MAKALAH ILMIAH

Management of Nosocomial Infections in Clinical Practice in the Intensive Care Unit (ICU) In Soebandi Hospital

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Abstract

Nosocomial infections have high mortality and morbidity, especially in the Intensive Care Unit (ICU). Ventilator-associated pneumonia (VAP), central line-associated bloodstream infection (CLABSI), urinary catheter-related infections, and surgical site infections are the most common types of nosocomial infections that can happen in the ICU. We present a case of a 26-year-old male with severe burn Injury with Grade IIAB –III total 36% BSA + Inhalation Trauma et causa disaster victims. The problems of this patient are extensive wounds, metabolic problems such as hypoalbumin, impaired liver and kidney function, electrolyte and acid-base disturbances, and infection. Definitely, this case needs a multidisciplinary team from plastic surgeon, anesthesiologist, internist, nutritionist, and pharmacist to solve this case to prevent mortality.

Introduction

Nosocomial infection (NI) is defined as an infection occurring in a patient admitted to a healthcare facility for >48 h but without any evidence that the infection was present or incubating at the time of admission (Zhao et al., 2022). It increased the hospitalization costs for patients, reduced the health-related quality of life, had a substantial effect on morbidity and mortality, prolonged the length of stay (LOS), reduced bed turnover rates, and seriously affected the quality of medical care, thus becoming a major global public health concern. Nosocomial infections are common complications in patients hospitalized to intensive care units (ICUs), with reported incidences of 5%–10% in developed European and American countries and about 25% in India. The common nosocomial infections are respiratory tract infections (bronchitis, pneumonia), urinary tract infections (UTI) (cystitis, pyelonephritis), bloodstream infections (BSI) (septicemia), skin and soft tissue infections (SSTIs) including surgical site infections (Vincent et al., 2017).

95% of cases in the Intensive Care Unit (ICU) In Soebandi Hospital are surgical cases, one of which is burn cases. Burn injury refers to harm inflicted on the skin and underlying tissues by heat, electricity, or chemicals that approximately 22% of burn patients seen in the emergency department necessitate admission to the ICU (Datta dkk., 2022). ICU related Healthcare-Associated Infections (HAIs) are more prevalent and result in greater mortality rates compared to other settings (Despotovic dkk., 2020). HAIs or nosocomial

infection is all infections acquired between 48 hours after hospital admission and 3 days of hospital discharge. that the most frequent adverse occurrences experienced by patients during hospitalization (Edwardson dan Cairns, 2019; Despotovic dkk., 2020). There is a direct positive correlation between average length of ICU stay and rates of nosocomial infection. Each invasive procedure performed poses its own risk of infection. Nosocomial infection caused by 2 factors, from patient factors and health care factors. Patient factors such as age >70 years old, malnutrition, alcoholism, heavy smoking, chronic lung disease, diabetes, surgery, trauma, and burns whereas healthcare factors such as nasogastric tube, blood transfusion, central venous catheterization, mechanical ventilation, tracheostomy, and urinary catheterization (Despotovic dkk., 2020).

Methods

This type of research is descriptive research using secondary data collected from the medical record Soebandi Hospital. The data displayed in antibiogram and bacterial mapping. It contains the distribution of bacterial culture results in ICU room June 2023 until March 2024 and the distribution of microorganism Results In ICU Room June 2023 Until August 2023 Dr. Soebandi Hospital based on the culture source such as urine culture, skin swab culture even it found fungal infection in the result of the culture.

Result And Discussion

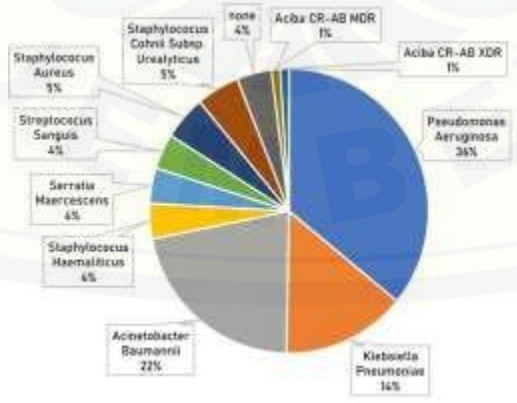
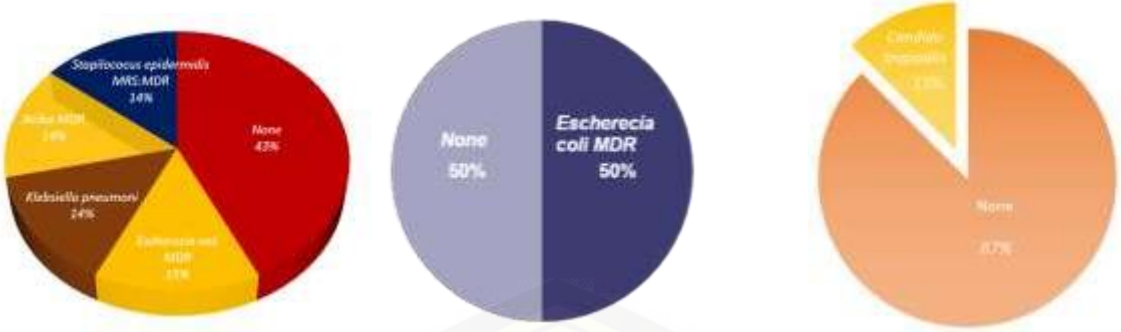


Diagram 1. Distribution of bacterial culture results in ICU room June 2023 until March 2024 dr. Soebandi Hospital



a. skin swab culture b. urine culture c. fungal infection

Diagram 2. Distribution of microorganism Results In ICU Room June 2023 Until August 2023 Dr. Soebandi Hospital

The Diagram 1 shown that the Distribution of bacterial culture results in ICU room June 2023 until March 2024 dr. Soebandi Hospital show that the most bacterial is *pseudomonas aeruginosa* and followed by *acinetobacter baumannii*.

