

Evaluation of prophylactic antimicrobial use following assisted vaginal delivery at a tertiary obstetric hospital

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Background

The ANODE trial, a multicentre randomised controlled trial, investigated whether prophylactic antimicrobials prevented postpartum infection after assisted vaginal delivery (AVD).¹ It demonstrated that a single dose of intravenous amoxicillin-clavulanate administered within 6 hours after assisted vaginal delivery (AVD) reduced the risk of infection in the first 6 weeks postpartum.

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) and Western Health guidelines recommend administration of prophylactic amoxicillin-clavulanate after AVD.^{2,3}

Local guidelines include alternative recommendations for patients with antibiotic allergies.

Aim

The primary aim of this study was to review the appropriateness of prescribing and compliance of prophylactic antimicrobial use following AVD at Joan Kirner Women's and Children's at Sunshine Hospital (Western Health), with current recommendations.

The secondary aim was to evaluate the prescribing practices for patients with antimicrobial allergies.

Method

A retrospective audit of electronic medical records was undertaken for all patients who gave birth via AVD from July to December 2022. Data was collected in Excel and included: date and time of delivery; antibiotic allergies and reaction type; whether prophylactic antimicrobials were prescribed; choice of antimicrobial; dose, route and timing of antimicrobial administration; and diagnosis of peripartum or postpartum infection. Patients who received triple antimicrobial therapy for suspected chorioamnionitis were excluded from the study.

