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Penggunaan Antibiotik pada Persalinan dengan Induksi: Studi di RSUD Majenang dan RSUD M. A. Sentot Patrol

Antibiotic Use in Induced Labour: A study at RSUD Majenang and RSUD M. A. Sentot Patrol

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ARTIKELINFO

ABSTRAK

Kata Kunci: Penggunaan antibiotik, induksi persalinan, akurasi ketepatan, RSUD M. A. Sentot Patrol, RSUD Majenang

Keywords:

Antibiotics use, induced labour, accuracy, RSUD M. A. Sentot Patrol, RSUD Majenang Penggunaan antibiotik yang tidak rasional akan meningkatkan kemungkinan resistensi bakteri terhadap antibiotik di masa depan. Antibiotik umumnya diresepkan untuk wanita selama persalinan, bahkan bagi mereka yang menjalani persalinan dengan induksi. Pemberian antibiotik selama persalinan dianjurkan jika ada risiko tinggi bayi tertular infeksi. Penelitian ini bertujuan untuk menilai ketepatan indikasi, pasien, obat, dosis dan cara pemberian antibiotik pada persalinan dengan induksi di RSUD Majenang dan RSUD M. A. Sentot Patrol. Penelitian ini dilakukan dengan menggunakan pendekatan observasional deskriptif non eksperimental. Data dikumpulkan secara retrospektif (Januari - Desember 2022). Analisis dilakukan dengan menggunakan Pedoman Penggunaan Antibiotik dan Pedoman Nasional Penanggulangan Komplikasi Kehamilan oleh Kementerian Kesehatan. Temuan disajikan dalam bentuk tabel dan persentase. Sebanyak 96 pasien di RSUD Majenang dan 71 pasien di RSUD M. A. Sentot memenuhi kriteria inklusi. Semua parameter yang terkait dengan indikasi, pasien, obat, dosis dan cara pemberian 100% akurat dalam mengevaluasi penggunaan antibiotik dalam induksi persalinan di RSUD Majenang. Sebaliknya, ketepatan indikasi dan pasien di RSUD M.A. Sentot Patrol sebesar 40,58%. Untuk ketepatan obat sebesar 0%, hanya dosis dan cara pemberian antibiotik yang 100% tepat di RSUD M. A. Sentot Patrol. Kesimpulannya, penggunaan antibiotik pada persalinan induksi di RSUD Majenang sudah memenuhi harapan, sedangkan di RSUD M. Patrol masih ada ruang untuk perbaikan.

ABSTRACT

The irrational use of antibiotics augments the probability of bacterial resistance to antibiotics in the future. Antibiotics are commonly prescribed to women during labour, even those who undergo induced labour. Antibiotic administration during labour is recommended in the presence of an elevated risk of the baby contracting an infection. This study aimed to assess the accuracy of the indications, the patients, the drugs, the doses and the administration methods of antibiotics in induced labour in RSUD Majenang and M. A. Sentot Patrol. This research was conducted using a descriptive, non-experimental, observational approach. The data were collected retrospectively (January - December 2022). Analysis was conducted using Guidelines for Antibiotic Use and National Guidelines for Managing Pregnancy Complications by the Ministry of Health. The findings were presented in tables and percentages. 96 patients in RSUD Majenang and 71 patients in RSUD M. A. Sentot patrol fulfilled the inclusion criteria. All parameters related to indications, patients, drugs, doses and administration methods were 100% accurate in evaluating antibiotic use in labour induction at RSUD Majenang. In contrast, the accuracy of indications and patients in RSUD M A. Sentot Patrol was 40.58%. For the accuracy of drugs, it was 0%, with only the dose and method of antibiotic administration being 100% correct at RSUD M. A. Sentot Patrol. In conclusion, the utilization of antibiotics in inducted labour at RSUD Majenang has met expectations, while at RSUD M. Patrol, there is room for improvement.

