

# LAMPIRAN

## Lampiran 1.

### **ANALISIS SECARA KUALITATIF PENGGUNAAN ANTIBIOTIK BERDASARKAN KRITERIA GYSSENS PADA PENDERITA SEPSIS NEONATUS DI UNIT RAWAT INAP NEONATAL RSUD SURAKARTATAHUN 2012**

#### ***QUALITATIVE ANALYSIS OF THE USE ANTIBIOTICS BASED ON CRITERIAGYSSENS IN PATIENTS SEPTIC NEONATES IN UNIT WARD NEONATES RSUD OF SURAKARTA IN 2012***

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#### **ABSTRAK**

Salah satu penyebab kematian terbesar pada neonatus di negara berkembang adalah sepsis neonatus. Bakteri merupakan salah satu penyebab penyakit ini, maka penggunaan antibiotik merupakan terapi utama pengobatan penyakit ini. Antibiotik bekerja secara bakterisid maupun bakteriostatik, dampak buruk dari tidak tepatnya pemberian antibiotika adalah resistensi bakteri patogen. sehingga biaya pengobatan menjadi tidak efisien. Tujuan penelitian ini adalah untuk menilai kualitas pengobatan meliputi penatalaksanaan penggunaan antibiotik dan banyaknya antibiotik yang digunakan. Penelitian bersifat non eksperimental (*Observasional*), dengan metode deskriptif. Data diperoleh dari rekam medis secara *retrospektif*. Digunakan teknik sampling *purposive sampling*. Kriteria inklusi: Pasien neonatus yang terdiagnosis akhir menderita sepsis, masih hidup dan mendapatkan terapi antibiotik. Analisis data menggunakan alur kriteria Gyssens. Hasilnya didapatkan 100 rekam medis dan diambil 65 rekam medis yang memenuhi kriteria inklusi. Hasil: termasuk tidak rasional sebanyak 56 kasus (86,15%) karena ada antibiotik lain yang lebih efektif, termasuk tidak rasional sebanyak 8 kasus (12,30%) karena ada antibiotik lain yang lebih sempit spektrumnya, termasuk tidak rasional sebanyak 1 kasus (1,53%) karena tidak tepatdosis.

**Kata kunci** : Sepsis neonatus, antibiotik, Metode Gyssens.

## ABSTRACT

*One of the leading causes of neonate's death in developing country is septic neonates. Bacteria are one of the causes of this disease. Thus, antibiotic usage is the main treatment of this disease. The antibiotic is bactericid or bacteriostatic. The negative impact of inaccurate antibiotic dosage is the resistance of pathogens bacteria. Then, the cost of the treatment will be inefficient. The purpose of this research is to measure the quality of medicinal treatment; (1) the use of antibiotic, and (2) the amount of used antibiotic. This research is non-experimental (observational) with descriptive methodology. The collected data is taken from retrospective medical records. Purposive sampling is used in this research. Inclusive criteria: the neonates patients with diagnosed septic were alive, and treated with antibiotic therapy. In the data analysis Gyssens criteria scheme is used. There were 100 medical records. 65 of the medical records which appropriate with the inclusive criteria were taken. As the result, 56 (86,15%) irrational cases due to there were another more effective antibiotic, 8 (12,30%) irrational cases due to there were another narrower spectrum antibiotic, 1 (1,53%) inappropriate case due to incorect dosage.*

**Key words:** *Septic neonates, antibiotic, Gyssens method.*

## Lampiran 2.

### EVALUASI PENGGUNAAN ANTIBIOTIKA PADA PENGOBATAN SEPSIS NEONATAL DENGAN METODA GYSSENS DI RSAD SALAK BOGOR TAHUN 2018

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#### **Abstract**

*Sepsis is an organ dysfunction that involves life caused by immune dysregulation against infection. The provision of appropriate antibiotics is one of the criteria in the management of sepsis. In neonatal sepsis patients. The study was conducted analytically with a prospective plot. A total of 34 samples of neonatal sepsis patients were monitored for drug therapy. The dominant characteristics of infants that determine sepsis are male babies with a percentage of 59%, including 62% Adequate Infant Weight (BBLC), 59% types of Early Onset Sepsis (EOS), 79% full term pregnancy and 62% normal delivery results. The most used antibiotics are a*

combination of ceftriaxone-gentamicin as much as 50%, ampicillin-gentamicin as a first-line combination of 35%, a single ceftriaxone 9% and a single ceftazidime and a combination of ceftazidime-gentamicin each 3%. Gyssens evaluation results reported the results of the rationality of antibiotics 18%, irrationality 82%. Statistical results show the value of sig obtained was  $0.912 > \alpha 0.05$ . This shows that  $H_0$  is accepted or that there is no relationship of rationality with the length of days settled. Rational or inappropriate use of a patient is faster or longer in healing.

**Keywords:** Use of antibiotics; neonatal sepsis; Gyssens method

### **Abstrak**

Sepsis merupakan disfungsi organ yang mengancam kehidupan yang diakibatkan oleh disregulasi imun terhadap infeksi. Pemberian antibiotika yang sesuai merupakan salah satu kriteria dalam tata laksana sepsis. Penelitian ini bertujuan untuk mengevaluasi penggunaan antibiotika pada pasien sepsis neonatal. Penelitian dilakukan secara observasi analitik dengan alur prospektif. Sebanyak 34 sampel pasien sepsis neonatal dilakukan pemantauan terapi obat. Karakteristik dominan bayi yang mengalami sepsis adalah bayi laki-laki dengan prosentase 59%, terdapat 62% Berat Badan Bayi Cukup (BBLC), 59% jenis sepsis Early Onset Sepsis (EOS), kehamilan cukup bulan 79% dan riwayat persalinan normal 62%. Penggunaan antibiotika terbanyak adalah kombinasi seftriakson-gentamisin sebanyak 50%, kombinasi ampicilin-gentamisin sebagai lini pertama sebanyak 35%, ceftriakson tunggal 9% serta ceftazidim tunggal dan kombinasi seftazidim-gentamisin masing-masing 3%. Hasil evaluasi Gyssens menunjukkan hasil kerasionalan antibiotika 18%, ketidakrasionalan 82%. Hasil statistik menunjukkan bahwa nilai sig yang didapat sebesar  $0.912 > \alpha 0.05$ . Hal ini menunjukkan  $H_0$  diterima atau tidak adanya hubungan rasionalitas dengan lama hari sembuh. Penggunaan rasional atau tidaknya tidak ada hubungannya dengan seorang pasien lebih cepat atau lebih lama dalam penyembuhan.