Based on study in Europe, there is a much greater prevalence of nosocomial infections in intensive care units (ICUs)—roughly 20.6%—according to the European Prevalence of Infection in Intensive Care (EPIC). Most of these are ventilator-associated pneumonia (VAP), central line associated bloodstream infection (CLABSI), urinary catheter related infection and surgical site infection (Trubiano, J. A., & Padiglione, A. A. (2015). Critically sick patients typically become colonized with nosocomial germs 48–72 hours after being admitted. The most significant infections are *pseudomonas Aeruginosa* 20%, *Eschericia coli* 16%, *staphylococcus aureus* 20%, and *acinobacter* 9%. The spectrum of nosocomial microorganisms is different from those in the community, with higher rates of resistant organisms. Antimicrobial resistance emerges in ICU because of evolution of resistance in existing bacteria, through selective pressure from antibiotic use, nosocomial transmission especially through contact with healthcare workers or via procedures. Increasing incidence of resistant bacteria in ICUs is associated with poorer outcomes. These include: methicillin-resistant *Staphylococcus aureus (MRSA), vancomycin-resistant Enterococci (VRE) and multi-drug resistant (MDR) Gram negatives* (Trubiano, J. A., & Padiglione, A. A., 2015).

A retrospective study in Fiji's largest ICU (2011-12) reported that 114 of a total 663 adult ICU admissions had bacteriological culture-confirmed nosocomial infection.Gram negative bacteria were the commonest pathogens isolated, especially *Klebsiella pneumoniae* (extended-spectrum *β*-Lactamase-producing), *Acinetobacter,* and *Pseudomonas* species. There was a recent outbreak of *Acinetobacter* in the ICU of CWMH during the study period (August–December 2012). Gram positives were less prevalent with the commonest being coagulase-negative staphylococci and it is difficult to know whether this is a pathogen or skin contaminant. It was most commonly isolated from blood specimens that are often taken through intravenous lines (Naidu K, Nabose.,2014).

Based on the study in Iran, the most common bacteria are commonest pathogen isolated, especially *Pseudomonas aeruginosa*, *Klebsiella* spp., and *E. coli. Morbidity and mortality are significant causes of infections in ICU, and multi resistant Gram-negative bacilli (e.g., Acinetobacter and Pseudomonas species) were reported to be most prevalent germs responsible for infections (*Esfahani, B.N.,2017*).*

The diagram 2. show that the Distribution of microorganism Results In ICU Room June 2023 Until August 2023 Dr. Soebandi Hospital based on the culture source such as urine culture, skin swab culture even it found fungal infection in the result of the culture. If we compare the research in Europe and the Soebandi hospital, mostly microorganisms are not much different. The incidence of systemic fungal infections is much more in immunocompromised individuals such as organ-transplanted patients, patients with hematologic malignancies and HIV-infected patient

The major fungi implicated worldwide are Candida and Aspergillus spp., followed by Cryptococcus, Histoplasma., in endemic areas. These produce a wide variety of infections that are difficult to diagnose as most of the diagnosing tests are non-specific and the culture takes a long time. In the United States, the frequency of nosocomial fungal infections has risen from 2 to 3.8 per 1000 hospital discharges. Candida spp. stands out as the predominant strain, representing 8-15% of nosocomial bloodstream infections and the fourth most prevalent isolate among intensive care unit patients. Detecting fungal infections in critically ill patients poses a considerable challenge due to the overshadowing symptoms of primary underlying conditions. The origin of fungal infections can be broadly categorized into systemic infections stemming from genuine pathogenic fungi and infections resulting from opportunistic saprophytic fungi (Bajwa S and Kulshrestha, 2015).

Health-care-associated (or nosocomial) infection is a major problem in hospitals worldwide and the prevalence is two- to threefold higher in developing countries compared to Europe or USA. The incidence is particularly high in intensive care units (ICUs) compared to non-ICU wards in the hospital as ICU patients have a range of severe comorbidities and the use of invasive devices during their management is very common.

In the EPIC II study, the most frequently reported sites for ICU acquired infections were the lungs (64%), abdominal (19%), and blood stream (15%). Data from the United States National Nosocomial infections surveillance system showed that the nosocomial pneumonia accounted for 31% of all nosocomial infections followed by urinary tract infections and bloodstream infections.