1. Pendahuluan

The Indonesia Health Profile of 2021 reveals that 207 cases of maternal deaths occurred as a result of infection, with West Java, East Java, and Central Java having the highest maternal mortality rates (MMR) due to infection in Indonesia (Indonesia Ministry of Health, 2021). As per the report, MMR in Cilacap Regency, Central Java, remains high. In 2019, 15 maternal deaths were reported in several areas of Cilacap Regency, including the Majenang sub-district (Nastuti,

Received 24-02-2024; Received in revised form 24 February 2024; Accepted 20-06-2024; Available online 13-08-2024 E-mail address: <u>anjarmahardian@ump.ac.id</u> 2020). Furthermore, in 2020, Indramayu Regency, located in West Java, presented a total of 38 cases of MMR (Indramayu Regency Health Office, 2020). This data demonstrates that MMR still demands attention as a persisting issue.

Complications of childbirth, in addition to infections, account for maternal deaths. The World Health Organization reported 287,000 deaths in 2020 due to such complications (WHO, 2022). Some labour difficulties require drug induction or surgery (WHO, 2023). The objective of induction is to facilitate natural vaginal delivery, thereby ensuring the safety of both the mother and the baby. Causes of labour induction include hypertension and diabetes during pregnancy, premature rupture of membranes, under-term labour, and fetal-endangering factors (WHO, 2022).

Antibiotic administration during labour is recommended in the presence of an elevated risk of the baby contracting an infection. Antibiotics may be administered to pregnant women before or after labour, whether they are delivered vaginally or via cesarean section. The administration of antibiotics must be rational to reduce maternal mortality rates and the risk of future antimicrobial resistance (AMR) (Indonesia Ministry of Health, 2015). Antibiotic use during pregnancy and childbirth has been evaluated through qualitative and quantitative methods. According to Kusuma et al. and Maulidya et al., the use of antibiotics during childbirth, particularly in cases of cesarean section, requires improvement (Kusuma et al., 2016; Maulidya et al., 2022). However, studies on the use of antibiotics during induced labour still need to be expanded, highlighting the need for further in-depth research.

2. Methods

Study design

This study used a descriptive non-experimental research method because it did not intervene in the test subjects. Designed a descriptively observational study that will describe the pattern of drug use and rationality of antibiotic use in labour with induction. Retrospective data collection involved searching and gathering medical records of pregnant women who underwent induction of labour due to premature rupture of membranes at RSUD Majenang and preeclampsia at RSUD Pantura M.A Sentot Patrol from January to December 2022. This study has obtained approval from the health research ethics committee of Universitas Muhammadiyah Purwokerto with the reference numbers KEPK/UMP/48/I/23 and KEPK/UMP/49/I/23.

The study sample

The participants in this study were female patients who underwent induction of labour and met the pre-specified inclusion and exclusion criteria. The inclusion criteria required the population at RSUD Majenang to be utilized for this study. Patients diagnosed with premature rupture of membranes, who underwent induction of labour and received antibiotic prescriptions, had successful vaginal deliveries at RSUD Majenang. For this study, the population inclusion criteria at RSUD Pantura M.A Sentot Patrol comprise inpatients diagnosed with pre-eclampsia during pregnancy who underwent induction of labour resulting in vaginal delivery at the same facility and were prescribed antibiotics. The exclusion criteria for the population at RSUD Majenang are patients with premature rupture of membranes who undergo induction of labour with incomplete medical record data (such as incomplete identity, missing laboratory data, or illegibility) and patients who have indications of other diseases, except for premature rupture of membranes, and undergo induction of labour. The study's population exclusion criteria at Pantura M. A. Sentot Patrol Hospital were pregnant patients with pre-eclampsia who underwent labour induction with incomplete medical records (missing identity or laboratory data) or illegible records, as well as patients who underwent labour induction with indications of other illnesses besides preeclampsia.

Data and data analysis

The data was collected from eligible patients' medical records using the abovementioned criteria. The collected data include age, indication for induction, the pattern of antibiotic usage during induction of labour, and take-home information. The data was entered into an Excel worksheet for data collection. The percentages were tabulated for the sociodemographic data, induction indications, and drug usage. Antibiotic usage data were compared to the Ministry of Health's antibiotic use guidelines concerning indications, drugs, patients, doses, and administration methods (Indonesia Ministry of Health, 2021). The analysis outcomes are presented as a percentage.