**Kata kunci :** Penggunaan antibiotika; sepsis neonatal; metoda Gyssens

### **Lampiran 3.**

#### **QUALITATIVE REVIEW OF ANTIBIOTIC USE FOR NEONATAL SEPSIS**

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## ABSTRACT

**Objective:** The aim of this study is to evaluate the antibiotic use in neonates with sepsis.

**Methods:** An observational retrospective study was conducted using medical records of neonates diagnosed with early-/late-onset sepsis who were prescribed antibiotics and who were treated in the neonatal intensive care unit (NICU) at the Dr. Cipto Mangunkusumo Hospital between January 1 and December 31, 2015. Patient records were screened for antibiotic use; qualitative analyses were performed using the Gyssens algorithm. Concordance of empirical antibiotic prescriptions with subsequent blood culture and sensitivity tests was evaluated.

**Results:** A total of 176 sepsis cases included 80 and 96 neonates with normal and low birth weights (LBWs), respectively. Ampicillin- sulbactam+gentamycin, which is indicated in local guidelines as the first-line antibiotic combination for neonatal sepsis, was most frequently prescribed. In the normal birth weight group, appropriate antibiotic use (Gyssens Category I) was found in 89.7% of cases, whereas Gyssens Category V (no indication) was found in 4.54% of cases. In the LBW group, 88.1% and 6.2% of cases were included in Gyssens Categories I and V, respectively. Only 17.5% and 13.5% cultured blood specimens from normal and LBW groups, respectively, yielded positive results; the most commonly identified bacteria were *Acinetobacter baumannii* and *Klebsiella pneumoniae*. All isolates were resistant to ampicillin-sulbactam; only 7.4% were sensitive to gentamicin.

**Conclusion:** Antibiotic use for neonatal sepsis in NICU in this study can be considered appropriate, suggesting proper implementation of antimicrobial guidelines. However, high rates of resistance to the first-line antibiotics for neonatal sepsis are concerning.

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**Keywords:** Antibiotic, Gyssens, Neonatal sepsis.

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### Lampiran 4.

#### EVALUASI PERESEPAN ANTIBIOTIKA DENGAN METODE GYSSENS PADA PASIEN INFEKSI SEPSIS NEONATAL PERIODE MARET-APRIL 2015 DI INSTALASI RAWAT INAP RUMAH SAKIT UMUM DAERAH PANEMBAHAN SENOPATI BANTUL YOGYAKARTA

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## INTISARI

Sepsis neonatal merupakan sindrom klinis penyakit sistemik akibat infeksi yang terjadi dalam satu bulan pertama kehidupan. Sepsis neonatal masih menjadi masalah besar di negara berkembang seperti Indonesia. Terapi utama sepsis neonatal yaitu menggunakan antibiotika. Peningkatan angka kejadian sepsis neonatal akan meningkatkan kebutuhan persepsan antibiotika. Tujuan penelitian ini adalah mengetahui evaluasi persepsan antibiotika pada pasien infeksi sepsis neonatal periode Maret-April 2015 di RSUD Panembahan Senopati Bantul Yogyakarta.

Jenis penelitian ini adalah observasional deskriptif dengan rancangan penelitian *case series* menggunakan data retrospektif. Metode evaluasi menggunakan metode Gyssens, yaitu suatu diagram alir yang memuat kategori- kategori untuk menentukan ketepatan persepsan antibiotika.

Hasil analisis 31 kasus didapatkan bahwa sepsis neonatal lebih tinggi terjadi pada neonatus laki-laki (58%), bayi berat lahir cukup (55%), riwayat usia kehamilan cukup bulan (65%), riwayat persalinan normal (61%), dan keadaan sewaktu pulang sembuh (97%). Jenis sepsis yang paling banyak terjadi adalah sepsis awitan diri (93%). Jenis antibiotika yang paling banyak diresepkan adalah ampicillin dan gentamisin, masing-masing 34%. Lima persepsan antibiotika termasuk kategori 0 yang berarti tepat menurut kriteria Gyssens, 10 kategori IIa, 12 kategori IIIa, 15 kategori IIIb dan 6 persepsan kategori IVa. Adanya ketidaktepatan persepsan antibiotika ini diperlukan pengawasan untuk meningkatkan ketepatan persepsan antibiotika.

Kata kunci: ketepatan, antibiotika, sepsis neonatal, Gyssens

## ABSTRACT

Neonatal sepsis is a clinical syndrome of systemic disease caused by infection occurring in the first month of life. Neonatal sepsis still becomes a big problem in developing country such as Indonesia. Main therapy of neonatal sepsis is using antibiotics. The increasing of the events number of neonatal sepsis will increase needs of the antibiotic prescriptions. The purpose of this study was to evaluate the accuracy of the antibiotic prescriptions to the neonatal sepsis patient during March to April 2015 period at Panembahan Senopati hospital.

This research type was observational descriptive with case series research design by using retrospective data. Evaluation method used Gyssens method. It was a flowchart which contained categories to determine antibiotic prescription accuracy.

The analysis result of 31 cases indicated that neonatal sepsis occurred in male neonates (58%), sufficient weight born babies (55%), sufficient pregnant age history (65%), early onset sepsis (93%), normal childbirth history (61%) and recovered return condition (100%). The most prescribed antibiotics is ampicillin- gentamicin (34%). This research found 5 antibiotics prescription included in category-0 that indicated accurate according to Gyssens criteria, 10 category-IIa, 12 category-IIIa, 15 category-IIIb, and 6 category-IVa. This miss accuracy of the antibiotic prescription needs controlling to improve the antibiotic prescription accuracy.

**Keywords: accuracy, antibiotics, neonatal sepsis, Gyssens**

## **Lampiran 5.**

### **Evaluasi Penggunaan Antibiotik dengan Kartu Monitoring Antibiotik Gyssens**

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Latar belakang. Masalah infeksi yang sering ditemui di ICU anak, disebabkan berbagai pemakaian antibiotik. Peningkatan penggunaan antibiotik diikuti dengan risiko penurunan kepekaannya sehingga perlu pengendalian pemakaiannya.

Tujuan. Evaluasi penggunaan antibiotik secara kualitatif di *Pediatric Intensive Care Unit* (PICU) dengan menggunakan alur Gyssens.

Metode. Uji potong lintang retrospektif dengan mengevaluasi penggunaan antibiotik melalui kartu monitoring serta dilakukan analisis dengan alur Gyssens di PICU dari tanggal 10 Februari 2012 sampai 31 Juli 2012.