Based on retrospective study in Fiji's largest ICU (2011-12) reported that 114 of a total 663 adult ICU. There were 437 isolates from 114 patients and so most patients had isolates cultured from multiple sites. Of patients, 66% had isolates from a respiratory specimen (endotracheal tube or pleural fluid), 49% from a urinary specimen (indwelling catheter or clean catch), 67% from a blood specimen (peripheral or central line), and 41% from a surgical site (wound swab or surgical drain). Gram negative bacteria such as *Klebsiella pneumoniae*, *Acinetobacter* species, and *Pseudomonas aeruginosa* were the commonest isolates. *K. pneumoniae* (extended-spectrum *β*-Lactamase (ESBL) producing) was isolated from blood and urine in 21% of patients simultaneously. Coagulase-negative staphylococci were most commonly isolated from blood. *Pseudomonas aeruginosa* was the commonest isolate from surgical site specimens (Naidu K.,2014)

Based on study in Eastern India, Data were collected from 242 patients accounting for a total of 1736 patient days. Intensive care unit acquired nosocomial infections were detected in 29 patients. These 29 patients developed one type of nosocomial infection each. The most frequently diagnosed nosocomial infection was nosocomial pneumonia. Combining both ventilator associated pneumonia (VAP) and non-VAP, nosocomial pneumonia was found in 18 (62.07%) of the 29 infected patients. Taken separately, VAP was diagnosed in 10 (34.48%) and non ventilator associated with nosocomial pneumonia was diagnosed in 8 (27.59%) of the infected patients. Urinary tract infection was diagnosed in 8 (27.59%) out of the 29 infections and central venous catheter related bloodstream infection was detected in 3 (10.34%) patients. The distribution of pathogens responsible for the nosocomial infection cases in this study,

categorized by site of infection. A total of 40 pathogens were isolated on culture and accounted for the nosocomial infections in 29 patients. Some infections were polymicrobial. Gram-negative Enterobacteriaceae were the most frequently isolated pathogens (n = 15; 37.5%) closely followed by *Pseudomonas* species (n = 14; 35%, *Pseudomonas aeruginosa* = 13, *Burkholderia cepacia* = 1)

The precise pattern of causative organisms, whether bacterial or fungal, varies across countries and between ICUs according to patient case mix, site of infection,antibiotic protocols, infection control practice and local ecology and resistance patterns. Although recent years have seen swings in the pathogen pattern toward Gram-positive bacterial infections, still, most studies report that more than half of the nosocomial infections occurring in the ICU are due to Gram-negative bacteria. In our study too, the most commonly isolated organisms were Gram-negative Enterobacteriaceae followed closely by Pseudomonas species. The detection of Candida species in 15% of the isolates in the present study is also consistent to some extent with the studies of Edgeworth et al., who have reported that fungal pathogens are also becoming increasingly common among patients with nosocomial bloodstream infections

Treatment and Prevention In ICU Soebandi Hospital

Treatment and prevention in ICU Soebandi Hospital use VAP bundles and Central line insertion and care bundle.

Ventilator-associated pneumonia (VAP) is a type of hospital-acquired pneumonia (HAP) that manifests at least 48 hours after the patient has undergone endotracheal intubation.treatment and prevention VAP such as Placing the patient in a semi-recumbent position has been shown to decrease the incidence of ventilator-associated pneumonia (VAP) compared to positioning the patient supine. This is particularly significant for patients receiving enteral nutrition. Additionally, using endotracheal tubes that allow aspiration of subglottic secretions can reduce the occurrence of VAP. Silver-coated tubes have also been found to prevent the transmission of oropharyngeal flora to the distal lung, resulting in a 48% relative risk reduction of VAP; however, they have not yet shown any difference in patient-centered outcomes.

Central line associated infections are one of Hospital acquired infections especially in Soebandi Hospital. A study showed that infection from central line insertion estimated around 3% and has a 19% case fatality rate. if the patient suspect have Central line associated bloodstream infection, the catheter must be remove, take sample for culture, and initiate broad

spectrum antibiotic or empirical antibiotic until the result of culture and bacterial sensitivity complete. prevention of CLABSI is more important. ins Soebandi hospital prevention of CLABSI using 'CLABSI bundle' which is a combination of "best practice" to prevent CLABSI. the protocol of CLABSI bundle are hand hygiene (surgical hand washing), use a maximal barrier precaution, avoid insertion of catheter in femoral, disinfection of skin using 2% chlorhexidine solution in 70% isopropyl alcohol, and Use a sterile, transparent, semi-permeable dressing to cover the catheter site (Trubiano, J. A., & Padiglione, A. A., 2015).

In the intensive care unit (ICU), principles of antimicrobial stewardship are crucial, including local awareness of antimicrobial trends, early targeted therapy for sepsis (including antifungals for high-risk patients), early source control (such as changing central venous catheters), appropriate de-escalation of broad-spectrum therapies, utilizing shorter durations of antibiotics, and ensuring appropriate dosing of antimicrobials (Edwardson & Cairns, 2019).

Limitation

Appropriate management, diagnosis, and prevention for nosocomial infection can reduce the mortality and morbidity and then can increase patient outcome. However, limitations in the management and prevention of nosocomial infections are also associated with increasing morbidity, mortality, and length of stay of patients. (Edwardson & Cairns, 2019; Trubiano & Padiglione, 2015)

First is the education factor of health workers and family when caring for patients and maintaining other factors such as a good environment for the patient in Soebandi Hospital. Hand hygiene of health workers and family in caring for patients prevents the transmission and colonization of bacteria. However, limited knowledge and awareness about hand hygiene in caring for patients is still low among health workers and patients' families. About 40 percent of all hospital-acquired infections are thought to be related to poor hand hygiene. Therefore, it is important to educate health workers regarding infection control policies and implementation. (Edwardson & Cairns, 2019; Trubiano & Padiglione, 2015)