3. Results and Discussion

The success of the delivery of an infant is influenced by the age of the mother. According to data collected (Table 1), patients between 20 and 35 years of age were dominant in both locations. There is evidence of a correlation between age and successful labour induction (Yanuarini et al., 2022). Specifically, the optimal age range for pregnancy and childbirth is between 20 and 30 years, coinciding with the peak of female fertility and proper functioning of the reproductive organs (Wibowo et al., 2021). However, women over the age of 35 may experience reduced ability and elasticity of the reproductive system, which can impact their ability to conceive and carry a pregnancy (Sudarto et al., 2016). The female reproductive system may not be fully developed, and psychological maturity may not have been reached in mothers under the age of 20, resulting in a lack of preparedness to become mothers and accept pregnancy (Yanuarini et al., 2022). Mothers aged between 20 and 35 years showed the highest success rates for induction of labour, with a rate of 77.1% in another study (Puruhita et al., 2016).

Premature rupture of membranes is a frequently encountered indication for induction, with infection as one of its predisposing factors. In such cases, maintaining the pregnancy can be harmful to both the mother and fetus. It is particularly relevant when considering induced labour at RSUD Majenang to manage premature rupture of membranes beyond 35 weeks of gestation; induction is the preferred method, followed by cesarean section if necessary (Reni et al., 2016). A study by Sari Trihapsari et al. established a correlation between maternal age and premature rupture of membranes (Trihapsari et al., 2021).

Table I. Patient characteristics

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Characteristics	RSUD Majenang		RSUD M. A. Sentot					
	(n = 96)		(n =	(n = 71)				
	n	%	n	%				
Age (year)								
< 20	5	5,1	3	4				
20 - 35	80	83,4	36	50				
> 35	11	11,5	33	46				
Indication for induction								
Pre-eclampsia	-		71	100				
Premature labour rupture	96	100	-					
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Table 2. Antibiotics use in induced labour								
Antibiotics	RSUD Majenang		RSUD M. A. Sentot					
	(n = 96)		(n = 71)					
	N	%	N	%				
Prophylactic								
Ceftriaxone (IV); I g/ 24 H	96	100	0	0				
Cefotaxime (IV); I g/ 24 H	0	0	71	100				
Therapeutics								
Amoxicillin (PO); 500 mg/ 8 H	96	100	0	0				
Ciprofoxacine (PO) 500 mg/ 6 H	0	0	71	71				

Table 3. Evaluation of antibiotics use

Evaluation	RSUD Majenang		RSUD M. A. Sentot		
	(n = 96)		(n = 71)		
	n	%	n	%	

Indication				
Accurate	96	100	29	40,84
Inaccurate	0	0	42	59,15
Patients				
Accurate	96	100	29	40,84
Inaccurate	0	0	42	59,15
Drugs				
Accurate	96	100	0	0
Inaccurate	0	0	71	100
Doses				
Accurate	96	100	0	0
Inaccurate	0	0	71	100
Route of administra	tion			
Accurate	96	100	0	0
Inaccurate	0	0	71	100

Furthermore, pre-eclampsia is also an indication for considering labour termination. The case for the induction of labour at RSUD M.A. Sentot Patrol. For mothers with severe pre-eclampsia whose pregnancies have reached term, early delivery is recommended (Indonesia Ministry of Health, 2021; Ibnu, 2013). Correspondingly, in a case report study at Wonosari Yogyakarta Hospital, Mrs P, who had mild pre-eclampsia, underwent spontaneous vaginal delivery after being induced with a dose of 5 IU 20 tpm of oxytocin (Maydea, 2015).