Hasil. Selama kurun waktu 5 bulan, 233 pasien dirawat di ICU Anak RS. Cipto Mangunkusumo Jakarta dan 45 (19,3%) pasien menggunakan antibiotik. Penggunaan antibiotik terbanyak pada kelompok umur 1 bulan sampai 1 tahun. Pada 83 penggunaan antibiotik, 64 antibiotik dipakai sebagai terapi empiris, 11 definitif, dan 8 profilaksis. Lima antibiotik terbanyak yang digunakan adalah sefotaksim, amikasin, piperasilin tazobaktam, meropenem, dan metronidazol. Penggunaan antibiotik yang tepat (alur Gyssens kategori I) didapatkan pada 53% pasien yang dirawat di PICU.

Kesimpulan. Penggunaan antibiotik dengan justifikasi yang tepat dapat diterapkan dan diharapkan dapat menurunkan resistensi antibiotik, mengurangi beban biaya pasien serta meningkatkan kualitas pelayanan pasien di ICU Anak. Selain itu, diperlukan pelatihan pengambilan spesimen yang tepat secara berkala, serta dihimbau untuk mengisi formulir antibiotik secara tepat dan benar.

Sari *Pediatri* 2013;14(6):384-90.

**Kata kunci:** antibiotik, alur Gyssens, terapi empiris

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## Lampiran 6.

### **Evaluasi Rasionalitas Penggunaan Antibiotik pada Pasien Anak Rawat Inap di Rumah Sakit Universitas Tanjungpura Periode Januari-Juni 2018**

#### **Evaluation of Antibiotic Rationality for Pediatric Inpatient at Hospital of Tanjungpura University Period January – June 2018**

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#### **ABSTRAK**

Antibiotika merupakan golongan obat yang banyak diresepkan pada pasien anak. Penggunaan antibiotik yang tidak rasional dapat menyebabkan resistensi. Penelitian ini bertujuan mengevaluasi penggunaan antibiotik menggunakan metode DDD (*Defined Daily Dose*) dan metode Gyssens. Penelitian ini merupakan penelitian observasional dengan rancangan potong lintang (*cross sectional*) bersifat deskriptif. Pengumpulan data dilakukan secara retrospektif berdasarkan data rekam medis pasien anak rawat inap di Rumah Sakit Universitas Tanjungpura periode Januari-Juni 2018. Sampel yang diperoleh sebanyak sebanyak 63 pasien. Hasil penelitian menunjukkan bahwa golongan antibiotik terbanyak adalah sefalosporin generasi ketiga (78,40%). Berdasarkan metode DDD, nilai DDD tertinggi pada seftriakson sebesar 27,18 DDD/100 pasien-hari dan merupakan antibiotika yang paling sering diresepkan (48,86%). Disisi lain berdasarkan metode Gyssens, ditemukan penggunaan antibiotik yang tidak rasional. Jenis ketidakrasional tertinggi pada kategori V (82,53%). Berdasarkan metode DDD dan metode Gyssens, terdapat ketidaktepatan penggunaan antibiotika di rumah sakit tersebut.

**Kata Kunci :** antibiotik, anak, DDD, Gyssens.

#### **ABSTRACT**

Antibiotics are a class of drugs that are widely prescribed in pediatric patients. Irrational use of antibiotics can cause resistance. This study aimed to evaluate the use of antibiotics in inpatient pediatric patients using the DDD method (*Defined Daily Dose*) and the Gyssens method. This observational study used cross sectional method with descriptive design. Data is conducted retrospectively based on medical records of hospitalized pediatric patients at Tanjungpura University Hospital from January to June 2018. There were 63 patients in this research. The quantity of antibiotic use is calculated using the DDD / 100 day patient formula. The quality of using antibiotics is determined by the Gyssens method. The results of this research found that the most antibiotic group was third generation cephalosporins (78.40%). The highest DDD value on ceftriaxone was 27.18 DDD / 100 days for patients and was the most commonly prescribed antibiotic (48.86%). Based on the Gyssens method, irrational use of antibiotics was found. The highest type of irrationality is in category V (82.53%). Based on DDD method and Gyssens method, there were inappropriate antibiotic usage in the hospital.

**Keywords:** antibiotics, pediatric, DDD, Gyssens



## Lampiran 7.

### **Empirical Antibiotic Therapy Assessment of Patients diagnosed with Sepsis in Intermediate Care Ward of Internal Medicine Department of Dr. Soetomo General Hospital according to Gyssens Method**

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#### ***ABSTRACT***

Rational empirical antimicrobial therapy is an important component of sepsis patient management. This study aimed to assess the rationality of empirical antimicrobial therapy in patients diagnosed with sepsis admitted in intermediate care ward of internal medicine department (RPI) of Dr. Soetomo General Hospital from January 2016 to July 2017. Medical records of 91 patients diagnosed with sepsis were collected and studied retrospectively in period from July 2017 to November 2017. 91 (85.05%) medical records from 107 sepsis patients were evaluated. Cultures and antimicrobial sensitivity tests were carried out in 21 (23.07%) patients. 14 patients yielded positive culture results, 9 of which were MDRO positive with ESBL as resistant marker. Empirical antibiotic therapies for these patients were reviewed according to Gyssens method.

73 (80.2%) of 91 patients were deemed receiving appropriate empirical antibiotic therapies. Ceftriaxone IV injection as monotherapy or combination therapy were the most common empirical antibiotic therapies (82 in 91 patients, 90.1%), despite local microbiologic flora and antibiogram show most pathogens were resistant to ceftriaxone. Mortality rate in this study was high, 92.3% (84 patients died) despite rational empirical antibiotic therapies were high. This study concluded that empirical antibiotic therapies in sepsis patients according to guidelines adopted in Soetomo General Hospital, albeit deemed rational, was no longer

appropriate according to local antibiogram issued by microbiological department of Soetomo General Hospital.

**Keywords:** *Empirical Antibiotics Therapy, Gyssens criteria, Intermediate Care Ward, Sepsis, Septic Shock.*

## Lampiran 8.

### Kajian Penggunaan Antibiotik pada Pasien Sepsis dengan Gangguan Ginjal

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Keyword  
s:antibiotic;  
septic; renal  
disorder; dose  
adjustment;  
antibiotic  
quality.