Timely and accurate diagnosis of nosocomial infection both are key to have optimal management, increase patient outcome, and generally decrease factors which lead to antimicrobial infection. sampling technique, lack of amount reagent, and not performing EGDT in early patients with sepsis condition are limitations to perform diagnosis in Soebandi hospital whereas correct timing, sampling technique, and sufficient volume blood sample are vital for the test. limitations on these factors will influence the results. Currently, only around one-third

of patients worldwide displaying signs of sepsis show positive blood cultures. (Edwardson & Cairns, 2019; Trubiano & Padiglione, 2015)

Less maintenance of machines and tools are also a limitation in Soebandi hospital whereas medical equipment is one of the factors that causes nosocomial infection. medical equipment and invasive procedures which can cause 'port de entry' of nosocomial infection. (Edwardson & Cairns, 2019; Trubiano & Padiglione, 2015). Multidisciplinary approach regarding the problem of antimicrobial therapy is also important. therefore Lack of education about bundle infections is a limitation in Soebandi hospital. A good antimicrobial management can reduce excessive adverse effects of antimicrobial drugs, broad spectrum antimicrobial usage, and antimicrobial resistance of bacteria. Therefore health workers must know about preventing and managing nosocomial infection. (Edwardson & Cairns, 2019; Trubiano & Padiglione, 2015).

Conclusion

Nosocomial infection (NI) is defined as an infection occurring in a patient admitted to a healthcare facility for >48 h but without any evidence that the infection was present or incubating at the time of admission. The common nosocomial infections are respiratory tract infections (bronchitis, pneumonia), urinary tract infections (UTI) (cystitis, pyelonephritis), bloodstream infections (BSI) (septicemia), skin and soft tissue infections (SSTIs) including surgical site infections.95% of cases in the Intensive Care Unit (ICU) In Soebandi Hospital are surgical cases, one of which is burn cases. Burn injury refers to harm inflicted on the skin and underlying tissues by heat, electricity, or chemicals that approximately 22% of burn patients seen in the emergency department necessitate admission to the ICU. the Distribution of bacterial culture results in ICU room June 2023 until March 2024 dr. Soebandi Hospital show that the most bacterial is *pseudomonas aeruginosa* and followed by *acinetobacter baumannii*. Microorganism Results In ICU Room June 2023 Until August 2023 Dr. Soebandi Hospital based on the culture source such as urine culture, skin swab culture even it found fungal infection in the result of the culture. Treatment and prevention in ICU Soebandi Hospital use VAP bundles and Central line insertion and care bundle. Less maintenance of machines and tools are also a limitation in Soebandi hospital whereas medical equipment is one of the factors that causes nosocomial infection. medical equipment and invasive procedures which can cause 'port de entry' of nosocomial infection.

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Management of Nosocomial Infections in Clinical Practice in the Intensive Care Unit (ICU) In Soebandi Hospital

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2024

Surgery cases in ICU-→ BURN

Infection is a leading cause of morbidity and mortality and remains one of the most challenging concerns for the burn team

Risk Factor

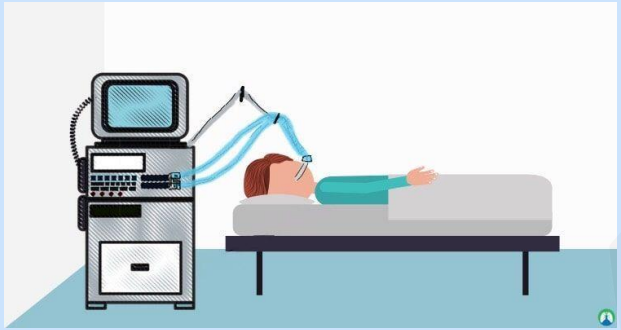
Factors leading to increased risk of nosocomial infection

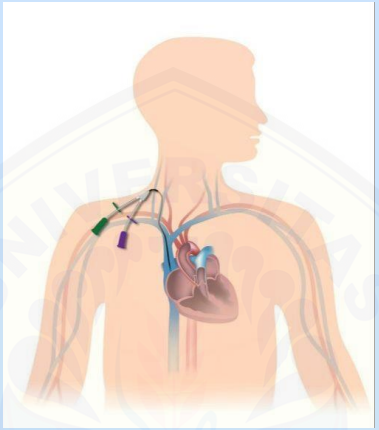
Patient factors		Healthcare factors	
Chronic	Acute	Invasive procedures	Treatment
Advanced age (>70)	Surgery	Endotracheal or nasal intubation	Blood transfusion
Malnutrition	Trauma	Central venous catheter insertion	Recent antimicrobial therapy
Alcoholism	Burns	Extracorporeal renal support	Immunosuppressive treatments
Heavy smoking		Surgical drains	Stress-ulcer prophylaxis
Chronic lung disease		Nasogastric tube	Recumbent position
Diabetes		Tracheostomy	Parenteral nutrition
		Urinary catheter	Length of ICU stay

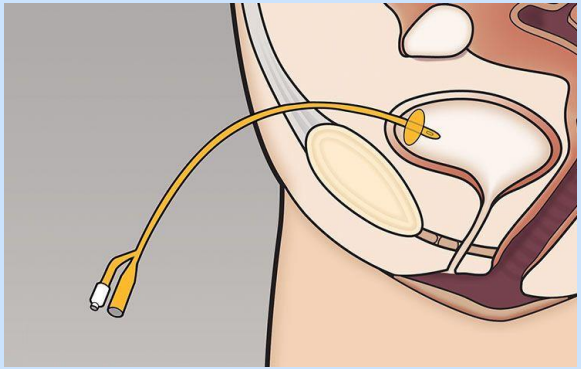
The most significant risk factors for nosocomial infections refer to **invasive procedures** that occur during hospitalization, such as the use of urinary catheters and CVCs.

