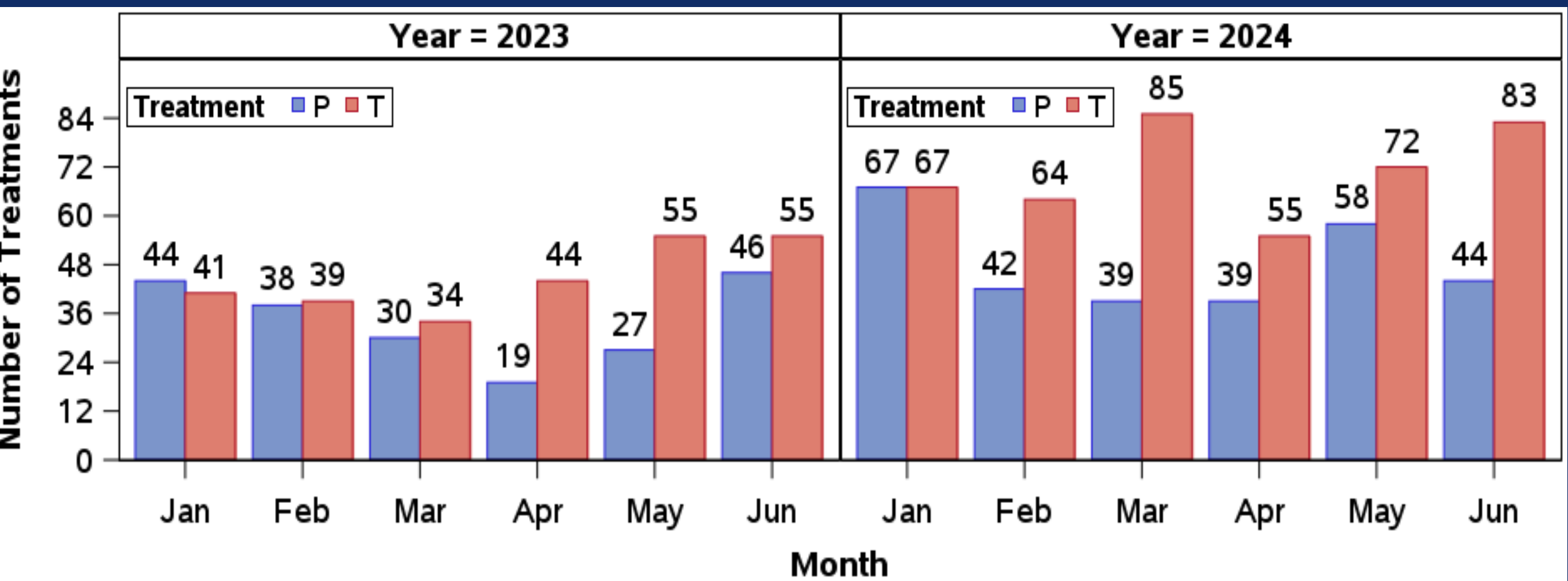


Figure 4. Monthly distribution of prophylactic (P) and therapeutic (T) misoprostol treatments among obstetric patients from January to June in 2023 and 2024.

RESULTS

- Misoprostol was used in 2,187 cases during the study period (971 in 2023 and 1,216 in 2024), of which 1,000 (45.7%) were gynaecology cases and 1,187 (54.3%) were obstetrics cases.
- The analysis focused on 1,187 obstetric PPH cases: 472 in 2023 and 715 in 2024.
- The mean age of women in both years was 33 years (*see Figure 1*).
- Total deliveries during the first six months declined from 2,646 in 2023 to 2,515 in 2024, a 5% decrease (*see Table 1*).
- Misoprostol was used in 472 PPH cases in 2023 and 715 cases in 2024 (*see Figure 2*).
- Misoprostol was used for PPH in 17.8% of deliveries in 2023, increasing to 28.4% in 2024, indicating a significant increase in usage over time (*see Figure 3*).

Statistical analysis

Misoprostol Use Increased Over Time

- Misoprostol use rose from 17.8% in 2023 (472/2646) to 28.4% in 2024 (715/2515) (*see Figure 3*).
- This 10.6 percentage point increase was statistically significant ($z = -9.04$, $p < 0.0001$), indicating greater adoption over time.

Prophylactic Use: Increase in Count, Not Proportion

- Prophylactic use of Misoprostol for PPH in 2023 was 204 cases compared to 289 in 2024, showing an increase of 41.6%.
- Prophylactic use for PPH in 2023 was 204/472(43.2%) cases compared to 289/715(40.4%) in 2024, showing an increase in usage.
- However, the proportion among misoprostol recipients declined from 43.2% to 40.4%, indicating a shift toward therapeutic use. This decrease was not statistically significant ($z = -0.96$, $p = 0.388$).

Therapeutic Use: Slight Increase

- Therapeutic use of Misoprostol for PPH in 2023 was 268 cases compared to 426 in 2024, showing an increase of 58.9 %.
- Therapeutic use for PPH rose from 56.8% in 2023 (268/472) to 59.6% in 2024 (426/715), in proportion.
- This increase was not statistically significant ($z = -0.96$, $p = 0.34$), but may suggest a gradual trend toward more clinical applications.

Chi-Square Test (Year $\times$ Treatment)

- A chi-square test comparing treatment distribution across years showed no significant difference ($p = 0.34$) when looking only at treatment categories (P vs T).
- However, proportion-based usage analysis revealed significant increase in misoprostol uptake.

DISCUSSION AND CONCLUSIONS

Misoprostol is an effective therapy for PPH, and its application is changing with positive impact, so clinical guidelines and treatment protocols should be updated to reflect the current knowledge on the efficacy of misoprostol in the various routes and doses for the treatment of PPH. PPH is an obstetric emergency complicating 1–10% of all deliveries and remains the leading cause of maternal death³.

Our study demonstrates that misoprostol's use as a second- or third-line medication for PPH prevention and management has increased. This observed trend aligns with global recommendations for Misoprostol's expanded use. Further research on Carbetocin, a heat stable synthetic octa-peptide with a half-life of about 42 minutes (an analogue of oxytocin) use in PPH management is recommended, as it is recently being introduced at Nizwa Hospital²⁶.

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