**ABSTRACT:** Prospective observational study was conducted to investigate antibiotic using, by evaluating clinical pharmacokinetic and antibiotic quality on septic patient with kidney disorder in Interne Department at Hospital X. Septic patients with kidney disorder treated with antibiotic for 4 months. The evaluated antibiotic are excreted by kidney mainly. The clinical aspects of evaluation are kinds of antibiotic, dosage, frequency, period of treatment, and clinical drug interaction. The evaluation of antibiotic quality used

Gyssens method. Total respondents were 40 patients, treated with 8 kinds of antibiotic. Among 8 of them, there were 5 antibiotic which were excreted mainly by kidney. From five antibiotics, it was found that the accurate dosage adjustment on 29 patients (74,3%), and improperly adjustment in 10 patients (10,25%) that adjust upper individual dosage that calculate pharmacokinetically. There were five interactions that clinically significant. The evaluation of antibiotic using qualitatively by Gyssens method found that 4 patients (10%) as incomplete therapy/VI category, two patients (5%) were ineffective category IVa, 1 patient (2,5%) as unsafe category IVb, 9 patients (22,5%) as inappropriate dosage adjustment, and 23 patients (57,5%) as appropriate antibiotic category 0. Conclusion: Using antibiotic that mainly excreted by kidney in septic patients with kidney disorder, generally doesn't show bad impact in kidney of patient.

Kata

kunci: antibiotik;  
sepsis;  
gangguan  
ginjal;  
penyesuaian  
dosis; kualitas  
antibiotik.

**ABSTRAK:** Telah dilakukan kajian observasional secara prospektif terhadap penggunaan antibiotik meliputi aspek farmakokinetika klinik dan kualitas antibiotik secara kualitatif pada pasien sepsis dengan gangguan ginjal di Rawat Inap Penyakit Dalam Rumah Sakit X. Pasien sepsis dengan gangguan ginjal ini diterapi dengan antibiotik selama 4 bulan. Antibiotik yang dievaluasi adalah yang ekskresi utamanya di ginjal meliputi jenis antibiotik, dosis, frekwensi,

lama penggunaan, dan interaksi yang bermakna klinis. Evaluasi antibiotik secara kualitatif menggunakan metode Gyssens. Total pasien berjumlah 40 orang, diterapi dengan 8 jenis antibiotik dan diantaranya ada 5 antibiotik diekskresi utama melalui ginjal. Dari 5 jenis tersebut, ditemukan penyesuaian dosis dengan tepat pada (n=29;74,3%) dan penyesuaian dosis yang tidak tepat (n=10;25,7%) yang melebihi dosis individual yang dihitung secara farmakokinetik. Terdapat 5 jenis interaksi yang bermakna secara klinik. Evaluasi pemakaian antibiotik secara kualitatif dengan metode Gyssens, diperoleh kategori pasien tidak lengkap/VI (N=4; 10%), kategori tidak efektif/IVa (n=2; 5%), kategori tidak aman/IVb (n=1; 2,5%), kategori spektrum tidak sempit/IVd (n=1; 2,5%), kategori dosis tidak tepat/IIa (n=9; 22,5%), dan kategori bijak/tepat/O (n=23; 57,5%). Dari penelitian ini dapat disimpulkan bahwa secara umum penggunaan antibiotik yang diekskresikan sebagian besar melalui ginjal tidak memperlihatkan dampak yang buruk pada fungsi ginjal pasien.

## Lampiran 9.

### Hubungan Kualitas Penggunaan Antibiotik Menggunakan Alur Gyssens dengan Keberhasilan Pengobatan pada Sepsis MDR Gram Negatif di RumahSakit Tersier

*Correlation of the Quality of Antibiotic Usage by Utilising Gyssens Flow and The Success of Treatment in Negative GramMDR Sepsis in Tertiary Hospital*

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### ABSTRACT

**Pendahuluan.** *Multi drug resistance* (MDR) antibiotik sudah menjadi ancaman kesehatan masyarakat yang berdampak global. Penggunaan antibiotik yang tepat menjadikan upaya preventif dan kuratif sangat penting untuk keberhasilan mengatasi MDR dan intervensi terhadap kompleksitas resistensi, minimal memperlambat laju terjadinya MDR. Penelitian ini dilakukan untuk mengetahui perbedaan kualitas penggunaan antibiotik menggunakan alur Gyssens dan keberhasilan pengobatan pasien sepsis akibat bakteri MDR gram negatif dengan infeksi bakteri non-MDR di rumah sakit tersier.

**Metode.** Jenis penelitian ini merupakan kohort retrospektif dengan menggunakan data sekunder pasien berusia  $\geq 18$  tahun yang mendapatkan perawatan di Unit Rawat Inap dan ICU RSPAD Gatot Soebroto tahun 2017 – 2019. Pada kedua kelompok inklusi MDR dan non-MDR gram negatif dilakukan penilaian kualitas penggunaan antibiotik dengan alur gyssen.

**Hasil.** Proporsi kualitas antibiotik yang baik pada bakteri MDR dan non-MDR gram negatif menunjukkan perbedaan yang bermakna (20,6% vs. 13,6%; RR 1,517 (IK 95% 1,1-2,1); p = 0,015) yang menunjukkan MDR gram negatif mengalami 1,517 kali kualitas lebih baik dibandingkan non-MDR. Keberhasilan terapi pada bakteri MDR gram negatif dan non-MDR gram negatif menunjukkan perbedaan yang bermakna (57,4% vs. 39,1%; RR 1,431 (IK 95% 1,0-2,1); p = 0,02).

**Simpulan.** Terdapat kualitas yang lebih baik pada penggunaan antibiotik dengan alur Gyssens pasien akibat infeksi bakteri MDR gram negatif dibandingkan non-MDR di rumah sakit tersier. Selain itu, keberhasilan pengobatan pasien sepsis dengan infeksi bakteri MDR gram negatif juga lebih baik dibandingkan dengan non-MDR.

**Kata Kunci:** Alur Gyssens, keberhasilan terapi, kualitas antibiotik, MDR gram negatif sepsis

### **ABSTRACT**

**Introduction.** *Multi Drug Resistance (MDR) antibiotics have become a global health threat to the community. The use of appropriate antibiotics makes preventive and curative measures very important for the success of overcoming MDR and intervening the complexity of resistance, at least slowing the rate of occurrence of MDR. This study aimed to identify the difference in the quality of antibiotic use quality of use using gyssens flowchart and the success in sepsis patients' treatment due to gram-negative MDR bacteria with non-MDR bacterial infections in tertiary hospitals.*

**Methods.** *A retrospective cohort study was conducted using secondary data from patient with age more or equal than 18 years who were hospitalized in inpatient unit or ICU in Indonesia Army Central Hospital Gatot Soebroto from 2017-2019. Both the MDR and non-MDR gram-negative inclusion groups were assessed for the quality of antibiotic using the Gyssenflowchart.*

**Results.** *There was a significant difference between antibiotic quality on gram negative MDR bacteria and non-MDR (20.6% vs. 13.6%; RR 1.517 (CI 95% 1.1 – 2.1); p value = 0.015) which showed that gram-negative MDR experienced 1.517 times better quality than non-MDR. This study also found that there was a significant difference between therapeutic success on gram negative MDR bacteria and non-MDR (57.4% vs. 39.1%; RR 1,431 (CI 95% 1.0 – 2.1); p value = 0.02).*

**Conclusions.** *There is a better quality on the utilization of antibiotics with Gyssens index patients resulted from MDR negative gram bacterial infection in comparison to non-MDR in tertiary hospital. There is also a better success in treating the sepsis patient with MDR negative gram bacterial infection in comparison with non-MDR.*

**Keywords:** *Antibiotic quality, Gyssens flowchart, MDR gram negative sepsis, therapeutic success*

**Lampiran 10.**

**EVALUASI PENGGUNAAN ANTIBIOTIKA  
PADA PASIENSEPSIS DI RUANG ICU RUMAH  
SAKIT UMUM DAERAH SERANG**

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Kusharwanti, M.Si., Apt., Prof. Dr. Djoko Wahyono, SU., Apt.