Aleksa Despotovic MDA, et al.2020. Hospital-acquired infections in the adult intensive care unit—Epidemiology, antimicrobial resistance patterns, and risk factors for acquisition and mortality

Nosocomial Infection







Ventilator-associated Pneumonia (VAP)

Central Line-associated Blood Stream Infection (CLABSI)

Urinary Catheter-related Infections

MORTALITY

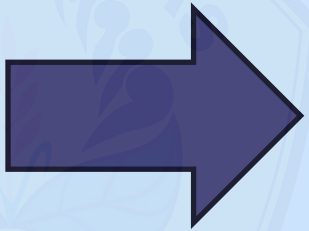
Disaster Victims

Male/26Th/ /Severe Burn Injury with Grade IIAB –III total 36% BSA + Inhalation Trauma

- Treated in ICU

Problems :

- **Extensive wound**
- **Metabolic problem: hypoalbumin, impaired liver and kidney function, electrolyte and acid-base disturbances**
- **Infection**



Multidiciplinary Team:
Plastic surgeon
Anestesiologist
Internis
Nutritionist
Pharmacist

The goal directed therapy of patient management

Control Infection

- Wound care program :
1. Debridement + Skin Graft on second day about 2-3%
2. Wound care every 3 days with antibiotic topical
- do culture : skin , blood stream

Intensify the Nutritional Status

Albumin

High protein foods

Accelerate Wound Healing

Empiric antibiotic on the 1st day until the fifth day

Doing skin swab culture while doing the wound care

Day 1-3

Ampicillin Sulbactam

Day 4-7

On the 4th day sputum culture — **Meropenem and levofloxacin**

Day 7

Sputum Culture : *Pseudomonas Aeruginosa* | **Blood Culture : None bacterial infection** | **Meropenem and levofloxacin stop change to tetrasiklin**