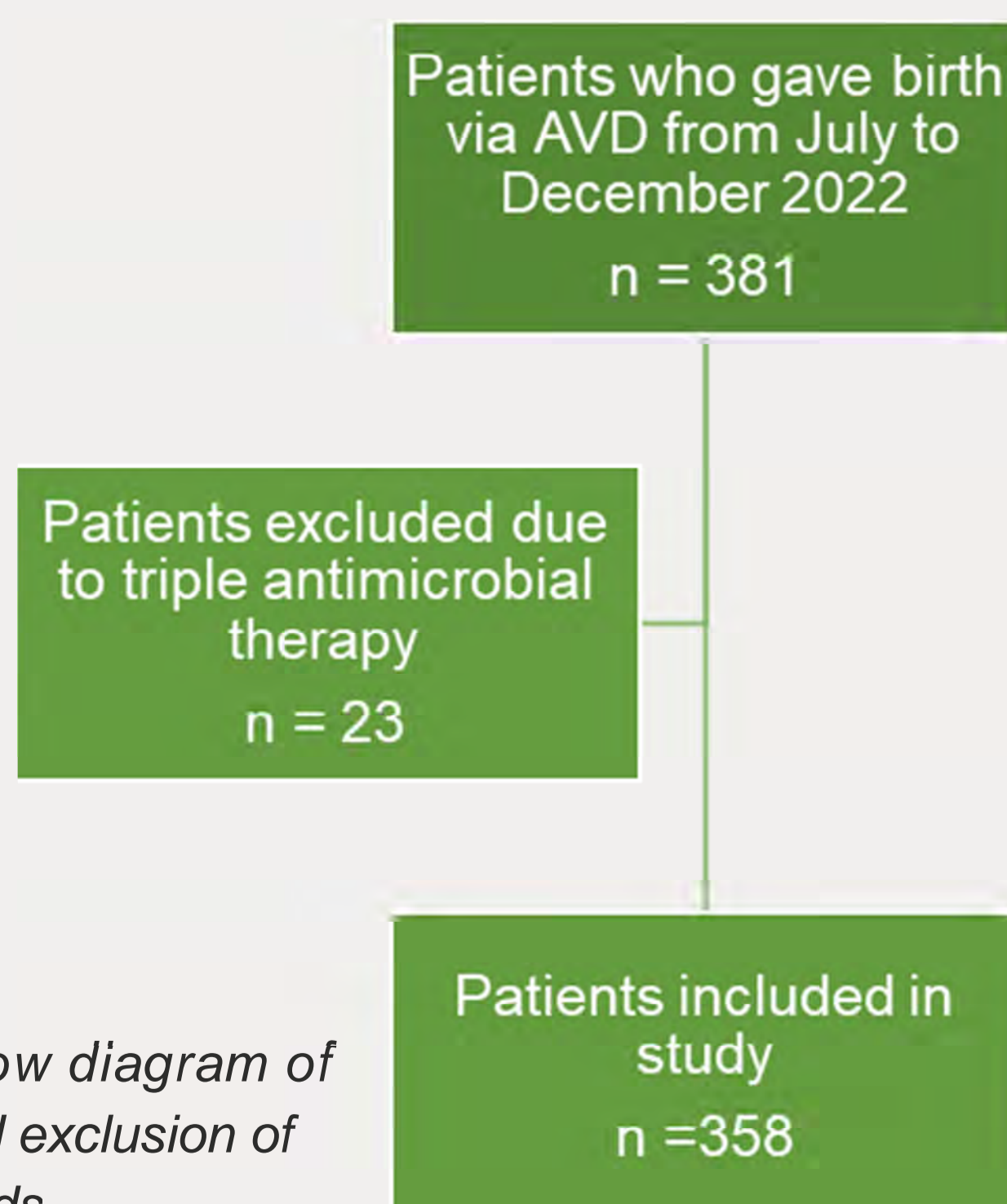


Figure 1: Flow diagram of inclusion and exclusion of patient records

Results

Medical records were reviewed for 381 patients who delivered via AVD during the study period. Twenty-three patients with peripartum infection were excluded from data analysis as they were prescribed antibiotics for suspected chorioamnionitis.

Prescribing and administration practices

Prophylactic antimicrobials were prescribed for 78.5% (281/358) of all included patients, however, only 68.4% (245/358) of all patients received the correct antimicrobial within 6 hours postpartum aligning with recommended guidelines (Figure 2).

Of the patients who were prescribed the correct prophylactic antimicrobial, 6% (17/281) were not administered their prophylactic antimicrobials within 6 hours (Figure 2).