**Abstrak**

Sepsis merupakan suatu kondisi medis serius yang dapat menimbulkan kematian. Ketepatan terapi antibiotika pada sepsis dapat menurunkan mortalitas secara bermakna, mencegah terjadinya resistensi dan menurunkan biaya perawatan. Untuk itu penggunaan antibiotika perlu dilakukan secara bijak. Tujuan dari penelitian ini untuk mengetahui gambaran penggunaan antibiotika, mengetahui kualitas penggunaan antibiotika (ketepatan pemilihan obat, kesesuaian durasi, ketepatan dosis dan rute) pada pasien sepsis di RSUD Serang. Penelitian ini merupakan penelitian cross sectional yang dilakukan secara prospektif di ruang ICU Rumah Sakit Umum Daerah Serang. Subyek penelitian adalah semua pasien yang dirawat di ruang ICU Rumah Sakit Umum Daerah Serang, yang mengalami sepsis selama periode September- November 2012. Data yang dianalisa meliputi pola penggunaan antibiotika, kualitas penggunaan antibiotika dengan metode Gyssens dan luaran klinik pasien sepsis. Hasil penelitian menunjukkan dari 33 pasien yang mengalami sepsis didapatkan 29 pasien memenuhi kriteria inklusi.. Antibiotika yang digunakan sebanyak 26 jenis dengan 99 kali frekuensi pemberian. Antibiotika tersebut antara lain seftriakson 18 (18,3%), sefotaksim 16 (16,3%), seftazidim 4 (4%), metronidazole 11 (11,2%), ampicilin 6 (6,1%), ampicilin-sulbaktam 2 (2%), amoksisilin 4 (4%), gentamisin 3 (3%), siprofloksasin 3 (3%), klindamisin 1 (1%), levofloksasin 1 (1%), sefiksim 5 (5,1%), amikasin 2 (2%), sefadroksil 2 (2%), pirazinamid 3 (3%), etambutol 3 (3%), isoniazid 3 (3%), rifampisin 3 (3%), streptomisin 1 (1%), kloramfenikol 1 (1%), meropenem 2 (2%), kotrimoksazol 1 (1%), fosfomisin 1 (1%), sefirom 1 (1%), sefoperason-sulbaktam 1 (1%), sefoperasone 1 (1%). Hasil evaluasi kualitas penggunaan antibiotika menurut metode Gyssens ditemukan kategori O penggunaan antibiotika tepat/bijak 2 (6,9%), kategori IIA penggunaan antibiotika tidak tepat dosis 4 (13,8%), kategori IIIA penggunaan antibiotika terlalu lama 1 (3,4%), kategori IIIB penggunaan antibiotika terlalu singkat 3 (10,4%), kategori IVA yaitu penggunaan antibiotika sesuai tetapi tidak tepat jenisnya karena ada pilihan antibiotika lain yang lebih efektif 19 (65,5%) Parameter luaran klinik 51,7% adalah baik dan 48,3% adalah buruk.

**Abstract**

*antibiotic therapy can decrease the mortality rate, however the use of antibiotic therapy need to use with prudent and systematic approach to prevent resistance and adverse effect. This study aimed to evaluate the pattern of therapy with antibiotics in sepsis patients with gyssens method at RSUD Serang. The study was carried out in Intensive Care Unit at RSUD Serang during September-November 2012. Data were collected with the prospective study in all patient who had sepsis. Among 33 sepsis patient, as many as 29 patient fulfilled inclusion createria and 4 fulfilled exclusion criteria. There were 26*

antibiotics used and 99 episode utilization in study periods these were ceftriaxone 18 (18,3%), cefotaxim 16 (16,3%), ceftazidime 4 (4%), metronidazole 11 (11,2%), ampicillin 6 (6,1%), ampicillin-sulbactam 2 (2%), amoxicillin 4 (4%), gentamycin 3 (3%), ciprofloxacin 3 (3%), clindamycin 1 (1%), levofloxacin 1 (1%), cefixime 5 (5,1%), amikacyn 2 (2%), cefadroksil 2 (2%), pyrazinamide 3 (3%), ethambutol 3 (3%), isoniazid 3 (3%), rifampicin 3 (3%), streptomycin 1 (1%), chloramfenicol 1 (1%), meropenem 2 (2%), kotrimoxazol 1 (1%), fosfomicyn 1 (1%), cefirome 1 (1%), cefoperazone-sulbactam 1 (1%), cefoperazone 1 (1%). Data analysed with Gyssens method were found 0 category the use of antibiotic with prudent 2 (6.9%), category IIA inappropriate antibiotic dose 4 (13,8%) category IIIA Use of antibiotic too long 1 (3,4%). Category IIIB Use of antibiotic too short 3 (10,4%) , category IVA the use of appropriate antibiotics but not the right kind because there is another option that is more effective antibiotics 19 (65,5%). The clinical outcome of research subject were good clinical outcomes 51,7% and bad clinical outcome 48,3%.

**Kata Kunci :** sepsis, antibiotic, infection, Gyssens method.

## Lampiran 11.

### Quality Assesment of Antibiotic Prescription for Sepsis Treatment in Intensive Care Unit at Top Referral Hospital in West Java, Indonesia

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#### Abstract

**Background:** Sepsis is a common disease in intensive care unit (ICU) with high mortality rate. Administration of antibiotic has an important role to determine the outcome of sepsis patient. This study aimed to evaluate the quality of antibiotic prescription for sepsis treatment in intensive care unit (ICU).

**Methods:** This descriptive study was conducted by retrieving data from 48 medical records of patients with sepsis, severe sepsis, and septic shock admitted to ICU Dr. Hasan Sadikin General Hospital (RSHS) in 2013. The study was conducted from August to October 2014. Empiric therapy in the ICU at RSHS and Surviving Sepsis Campaign (SSC) guidelines in 2012 were used as a standard for antibiotic prescription. The quality of antibiotic prescription was assessed then categorized based on Gyssens criteria. The collected data were analyzed in the form of frequency and percentage and presented in tables.