Blood Culture + Skin Swab Culture — **Day 13**

MRSA — **Sensitive Vancomycin**

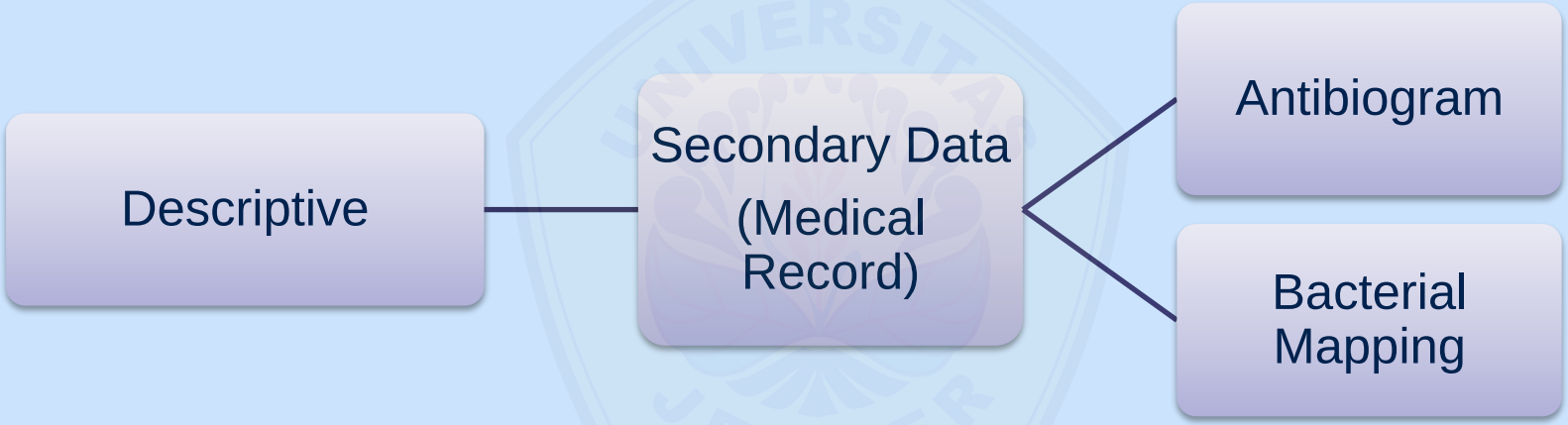
Day 14

Patient was died → Multi Organ Failure

Syock Septic

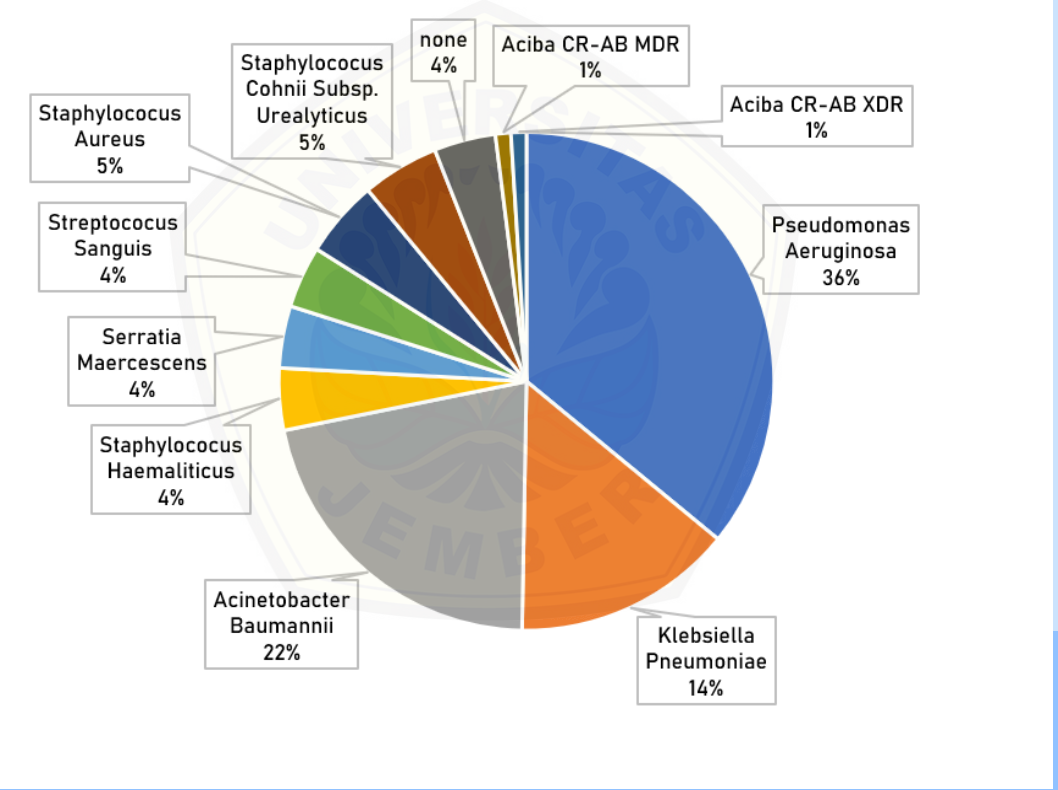
- **Description of the miroorganisms that cause infection in ICU Soebandi Hospital**

Method

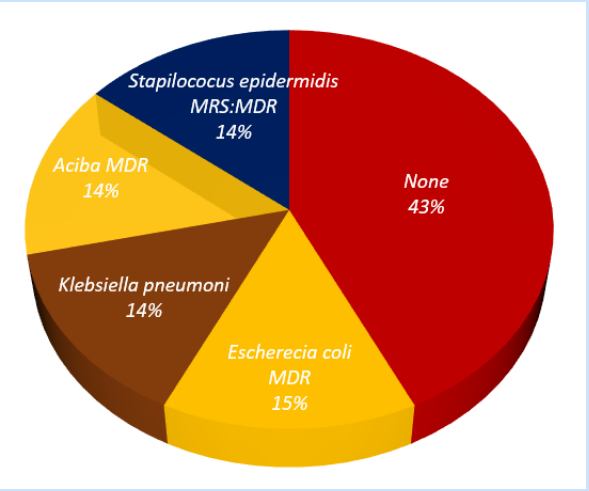


Result

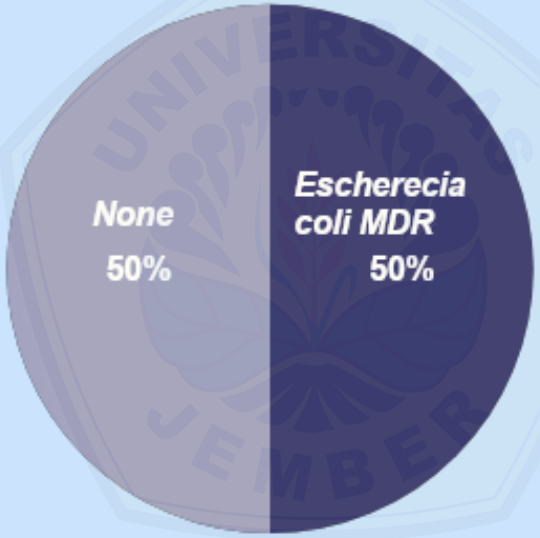
Distribution of bacterial culture results in ICU room June 2023 until March 2024 dr. Soebandi Hospital



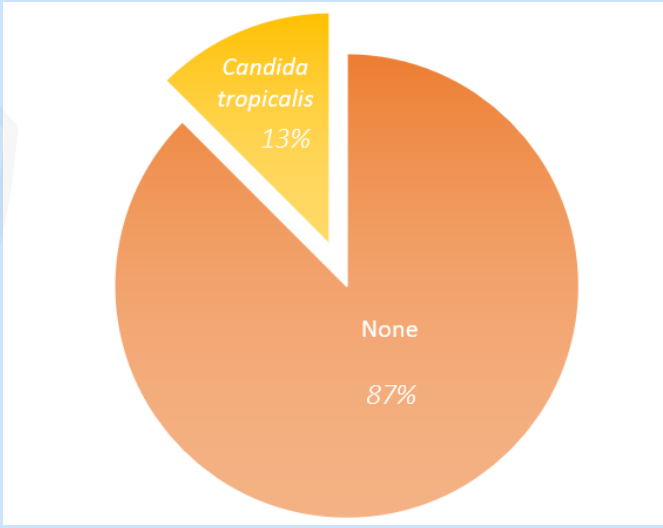
Distribution of **microorganism** Results In ICU Room June 2023 Until August 2023 Dr. Soebandi Hospital