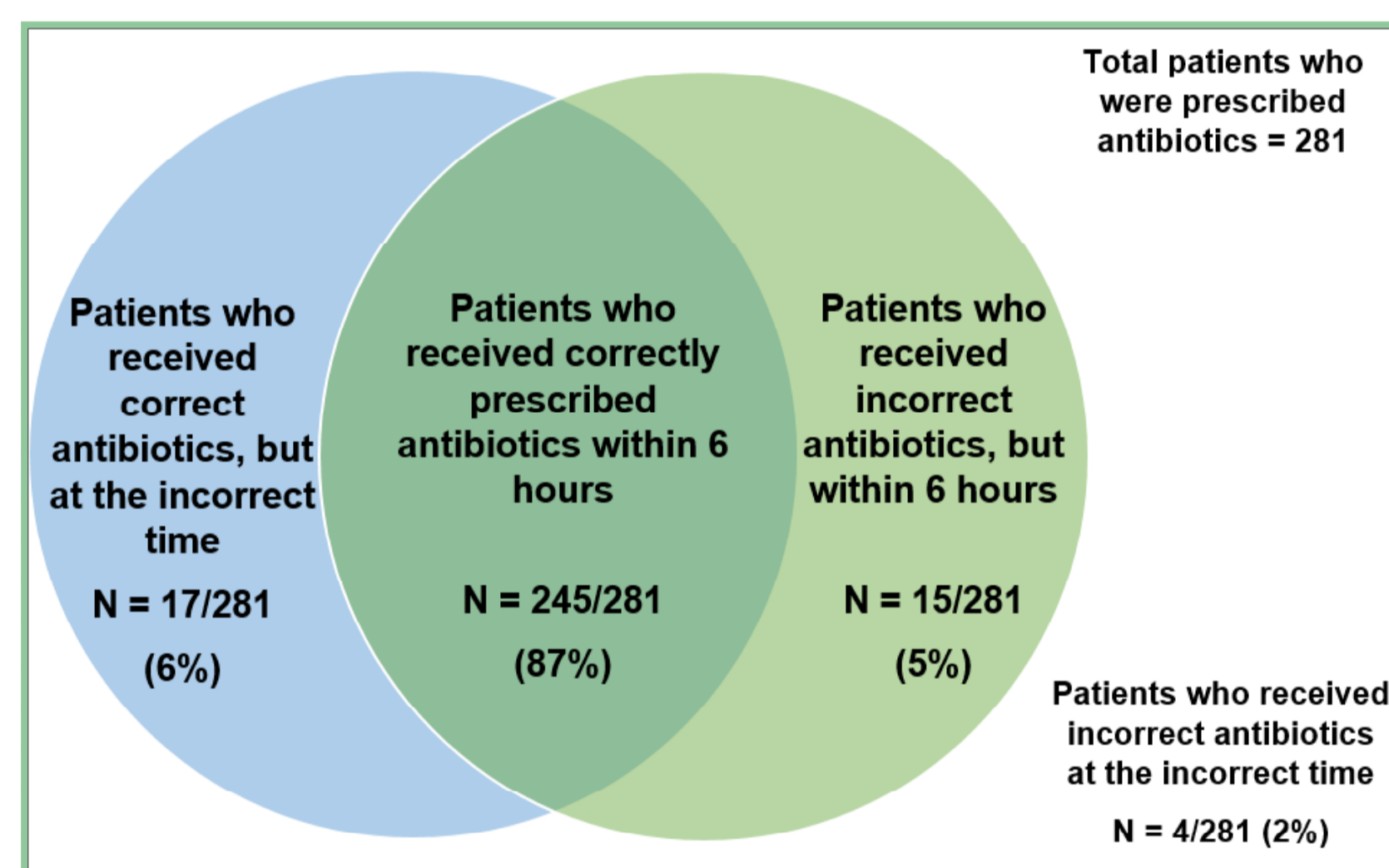


Figure 2: Appropriateness and timing of antibiotic administration

The reasons for guideline deviation are summarised in Figure 3.