A study carried out at Panti Wilasa Citarum Semarang Hospital demonstrated that inducing labour in severe pre-eclampsia patients did not increase the risk of section Caesarea and postpartum hemorrhage (Ivana et al., 2021). Antibiotics are essential to prevent amplification of the disease for instances such as premature rupture of membranes that pose an infection risk. However, there is no need for antibiotic treatment for the termination of pregnancy in the absence of infection risk (Indonesia Ministry of Health, 2021). The pattern of antibiotic use in induced labour patients in both hospitals involved the prophylactic use of cephalosporin antibiotic Group 3. However, there were differences in the pattern of antibiotic use therapy (Table 2). RSUD Majenang used penicillin, while RSUD M.A. Sentot Patrol used cephalosporin for its antibiotic therapy.

Table 3 shows RSUD Majenang yielded superior results in terms of antibiotic use evaluation compared to RSUD M. A Sentot Patrol. Specifically, RSUD Majenang demonstrated higher accuracy in indications, patients, and drugs. The evaluation of drug accuracy revealed that all 71 patients in RSUD M. A. Sentot Patrol were unsuitable for the prescribed drugs. However, the dosage and administration method were 100% accurate in both hospitals.

This research examines delivery induction across varying indications. Appropriate antibiotic prescription warrants examination of antibiotic necessity for patients. Patients with preterm rupture of membranes require antibiotics due to the heightened risk of infection as the duration of rupture increases. It also increases the risk of cord compression (73.1%) and ascending infection (28.2%) in the fetus (Andalas et al., 2019). Inducted labour for pre-eclampsia with spontaneous vaginal birth is believed to be as safe as spontaneous birth without induction; thus, antibiotics to prevent infection are unnecessary. Table 3 reveals that only 40.84% of patients at RSUD M.A. Sentot had the correct indication owing to the rupture of membranes associated with pre-eclampsia. Nonetheless, antibiotics were not required for those without ruptured membranes (Indonesia Ministry of Health, 2021). It is in contrast to the accuracy at RSUD Majenang, where the indication was premature rupture of membranes. The indication accuracy achieved 100%, as shown in Table 3 (Indonesia Ministry of Health, 2021).

Confirming whether antibiotics are appropriate and safe is crucial. The accuracy of the patient's indication is directly linked to their

personal characteristics. Based on the data collected, there have been no reports of antibiotic hypersensitivity in RSUD Majenag and RSUD M. A. Sentot Patrol. However, administering antibiotics as a prophlaxis for the induction of labour in patients with pre-eclampsia is inappropriate as it does not necessitate antibiotics, which is the opposite of premature rupture of membranes (refer to Table 3) (Indonesia Ministry of Health, 2021). The use of ciprofloxacin is inconsistent with PMK RI No. 28 of 2021, which specifies antibiotic follow-up treatment of cefotaxime with amoxicillin 500 mg orally every 8 hours (Indonesia Ministry of Health, 2021). However, in the case of RSUD Majenang, which administers amoxicillin as a follow-up antibiotic for therapeutic purposes. Furthermore, the outcomes of this research align with the findings of previous studies conducted by Putri et al., (2022), which stated that amoxicillin is the most frequently administered antibiotic to postpartum patients. An earlier investigation was carried out at RSUP dr. Soetomo Surabaya also elaborated on this subject. Cefotaxime antibiotics are prescribed to patients diagnosed with premature rupture of membranes as they have been demonstrated to extend the latency period beyond 48 hours. In addition, they do not result in any disparities in infant mortality, weight at birth, or Apgar score (a metric used to assess newborn health) (Rasti et al., 2020). Cefotaxime belongs to the class of cephalosporins considered safe during pregnancy and is categorized as B by the FDA, among the third-generation cephalosporin class, cefotaxime has the best coverage of gram-positive bacteria. According to a study conducted in East Java, cefotaxime was generally more costeffective than ceftriaxone (Illahi et al., 2018). Additionally, another study confirms that breastfeeding mothers can safely take ciprofloxacin after childbirth, which is also included in this class of antibiotics (Putri et al., 2022). However, the use of this compound must be reconsidered, as it can be secreted through breast milk (Food and Drugs Administration, 2017).