Bacterial based on Skin Swab Culture



Urine Culture



Fungal Infection

Discussion

Percentages of the most frequently isolated micro-organisms in nosocomial infections in the ICU (ECDC study)

Micro-organism	Ventilator-associated pneumonia (%)	Bloodstream infection (%)	Urinary tract infection (%)
Pseudomonas aeruginosa	27.5	4.6	10.6
Staphylococcus aureus	12.5	18.5	1.6
Klebsiella spp.	10	10.8	6.1
Escherichia coli	15	9.2	18.2
Enterobacter spp.	15	6.2	5.7
Candida spp.	2.5	12.3	15.3
Serratia spp.	5	0	
Stenotrophomonas multophilia	12.5	0	
Haemophilus spp.	0	0	
Enterococcus spp.	0	13.8	13.8
Coagulase-negative staphylococci	0	20	3.1
Acinebacter spp.	0	4.6	

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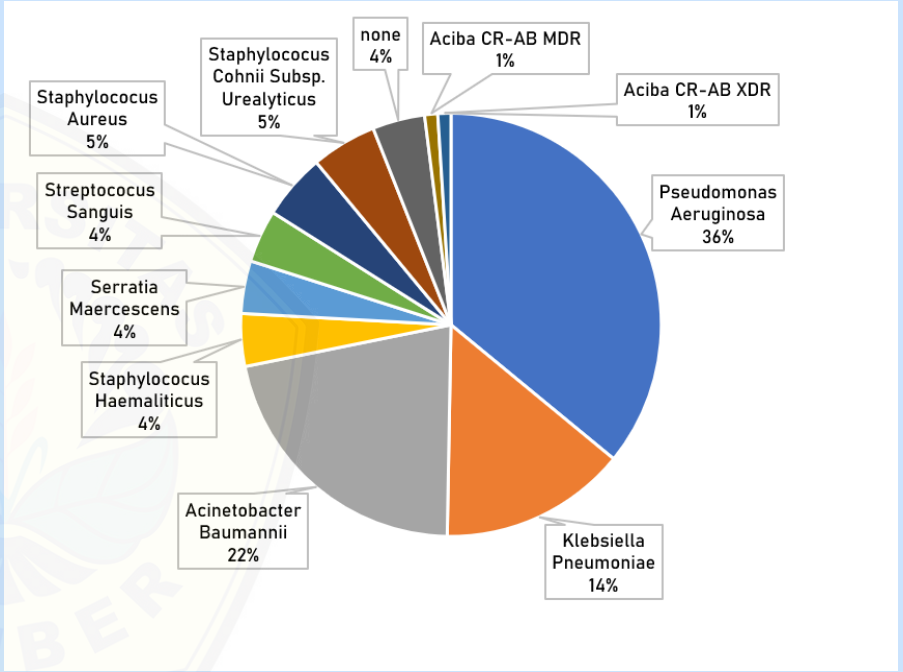
2. NNIS System. National Nosocomial Infections Surveillance System January 1989–June 1998. A report from the NNIS System. Am J Infect Control 1999 Dec; 27(6): 520-32.

(UTI Data from National Nosocomial Infections Surveillance System January 1989–June 1998.)



The most microorganism in Soebandi Hospital = The research in Europe's Hospital

Fungal Infection

The incidence of systemic fungal infections is much more in immunocompromised

- organ-transplanted patients
- hematologic malignancies
- HIV-infected patients

The major fungi implicated worldwide are *Candida and Aspergillus spp.*, followed by *Cryptococcus, Histoplasma* in endemic areas (Bajwa S and Kulshrestha, 2015).

Treatment and Prevention in ICU Soebandi Hospital

VAP Bundles

- Elevating the head of the bed 30–45 degrees
- Daily sedation holds
- Weaning plan
- Chlorhexidine oral care
- Stress ulcer prophylaxis
- Venous thromboembolism prophylaxis

Central Line Insertion And Care Bundle

- Trained operator
- Written record of procedure
- Surgical scrub
- Maximal sterile barrier precautions (hat, gown, gloves, mask)
- Aim to avoid femoral insertion site if possible
- Skin asepsis with 2% chlorhexidine in 70% isopropyl alcohol. Allow this to dry prior to skin puncture
- Use a sterile, transparent, semi-permeable dressing to cover the catheter site

Infection Prevention :

- Hand Hygiene
- Environment Hygiene

Infection Diagnose :

- Sampling Technique
- Limit of Clinical microbiologist and the reagent
- ⬇ EGDT in sepsis

Limitation

Infection Treatment :

- Low education infection bundle
- Low maintenance and machine rotation

Recurrent Infection :

- Patient back to ICU <72 hours and more seriuous infection MDR

Conclusion

PREVENTION IS **MORE EFFECTIVE** THAN TREATMENT

THANK YOU

References

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16 SKP IDI*

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VIETNAMESE - GERMAN CENTER FOR MEDICAL RESEARCH

Expert Seminars & Workshop

EMERGING & RE-EMERGING Infectious Diseases

HANDS-ON TRAINING ON BASIC PRINCIPLES OF BIOSAFETY

Module 1: 23 - 26 April 2024
Module 2: 29-30 April 2024
08 AM - 04 PM GMT+7

Faculty of Medicine
Universitas Jember
East Java, Indonesia

The registration fee for up to 40 selected participants for each Module will be covered by DAAD-PACE-UP