**Results:** This study discovered that most of the patients had severe sepsis and septic shock. Based on Gyssens criteria, 35% antibiotic uses were included into category 0 (proper); 1.4% category I (improper timing); 10.5% category IIA (improper dosage); 9.1% category IIB (improper interval); 3.5% category IIC (improper route); 12.6% category IIIA (improper duration; too long); 1.4% category IIIB (improper duration; too short); 16.8% category IVA (improper; other antibiotics were more effective); 4.2% category IVD (improper; other antibiotics had narrower spectrum); and 5.6% category V (improper; no indication).

**Conclusions:** There are still improper uses of antibiotic for sepsis, severe sepsis, and septic shock patients in the ICU.

**Keywords:** Antibiotic, Gyssens criteria, sepsis, septic shock, severe sepsis

## Lampiran 12.

### Analisis Kualitatif Penggunaan Antibiotik pada Pasien Rujukan dengan Metode Analisis Alur Gyssen di RSPAL Dr. Ramelan Surabaya

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**ABSTRAK :** Penyakit infeksi menjadi penyebab kematian terbesar di Indonesia setelah penyakit kardiovaskular. Tingginya mortalitas akibat penyakit infeksi dapat dipengaruhi oleh ketepatan penggunaan antibiotik. Resistensi antibiotik berhubungan erat dengan ketepatan penggunaan antibiotik. Salah satu faktor yang mempengaruhi resistensi antibiotik pada pasien di rumah sakit adalah perpindahan pasien antar rumah sakit. Penelitian ini dilakukan dengan tujuan untuk mengevaluasi kualitas penggunaan antibiotik yang diberikan kepada pasien khususnya pasien rujukan. Kegiatan ini merupakan salah satu evaluasi yang digunakan sebagai indikator mutu Program Pengendalian Resistensi Antibiotik (PPRA). Penelitian ini bersifat observasional dengan pendekatan pengambilan data secara prospektif yang dilakukan selama 4 bulan (April-Juli 2019) di RSPAL Dr. Ramelan Surabaya. Analisis kualitas penggunaan antibiotik menggunakan penilaian alur Gyssen yang dianalisis oleh 2 orang reviewer dan peneliti. Hasil analisis menunjukkan 44,05% antibiotik yang diberikan tergolong telah rasional (kategori 0); 7,15% antibiotik diberikan tidak tepat (kategori I-IV); 11,90% antibiotik diberikan tidak memiliki indikasi, dan 36,9% antibiotik yang diberikan tidak memiliki kesepakatan antara 2 reviewer dan peneliti dalam penilaian alur Gyssen. Kesepakatan antar 2 reviewer dan peneliti diuji menggunakan Fleiss Kappa dimana diperoleh nilai  $k = 0,581$  yang artinya kesepakatan antar reviewer cukup baik (dengan  $p = 0$ ).

**Kata kunci:** kualitas; antibiotik; Gyssen; pasien rujukan

**ABSTRACT:** Infectious disease is the biggest cause of death after cardiovascular disease in Indonesia. High mortality due to infectious diseases can be influenced by the correct use of antibiotics. Antibiotic resistance is closely related to the correct use of antibiotics. One of the factors influencing antibiotic resistance in patients in the hospital is the transfer of patients between hospitals. This study was conducted to evaluate the quality of antibiotic use given to patients, especially in referral patients. This activity is one of the evaluation activities which is used as an indicator of the quality of PPRA activities. This study was an observational study with



*prospective data collection method, conducted for 4 months (April-July 2019) in Dr. Ramelan Navy Hospital Surabaya. Quality analysis of antibiotics use using the Gyssen flow assessment which was analyzed by 2 reviewers and researchers. The analysis showed that 44.05% of the antibiotics given were classified as rational (category 0); 7.15% of antibiotics given incorrectly (categories I-IV); 11.90% of antibiotics given have no indication, and 36.9% of antibiotics given have no agreement between the 3 reviewers in the Gyssen assessment. The agreement between the two reviewers and researchers was tested using Fleiss Kappa where a value of  $k = 0.581$  was obtained which means the agreement between the reviewers was quite good (with  $p$  value = 0).*

**Keywords:** *quality; antibiotic; Gyssen; referral patient*

### Lampiran 13.

**EVALUASI KUALITATIF PENGGUNAAN ANTIBIOTIK MEROPENEM PADA PASIEN SEPSISBPJS DI RUMKITAL DR. MINTOHARDJO TAHUN 2014**  
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#### ABSTRACT

Sepsis is a systemic and deleterious body response to infection. Sepsis patients require broad-spectrum antibiotic therapy when the pathogenic bacteria that infects the body is unknown. Meropenem is a broad spectrum antibiotic that has a high potential as an empirical and definitive therapy against serious infections caused by multi-drug resistant organism (MDRO). The antibiotic resistance may emerge as a result of inappropriate use of antibiotic. This study aimed to evaluate the quality (appropriateness) use of meropenem in Naval Hospital Dr. Mintohardjo using Gyssens' flowchart. Certain parameters have been analyzed, which are the adequacy of the data, indication, antibiotic choice, duration, dosage, interval, route and timing of antibiotic usage. This is retrospective study using descriptive-case study approach. Data for this study were drawn from patient's medical records from January-December 2014 periode. The data retrieval was done by using the total sampling technique, where 26 samples were obtained in accordance with the study inclusion criteria. Patient characteristics were observed, showed that the most common sepsis type is nosocomial sepsis (42%), disease comorbidity is cerebrovascular sepsis (29%), the mean duration of treatment is 20 days, the number of drug received are 13 and the number of antibiotic received is 3. Meropenem was given as empirical therapy in 24 patients (92,3%) and definitive therapy in 2 patients (7.7%). The result of the qualitative evaluation of meropenem use showed that 15% were appropriate (category 0), and 85% were inappropriate (category I-VI). The inappropriate use of meropenem, 9% due to inappropriate dose, 24 % inappropriate interval, 6% duration too long, 49% because there

were alternatives that more effective, 3% alternatives that have narrower spectrum, and 9% data insufficiency. Referring to this result, the use of antibiotic meropenem in patients with sepsis in RUMKITAL Dr. Mintohardjo requires efforts in improving the quality of use and prevention of meropenem resistance.