Accuracy of dosing has a significant impact on the effectiveness of drug therapy. The results of the dosage accuracy assessment for both hospitals are in line with the Guidelines for the Use of Antibiotics PERMENKES RI No 28 of 2021. It aligns with research conducted at Jemursari Islamic Hospital Surabaya using cefotaxime antibiotic therapy at a dose of I gram every 8 hours intravenously (Rosyada et al., 2022). The dose of cefotaxime is 1-2 grams every 4-12 hours by intravenous administration, and the dose of ciprofloxacin is 250-750 mg every 12 hours by oral administration (Amanda et al., 2014). Sileshi et al. also reported the same results, namely using ceftriaxone at a dose of I gram with the highest frequency of 2 times administration (Sileshi et al., 2016).

Last but not least drugs route administration will affect its efficacy and safety. Based on the evaluation of the rationality of the appropriate route of administration of antibiotic drugs, the selection of drug administration routes is carried out by the dosage form. The results of the study obtained 100% accuracy of the route of administration for both hospitals, as reported from research at Jemursari Islamic Hospital Surabaya using cefotaxime antibiotic therapy for intravenous injection at a dose of I gram every 8 hours (Rosyada et al., 2022). In another study, Sileshi et al. stated that ceftriaxone is a third-generation broadspectrum cephalosporin antibiotic for intravenous and intramuscular administration (Sileshi et al., 2016). The route of administration used for amoxicillin is peroral, in line with the results of research conducted by Putri et al., which explains that the use of amoxicillin antibiotics is given personally in postpartum patients (Rasti et al., 2020). Accuracy of route of administration could be more appropriate, as each manufacturer has provided appropriate instructions for use and labeling. 4. Kesimpulan

In conclusion, using antibiotics in induced labour at RSUD Majenang has met expectations, while there is still room for

improvement at RSUD M. Patrol. This study still has some limitations, such as the decision to use antibiotics in patients with indications for induction of pre-eclampsia without premature rupture of membranes. Hence, a prospective data collection approach with cohort studies can be considered for future study.

5. Daftar Pustaka

- Amanda et al., 2014. Drug Information Handbook, 23rd Edition. Lexi-Comp.
- Andalas M, Maharani CR, Hendrawan ER, Florean MR, Zulfahmi Z. 2019. Premature rupture of membranes and its management. Kedokteran Syiah Kuala Journal, 19(3).
- Food and Drugs Administration. 2017. Ciprofloxacin Use by Pregnant and Lactating Women. Accessed on 5 December from https://www.fda.gov/drugs/bioterrorism-and-drug-
- preparedness/ciprofloxacin-use-pregnant-and-lactating-women
- Ivana Hartanto A, Ririel Kusumosih TA, Indrarto W. 2021. Pregnancy and childbirth outcomes in mothers with severe pre-eclampsia at Panti Wilasa Citarum Hospital, Semarang. Indonesian Journal of Obstetrics & Gynecology Science, 4(1), 20–27.
- Illahi R, Pramestutie H, Susilaningtyas W. 2018. Cost-effectiveness analysis of cefotaxime, ceftriaxone, and levofloxacin in the treatment of typhoid fever: A study from Kanjuruhan Hospital, Malang, Indonesia. Value in Health, 21, S65.
- Indramayu District Health Service. 2020. Profile of the Indramayu District Health Service in 2020. Accessed on 5 December from https://dinkes.indramayukab.go.id/wp-content/uploads/2021/09/Profil-Kesehatan-2020.pdf
- Kusuma AM, Galistiani GF, Wijayanti DN, Umami M, Utaminingrum W. 2016. Quantitative evaluation of antibiotic use in caesarean section patients in regional hospitals throughout Banyumas Regency. Jurnal Farmasi Indonesia 8(1).
- Maulidya NN, Yulia R, Herawati F. 2022. Literature review: Patterns of prophylaxic antibiotic use in patients with caesarea sectio delivery. *Biomedika*, 14(1), 33–45.
- Maydea C. 2015. Midwifery Care for NY. P Mothers with Mild Pre-eclampsia at Wonosari Regional Hospital, Yogyakarta. Tesis. Yogyakarta: Sekolah Tinggi Ilmu Kesehatan Alma Ata
- Ministry of Health, Indonesia. 2013. Maternal Health Services in Basic and Referral Health Facilities.
- Ministry of Health, Indonesia. 2015. Wise and Rational Use of Antibiotics Reduces the Burden of Infectious Diseases. Accessed on 5 December from https//farmalkes.kemkes.go.id/2015/08/penggunaan-antibiotik-bijak-danrasional-kurangi-beban-penyakit-infeksi/
- Ministry of Health, Indonesia. 2021. The Republic of Indonesia Minister of Health Regulation Number 28 of 2021 concerning Antibiotics Use Guidelines.