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Universitätsklinikum Tübingen, Germany and Vietnamese German Center for Medical Research, Hanoi

PROF. DR. JONAS SCHMIDT-CHANASIT
Bernhard Nocht Institute for Tropical Medicine, Germany

PROF. DR. CLAUS THOMAS BOCK
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PROF. DR. NGUYEN LINH TOAN
Vietnam Military Medical University, Hanoi, Vietnam

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DR. ULFA ELFIAH, M.KES., SP.BP-RE, SUBSP.L.B.L(K)
Universitas Jember, Indonesia

PROGRAMME DETAILS:

REGISTRATION:

Registration Deadline: 16 April 2024

REGISTRATION FEE

Module 1:
IDR 800K / 55 USD
Module 2:
IDR 300K / 20 USD
Bundling:
IDR 1000K / 65 USD

PAYMENT

BANK NEGARA INDONESIA (BNI)
VA Number: 988 115 156 775 6313
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SWIFT Code: BNINIDJA030

Free online participation is only available upon registration for overseas personal

Registration: https://unej.id/regWSapril24
Agenda : https://unej.id/ParticipantInfo

www.paceup.org

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*) Professional credit units from The Indonesian Medical Association (Module 1=8; Module 2=8 SKP IDI)

Expert Seminars on Emerging and Re-emerging Infectious Diseases
Hands-on Training on Basic Principles of Biosafety
Tuesday, 23rd of April 2024

No	Time (WIB/GMT+7)	Agenda	Venue
1	07.30-08.30	Participant registration	Auditorium Medical Faculty UNEJ
2	08.30-08.40	Opening: 1. Indonesian national anthem: Indonesia Raya 2. Hymne Universitas Jember	
3	08.40-09.10	1. Report from PACE UP Director Prof. Dr. Thiru. Velavan 2. Remarks by the Director of DAAD Jakarta Dr. Guido Schnieders 3. Remarks by the German Ambassador for Indonesia Frau. Ina Lepel 4. Welcome remarks and opening by the Rector UNEJ Dr. Ir. Iwan Taruna, M.Eng, IPM.	
4	09.10-09.15	Group photo	
5	09.15-09.40	1. Angklung play with all the resource personals, guests, and participants led by Maria Fatima Junior High School Jember team 2. Angklung performance by Maria Fatima Junior High School Jember	
6	09.40-09.50	Break	
7	09.50-10.30	Arboviruses (Prof. Dr. Jonas Schmidt- Chanasit)	
6	10.30-10.45	Coffee break	
8	10.45-11.30	MERS-CoV (Prof. Dr. Thiru. Velavan)	
9	11.30-12.15	Dengue and Vaccines (Prof. Dr. Jonas Schmidt- Chanasit)	
10	12.15-13.30	Lunch	
11	13.30-14.15	Zika (Prof. Dr. Jonas Schmidt-Chanasit)	
12	14.15-15.00	Dengue in Vietnam (Prof. Dr. Nguyen LinhToan)	
13	15.00-15.30	Coffee break	
14	15.30-16.15	Vector control (Dr. Wolfgang Hoffmann)	
15	16.15-16.45	Malaria and flavivirus vectors in Indonesia (Prof. Dr. rer. nat. KartikaSenjarini)	
16	16.45-17.30	Break (transport to UNEJ main office)	UNEJ's main office
17	17.30-21.00	Welcome Dinner: 1. Welcome remarks from the Rector of UNEJ 2. Token of Appreciation	

Expert Seminars on Emerging and Re-emerging Infectious Diseases
Hands-on Training on Basic Principles of Biosafety
Wednesday, 24th of April 2024

Venue: Auditorium Medical Faculty UNEJ

No	Time (WIB/GMT+7)	Agenda
1	08.00-08.45	Yellow fever/ Crimean- Congo / West Nile Virus (Prof. Dr. Jonas Schmidt-Chanasit)
2	08.45-09.30	Hepatitis B and Delta (Prof. Dr. ClausThomas Bock)
3	09.30-10.00	Coffee break
4	10.00-10.45	Hepatitis E (Prof. Dr. Claus ThomasBock)
5	10.45-11.15	Mosquito Identificationusing Deep Learning (Dr. Tran Duc Khanh)
6	11.15-12.15	Lunch
7	12.15-13.00	Differential diagnosis (Prof. Dr. med. Dennis Nurjadi and Prof. Dr. Thiru. Velavan/ Prof. Dr. Claus Thomas Bock)
8	13.00-13.45	Differential diagnosis Indonesia & Vietnam (Dr. Angga Mardro Raharjo and Dr. Nguyen Trong The)
9	13.45-14.15	Coffee break
10	14.15-15.00	Small working groups: Differential diagnosis &case presentation (Dr. Ulfa Elfiah, Dr. NguyenTrong The, Prof. Dr. med. Dennis Nurjadi)
11	15.00-19.00	Social program to the Indonesian Coffee and Cocoa Research Institute

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CERTIFICATE

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This Certifies that

dr. Ulfa Elfiah, M.Kes., Sp.BP-RE(K)

has participated as speaker at

EXPERT SEMINARS ON

EMERGING AND RE-EMERGING INFECTIOUS DISEASES

23RD – 26TH APRIL 2024, JEMBER, INDONESIA

SK-SKP-202/PKB/IDI-IWJ/2024

8 SKP-IDI (SATUAN KREDIT PROFESI- IKATAN DOKTER INDONESIA)

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