Key word: Antibiotic evaluation, Gyssens category, meropenem, sepsis

#### Lampiran 14.

### EVALUASI PENGGUNAAN ANTIBIOTIK SECARA KUALITATIF PADA PASIEN SEPSIS DI INSTALASI RAWAT INAP RSUD DR. SOEDIRAN MANGUN SUMARSO WONOGIRI TAHUN 2016–2018 DENGAN METODE *GYSSENS*

Melinda Yulianasari  
INTISARI

Sepsis merupakan suatu keadaan kompleks tubuh yang disebabkan oleh infeksi yang dapat mempengaruhi hampir semua sistem dan organ tubuh. Angka kematian sepsis masih cukup tinggi baik di negara maju maupun berkembang. Pengobatan utama terapi sepsis adalah penggunaan antibiotik. Tujuan penelitian ini adalah mengetahui pola penggunaan antibiotik pada pasien sepsis dan mengetahui kualitas pemilihan antibiotik dengan metode *Gyssens* pada pasien sepsis di RSUD Dr. Soediran Mangun Sumarso Wonogiri pada tahun 2016-2018. Penelitian ini termasuk penelitian non-eksperimental. Penelitian bersifat retrospektif. Metode yang digunakan untuk mengevaluasi penggunaan antibiotik adalah metode *Gyssens*, standar untuk evaluasi kualitatif dalam penggunaan antibiotik berupa diagram alir yang memuat kategori-kategori untuk menentukan ketepatan penggunaan antibiotik.

Hasil analisis 34 kasus didapatkan bahwa pasien sepsis paling banyak terjadi pada laki-laki sebanyak 58,8%, usia yang paling banyak kategori manula >65 tahun sebanyak 38,2%, lama rawat inap > 7 hari sebanyak 52,9%. Tingkat keparahan sepsis yaitu sepsis sebanyak 52,9%, keadaan sewaktu pulang meninggal >48 jam sebanyak 47,1%. Jenis antibiotik yang paling banyak digunakan untuk pasien sepsis adalah ceftriaxone sebanyak 32,35%. Kualitas penggunaan antibiotik dengan metode *Gyssens* kategori 0 (tepat) sebanyak 73,53%; kategori IIa (tidak tepat dosis) sebanyak 8,82%; kategori IIIa (terlalu lama) sebanyak 2,94%; kategori IVa (lebih efektif) sebanyak 14,71%.

**Kata Kunci :** Antibiotik, ceftriaxone, *Gyssens*, sepsis.

#### ABSTRACT

Sepsis is the body's overwhelming and life threatening response to infection that can lead to tissue damage organ failure and death. The death from sepsis still high not only in the developed countries but also in the developing ones. The mean sepsis therapy is the using of antibiotic. The objectives of this research are to know the design of antibiotic used for sepsis patients and to show the quality of patients at RSUD Dr. Soediran Mangun Sumarso Wonogiri in the year of 2016-2018.

This is a non-eksperimental research. The research is retrospective. It used *Gyssens* method to evaluate the used of antibiotic. The standart for qualitative evaluation is flowchart which contains some categories for the effectiveness of Antibiotic.

The analysis from 34 cases showed that the sepsis patient occurred to the men for about 58,8%; the age from very old person more than 65 years old is 38,2%, hospitalized ones more than 7 days is 52,9%; the serious condition of sepsis is 52,9%; death after hospitalized more than 48 hours is 47,1%; ceftriaxone is the most antibiotic used to sepsis patients, that is

32,35%. The quality of antibiotic used by *Gyssens* method category 0 (fixed) is 73,53%; category IIa (not fixed dosage) is 8,82%; category IIIa (too long applied) is 2,94%; category IVa (more effective is 14,71%).

**Key word :** Antibiotic, ceftriaxone, *Gyssens*, sepsis.

### **Lampiran 15.**

#### **EVALUASI PENGGUNAAN ANTIBIOTIK DENGAN METODE GYSSENS PADA PASIEN INFEKSI SEPSIS NEONATAL DI INSTALASI RAWAT INAP RUMAH SAKIT UMUM DAERAH TUGUREJO SEMARANG PERIODE 2012 – 2016**

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#### **INTISARI**

Sepsis neonatal merupakan sindrom atau gejala klinis penyakit sistemik yang diakibatkan infeksi yang terjadi satu bulan pertama dalam kehidupan. Sepsis neonatal untuk sekarang ini masih terdapat di negara berkembang maupun negara maju. Secara umum terapi penanganan sepsis neonatal menggunakan antibiotik. Tujuan penelitian yaitu untuk mengetahui evaluasi penggunaan antibiotik dengan metode *Gyssens* pada pasien infeksi sepsis neonatal di instalasi rawat inap Rumah Sakit Umum Daerah Tugurejo Semarang Periode 2012-2016.

Jenis penelitian ini adalah non eksperimental (*observasional*) dengan rancangan deskriptif analitik. Metode evaluasi menggunakan metode *Gyssens* untuk mengevaluasi secara kualitatif dari suatu penggunaan antibiotik.

Hasil analisis 40 sampel didapatkan sepsis neonatal lebih tinggi terjadi pada laki-laki (60%), neonatal dini (62,5%), berat badan lahir  $\leq 2500$  gr (50%). Jenis antibiotik yang paling banyak digunakan adalah cefotaxim dan gentamicin masing-masing 34%. 12 penggunaan antibiotik termasuk kategori 0 yang berarti rasional, sedangkan 37 kategori IVa, 11 kategori IIIb dan IIa, 2 kategori IIIa yang berarti penggunaan antibiotik tidak rasional. Tingkat keberhasilan terapi yang membaik (42,5%) dan meninggal (57,5%).

Berdasarkan kesimpulan didapatkan 7 sampel (17,5%) yang rasional dan 33 sampel (82,5%) yang tidak rasional. Terdapat hubungan antara kerasionalan penggunaan antibiotik terhadap keberhasilan terapi atau *outcome clinic* ( $p < 0,05$ ).