Accessed on 5 December from https://yankes.kemkes.go.id/unduhan/fileunduhan_1658480966_921055.p df

- Ministry of Health, Indonesia. 2021. Indonesian Health Profile. Accessed on 5 December from https://www.kemkes.go.id/id/profil-kesehatan-indonesia-2021
- Nastuti A. 2020. Maternal and Infant Mortality Rates in Cilacap Regency are Still High. Accessed on 5 December from https://cilacapkab.go.id/v3/angkakematian-ibu-dan-bayi-di-kabupaten-cilacap-masih-tinggi/
- Puruhita A, Lathifah N, Desilestia DS. 2016. Factors Associated with Failed Labor Induction. Skripsi. Kendari: Politeknik Kesehatan Kendari
- Putri AA, AI Farisyi J, Saputra TH, 2022. Profile of antibiotic use in normal postdelivery patients at the Griya Sehat Friends of Mother Jember Maternity Home. urnal Farmasi dan Manajemen Kefarmasian, 1, 8–14.
- Rasti SD, Rochmanti M, Primariawan RY. 2020. Cefotaxime vs ceftriaxone for the management of preterm premature rupture of membranes. The International Arabic Journal of Antimicrobial Agents, 10(1).
- Reni R, Sunarsih. 2016. The effectiveness of vaginal administration of misoprostol with Intravenous oxytocin on the progress of labor in women giving birth indications at Asy-Syifaa Islamic Hospital Bandar Jaya in 2016. Jurnal Kebidanan Malahayati, 3.
- Rosyada A, Rachmawati AD, Maisaroh DE. 2022. Appropriate Profile of Antibiotic Therapy in Patients with Premature Rupture of Amninos at Jemursari Islamic Hospital, Surabaya. *Jurnal Ilmiah Mahaganesha*, I (2).
- Sileshi A, Tenna A, Feyissa M, Shibeshi W. 2016. Evaluation of ceftriaxone utilization in medical and emergency wards of Tikur Anbessa specialized hospital: A prospective cross-sectional study. BMC Pharmacology and Toxicology, 17(1), 7.
- Sudarto T. 2016. Risk of premature rupture of membranes in pregnant women with sexually transmitted infections. *Jurnal Vokasi Kesehatan*, 11(2), 126– 131.
- Trihapsari D, Agustina T, Lestari N, Raharja S. 2021. Relationship of mother's age and parities on the event of early premature rupture of membranes in PKU Muhammadiyah Surakarta Hospital. Alhamdic Conference Proceeding, 1, 136-145.
- World Health Organization (WHO). 2022. WHO Recommendations on Induction of Labour, et or Beyond Term. Accessed on 5 December from https://www.who.int/publications/i/item/9789240052796
- World Health Organization (WHO). 2023. Maternal Mortality. Accessed on 5 December from https://www.who.int/news-room/factsheets/detail/maternal-mortality
- Wibowo MINA, Sugiri MP, Arrista B, Setiawan D. 2021. Off-label use of misoprostol in obstetrics-gynecology patients in district private hospitals, Banyumas. Jurnal Sains Farmasi & Klinis, 8(1), 9.
- Yanuarini TA, Kristianti S, Sari ELA. 2022. Mother's characteristics in successful oxytocin drip labor induction. Jurnal Wiyata: Penelitian Sains Dan Kesehatan, 9(1), 1.