

**NOSOCOMIAL INFECTION IN INTENSIVE CARE UNIT:  
A RETROSPECTIVE ANALYSIS**

**BY**

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## LIST OF ABBREVIATIONS

BSI	Blood stream infections
CDC	Centre for Disease Control and Prevention
COAD	Chronic obstructive airway disease
CVA	Cerebrovascular accident
DM	Diabetes mellitus
EPIC	European Prevalence of Infection Study
ESBL	Extended-spectrum beta lactamase
ICU	Intensive care unit
IHD	Ischemic heart disease
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
SAPS II	Simplified Acute Physiology Score II
SD	Standard deviation
SSI	Surgical site infection
UTI	Urinary tract infection

# **ABSTRAK**

**Tajuk:** Jangkitan Nosokomial di Unit Rawatan Rapi: Satu Kajian Retrospektif.

**Latarbelakang:** Kadar jangkitan penyakit nosokomial di unit rawatan rapi adalah 5 hingga 10 kali lebih tinggi daripada di wad am. Pengetahuan dalam penggunaan antibiotik adalah penting dalam mencapai keputusan klinikal yang optimum dan pengawalan kemunculan organisma yang lebih resisten di samping pengurangan kos. Tujuan kajian retrospektif ini adalah untuk menentukan status semasa kadar jangkitan di Unit Rawatan Rapi, Hospital Universiti Sains Malaysia (HUSM).

**Kaedah:** Kajian semula kadar jangkitan nosokomial di HUSM selama satu tahun dari April 2008 hingga Mac 2009 telah dijalankan. Takrifan jangkitan nosokomial adalah berdasarkan daripada takrifan CDC. Kadar keseluruhan nosokomial pesakit, kadar kepadatan insiden untuk jangkitan nosokomial, demografi pesakit, jangkamasa di unit rawatan rapi, tempoh penggunaan peralatan invasif, jenis jangkitan nosokomial, skor SAPS II, serta keputusan mortaliti dan morbiditi ditentukan. Kadar sensitiviti organisma dan antibiotik dikaji.

**Keputusan:** Seramai 795 pesakit dimasukkan ke unit rawatan rapi, 60 pesakit telah mendapat jangkitan nosokomial. Kadar jangkitan nosokomial adalah sebanyak 7.5 bagi 100 pesakit dengan kepadatan insiden adalah 91 bagi 1000 hari. Min untuk jangkamasa di unit rawatan rapi adalah  $17.13 \pm 10.11$  hari. Pesakit yang mengalami diabetes dan darah tinggi menunjukkan keputusan yang hampir sama dengan pesakit tanpa penyakit (33.3%; 36.7% kepada 31.7%). Min skor SAPS II adalah  $41.82 \pm 16.50$ . Peratusan pesakit yang hidup adalah 56.7% manakala 6.7% dimasukkan semula ke unit rawatan rapi. Jenis jangkitan nosokomial yang tertinggi adalah bakteremia dan pneumonia (38.3%) dengan organism gram negatif sebagai organisma utama (59.6%). Organisma dari cecair trakea adalah *Acinetobacter* sp. (24.5%). Rawatan antibiotik permulaan adalah meropenem (29.8%). Empat organisma yang resistan adalah *Acinetobacter* sp. (26.8%), *Klebsiella* sp. (14.3%), MRSA (14.3%) dan *E.coli* (7.1%). Terdapat 5 kes menunjukkan resistan kepada pelbagai antibiotik (multidrug-resistant) bagi *Acinetobacter* sp. telah diperolehi (35.7%). Manakala 3 kes menunjukkan kehadiran organisma ESBL (extended-spectrum beta lactamase) *Klebsiella* sp. dan *E.coli* (21.4%).

**Kesimpulan:** Organisma gram negatif adalah organisma utama dalam jangkitan nosokomial di unit rawatan rapi. Organisma utama yang berpotensi dalam resistan kepada pelbagai antibiotik adalah *Acinetobacter* sp. Satu kajian prospektif tempatan pada masa hadapan akan dapat membantu dalam pemantauan kadar jangkitan nosokomial di unit rawatan rapi.

# ABSTRACT

**Title:** Nosocomial Infection In Intensive Care Unit: A Retrospective Analysis

**Background:** Intensive-care-unit (ICU)-acquired infection rates are 5–10 times higher than hospital acquired infection rates in general ward patients. Knowledge in the use of antibiotics in ICU is important to ensure an optimal clinical outcome, and also control the emergence of resistance among pathogenic microorganisms as well as to reduce cost. The aim of this retrospective study was to determine the current status of ICU infection in Hospital Universiti Sains Malaysia. (HUSM)

**Methodology:** A retrospective review of nosocomial infection in HUSM over one year period from April 2008 to March 2009 was performed. Nosocomial infections (NIs) were defined according to the Centers for Disease and Prevention. The overall patient NIs rate, the incidence density rate of NIs, patients' demography, length of ICU stays, days on devices, type of nosocomial infection, the Simplified Acute Physiology Score (SAPS) II score and outcome were determined. The organisms and antimicrobial susceptibility profiles were further investigated.



**Results:** From 795 patients admitted to ICU, 60 patients were identified with nosocomial infections. The overall NIs rate was 7.5 per 100 patients, with incidence density rate 91 per 1000 days .The mean length of stays was  $17.13 \pm 10.11$  days. Patients with diabetes mellitus and hypertension were almost similar to patients with no co-morbidities (33.3%; 36.7% versus 31.7%). The mean SAPS II score was  $41.82 \pm 16.5$ . Outcome of patients who survived was 56.7%, whereas 6.7% was readmitted to ICU. The main type of NIs were bacteremia and pneumonia (38.3%) with gram negative bacteria as the main organism isolated (59.6%). The main organism isolated was *Acinetobacter* sp. (24.5%) from tracheal aspirate. The initial therapy was monotherapy mainly by meropenem (29.8%) and the least used was cephalosporins. Four main organisms developed resistant were *Acinetobacter* sp. (28.6%), *Klebsiella* sp. (14.3%), MRSA (14.3%) and *E.coli* (7.1%). There were no specific resistant to any group of antibiotics. Five cases of multidrug-resistant *Acinetobacter* sp. were isolated (35.7%), whereby three cases of extended-spectrum beta lactamases (ESBLs) *Klebsiella* sp. and *E.coli* were isolated (21.4%).

**Conclusion:** Gram negative organism remain the main pathogen in ICU infection with the main pathogen was *Acinetobacter* sp. that potentially could lead to the emergence of multidrug-resistant. A future local prospective study would facilitate the surveillance of ICU infection.