Kata kunci : Kerasionalan, antibiotik, sepsis neonatal, *Gyssens*

### **Lampiran 16.**

#### **EVALUASI KUALITAS PENGGUNAAN ANTIBIOTIK**

#### **PADA PASIEN SEPSIS DI BANGSAL PENYAKIT DALAM RSUP DR. M. DJAMIL PADANG DENGAN METODE GYSSENS**

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#### **ABSTRAK**

Sepsis merupakan sindrom respon inflamasi sistemik yang disebabkan oleh infeksi. Secara global insiden sepsis mengalami peningkatan dengan angka kematian yang terus bertambah. Antibiotik yang digunakan secara tepat dinilai dapat menurunkan angka kematian pada sepsis. Tujuan dari penelitian ini adalah untuk mengevaluasi penggunaan antibiotik pada

pasien sepsis di Bangsal Penyakit Dalam RSUP Dr. M. Djamil Padang secara kualitatif. Penelitian ini adalah penelitian deskriptif evaluatif dan pengambilan data dilakukan secara retrospektif. Penelitian dilakukan dengan melihat rekam medik pasien yang mendapat terapi antibiotik yang dirawat di bangsal penyakit dalam selama bulan Maret 2016 sampai dengan bulan Desember 2016. Di antara 70 pasien, 25 orang diantaranya berjenis kelamin laki-laki (35,7%) dan 45 orang lainnya berjenis kelamin perempuan (64,3%). Rentang usia tertinggi terdapat pada usia 45-64 tahun sebanyak (48,57%). Jenis antibiotik yang paling banyak digunakan adalah sefoperazon (26,6%), kemudian levofloksasin (22,6%), meropenem (14,61%), dan siprofloksasin (13,3%). Hasil evaluasi kualitatif menurut kategori Gyssens menunjukkan 60% penggunaan antibiotik tepat (kategori 0). Sebanyak 12,8% dosis tidak tepat (kategori IIA), 1,4% interval tidak tepat (kategori IIB), 5,7% pemberian terlalu lama (kategori IIIA), 4,3% pemberian terlalu singkat (kategori IIIB) dan 15,7% tidak tepat karena ada alternatif lain yang lebih efektif (kategori IVA).

#### **ABSTRACT**

Sepsis is a systemic inflammatory response syndrome caused infection. Globally, the incidence of sepsis increased the number of deaths continues to grow. Antibiotics are used appropriately rated to reduce mortality in sepsis. The aim of this study was to evaluate the use of antibiotics on sepsis patients in the internal medicine ward Dr. M. Djamil Padang hospital were evaluated qualitative. Descriptive evaluative study was used to assess antibiotics use and data collection was done retrospective. The study was conducted by reviewing medication records of patients who received antibiotic therapy during hospitalization in the internal medicine from March 2016 to December 2016. Among the 70 patients, 25 of them were male (35,7%) and 35 others were female (64,3%). Maximum number of patient fell under age range 45-64 years (41,43%). The type of antibiotic most widely used is cefoperazon (26,6%), then levofloxacin (22,6%), meropenem (14,6%), and ciprofoxacin (13,3%). The highest comorbidity was broncopneumonia. Qualitative evaluation results by gyssens category was found 60% antibiotic use was rational (category 0). A total of 12,8% of doses were not appropriate (category IIA), 1,4% of interval were not appropriate (category IIB), 5,7% antibiotic therapy was too long (category IIIA), 4,3% antibiotic therapy was too short (category IIIB), and 15,7% irrational because have alternative more effective (category IVA).

**Lampiran 17.**

**EVALUASI PENGGUNAAN ANTIBIOTIK MENGGUNAKAN METODE GYSSENS  
PADA PASIEN SEPSIS DI *INTENSIVE CARE UNIT* (ICU) RSUD dr. ZAINOEL  
ABIDIN BANDA ACEH**

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**ABSTRAK**

Evaluasi penggunaan antibiotik menggunakan metode Gyssens pada pasien sepsis di *Intensive Care Unit* (ICU) RSUD dr. Zainoel Abidin Banda Aceh telah dilakukan untuk melihat ketepatan penggunaan antibiotik pada pasien sepsis yang menjalani perawatan di *Intensive Care Unit* (ICU) RSUD dr. Zainoel Abidin. Penelitian ini menggunakan metode observasional deskriptif dengan desain *cross-sectional* dan pengambilan data yang dilakukan secara retrospektif dari rekam medis pasien pada periode Januari-Juni 2019. Pedoman evaluasi penggunaan antibiotik yang digunakan pada penelitian ini dikeluarkan oleh *Stanford Health Stanford Antimicrobial Safety and Sustainability Program* untuk *Severe Sepsis and Septic Shock Antibiotic Guide* dan *Clinical and Laboratory Standards Institute* untuk *Performance Standards for Antimicrobial Susceptibility Testing*. Pasien pada penelitian ini berjumlah 32 orang dengan pasien perempuan sebanyak 19 orang dan laki-laki sebanyak 13 orang. Jumlah *regimen* antibiotik yang ditemukan pada penelitian ini 42 *regimen*, 40 *regimen* antibiotik empiris dan 2 *regimen* antibiotik definitif. Antibiotik empiris yang banyak digunakan yaitu meropenem (47,62%), seftriakson (14,29%) dan levofloksasin (14,29%). Hasil dari evaluasi penggunaan antibiotik menggunakan metode Gyssens didapatkan penggunaan yang termasuk ke dalam kategori IVA, IVB, IVC, IVD, IIIA, IIA, IIB, 0 berturut-turut sebanyak 28,33%, 1,67%, 3,33%, 3,33%, 3,33%, 13,33%, 3,33%, 43,33%. Kategori VI, V, IIIB, IIC dan I tidak ditemukan pada penelitian ini. Hasil penelitian ini didapatkan bahwa kategori 0 (ketepatan penggunaan) merupakan kategori paling tinggi dibandingkan kategori lain.

Kata Kunci: Sepsis, antibiotik, metode Gyssens, ICU.

**ABSTRACT**

*Evaluation of antibiotics used using Gyssens method on sepsis patients at Intensive Care Unit (ICU) RSUD dr. Zainoel Abidin Banda Aceh had been conducted to examine the appropriateness of antibiotics used on sepsis patients at Intensive Care Unit (ICU) RSUD dr. Zainoel Abidin. The method of this research is descriptive observational with cross-sectional design and the data retrieval which conducted retrospectively from medical records of inpatients in January-June 2019 period. Guidelines for evaluation the use of antibiotics in this study were issued by Stanford Health Stanford Antimicrobial Safety and Sustainability Program for Severe Sepsis and Septic Shock Antibiotic Guide and Clinical and Laboratory Standards Institute for Performance Standards for Antimicrobial Susceptibility Testing. The patients in this study were 32 patients with 19 women and 13 men. The number of antibiotic regimens found in this study wa 42*

*regimens, 40 empirical antibiotic regimens and 2 definitive antibiotic regimens. The widely used of empirical antibiotics are meropenem (47,62%), ceftriaxone (14,29%) and levofloxacin (14,29%). The result of the evaluation of antibiotics used using Gyssens method obtained uses which is included in the category IVA, IVB, IVC, IVD, IIIA, IIA, IIB, 0 as much as 28,33%, 1,67%, 3,33%, 3,33%, 3,33%, 13,33%, 3,33%, 43,33% respectively. Category VI, V, IIIB, IIC and I were not found in this study. The result of this study found that category 0 (appropriateness of use) is the highest category compared to other categories.*

*Keywords: Sepsis, antibiotics, Gyssens method, ICU.*