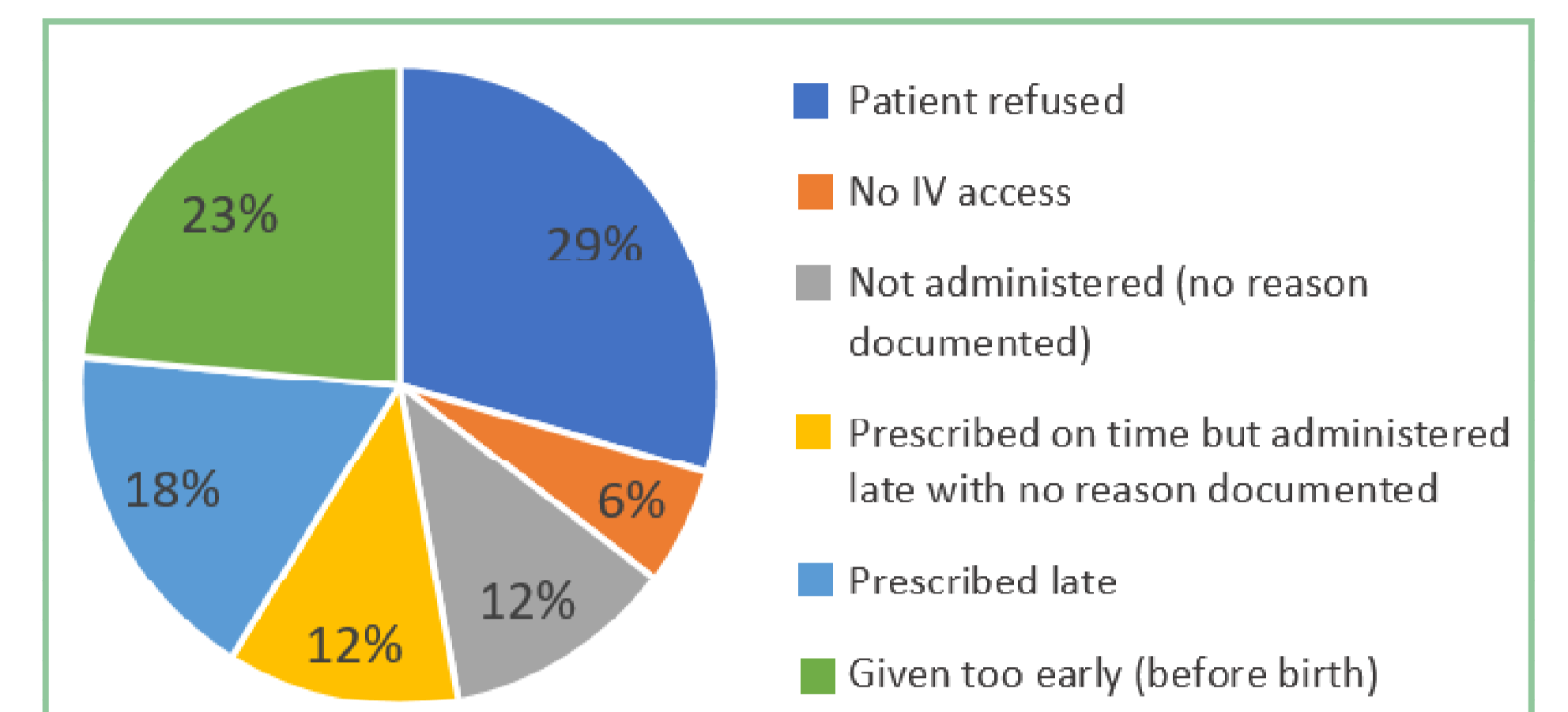


Figure 3: Reasons why prophylactic antimicrobials were not administered within 6 hours of AVD when prescribed correctly

Incidence of postnatal infection

No patients who received antibiotics according to recommendations were readmitted with postnatal infection, compared to 2.4% (2/85) of patients who did not receive prophylactic antibiotics.

Prescribing for patients with antibiotic allergies

Only 50% (7/14) of patients with penicillin or cephalosporin allergy were prescribed antimicrobial prophylaxis, compared to 79.7% (274/344) of patients without these allergies.

Patients with these allergies were prescribed clindamycin except for one patient who received amoxicillin-clavulanate. None of the patients with penicillin or cephalosporin allergies received gentamicin, which is recommended to be used together with clindamycin.

Weekday and weekend prescribing practices

There was minimal difference in guideline compliance when prescribing occurred on weekdays compared to weekends/public holidays. On weekdays, 88.5% (185/209) of patients received antimicrobial prophylaxis compliant with guidelines compared to 83.3% (60/72) on weekends/public holidays.

Discussion

This study demonstrates the need to increase obstetrician and midwife awareness of recommendations, particularly for patients with antibiotic allergies.

Furthermore, this study suggests there may be a protective effect against postpartum infection with prophylactic antimicrobial administration, irrespective of deviation from current recommendations such as incorrect prescribing and untimely administration. However, this is a single-site study, and patient numbers are relatively small.

Additionally, the study shows that the day of the week in which AVDs occurred does not significantly influence antimicrobial prescribing patterns and guideline compliance. This may suggest that non-compliance to guidelines is not related to low staff levels, but rather the limited awareness of the guideline for antimicrobial prophylaxis post AVD at Western Health.

Conclusion

This study highlights an emerging opportunity for pharmacists embedded within the multidisciplinary birth suite team to optimise timely administration of appropriate prophylactic antimicrobials to reduce the risk of infection and readmission following AVD.

References

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2. Western Health Guideline: Assisted Vaginal Birth — Vacuum or Forceps. 2023.
3. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). Statement: Instrumental vaginal birth. 2020. <https://ranzco.org.au/wp-content/uploads/2022/05/Instrumental-vaginal-birth.pdf>. Accessed: 02/06/2023.