

# Randomized Controlled Study of Antibiotic Preauthorization on Patients' Clinical Outcomes, Antibiotic Consumption and Antibiotic Expenditures

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## ABSTRACT

### Background

Piperacillin/tazobactam, imipenem and meropenem were inappropriately used in 50 percent of hospitalized patients at Siriraj Hospital. Antibiotic preauthorization is a recommended strategy for controlling inappropriate antibiotic use. A concern of this strategy is that it could have harmful clinical outcomes of the patients whom their antibiotics are changed or discontinued.

### Objective

To determine an effectiveness of antibiotic preauthorization on patients' clinical outcomes, antibiotic consumption and antibiotic expenditures.

### Methods

Hospitalized patients who received target antibiotics namely piperacillin/tazobactam, imipenem or meropenem from August to November 2007 were randomized to the antibiotic preauthorization group or the control group. Infectious diseases physician was responsible for antibiotic authorization. The data on clinical outcomes, antibiotic consumption and antibiotic

expenditures of the patients in both groups were compared.

### Results

The target antibiotics were prescribed to 486 patients (516 prescriptions) in the control group and 462 patients (512 prescriptions) in the preauthorization group. The patients allocated to the preauthorization group had more favorable clinical outcomes (68.9% vs. 60.5%,  $p < 0.01$ ), shorter duration of target antibiotics (7.5 d. vs. 9.3 d.,  $p < 0.01$ ), shorter duration of all antibiotics (12.7 d. vs. 16.4 d.,  $p < 0.01$ ) and less mortality due to infections (29.4% vs. 35.4%,  $p = 0.05$ ) than those in the control group. The costs of target antibiotics and all antibiotics in the preauthorization group were much less than those in the control group. The annual antibiotic cost savings from antibiotic preauthorization requirement would be 862,704 US\$.

### Conclusion

Antibiotic preauthorization is an effective strategy in reducing antibiotic consumption and antibiotic expenditures without compromising the patients' clinical outcomes.

# Epidemiology of Sepsis in Siriraj Hospital 2007

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## ABSTRACT

**Backgrounds:** Sepsis remains a major health burden throughout the world, and there is limited epidemiological report of sepsis in Thailand.

**Methods:** From February 1 to July 31, 2007, all hospitalized patients in medical wards at Siriraj Hospital with diagnosis of sepsis according to the American College of Chest Physicians/Society of Critical Care Medicine consensus conference definition were recruited in order to determine the demographics, type of infections and causative agents, the treatments, clinical courses and outcomes.

**Results:** Sepsis was observed in 201 (5.8%) of 3,451 hospitalized patients in medical wards. The mean age was 56.9 years and 63.2 percent were females. 62.2 percent of the infections were community-acquired. 88.6 percent of the patients had underlying diseases. Bacteremia was identified in 40.8 percent of patients and GU tract infection was the most common source

(26.8%). Gram-negative bacteria were found in 51.7 percent. Septic shock developed in 38.8 percent of sepsis patients. Appropriate antibiotics were given to 59.2 percent of the patients, and only 66.5 percent of them received antibiotics within 6 hours of sepsis onset. Corticosteroid and vasoactive agent was given to 56.4 percent and 87.2 percent of the septic shock patients, respectively. Goal directed therapy was achieved in only 11.5 percent. The mortality among sepsis and septic shock patients was 34.3 percent and 52.6 percent, respectively ( $p=0.008$ ). Risk factors for hospital mortality included higher maximum SOFA score, hospital-acquired infection, central nervous system dysfunction and receiving antibiotics after 6 hours of onset of sepsis.

**Conclusion:** Sepsis is common among hospitalized medical patients and a mortality rate is still high. Goal directed therapy and appropriate antibiotics given within 6 hours might improve the outcomes and should be emphasized.

# Factors Influencing Outcomes of Treatment of Multidrug-resistant *Acinetobacter* Bacteremia in Ramathibodi Hospital

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## ABSTRACT

**Background:** Multidrug-resistant (MDR) *Acinetobacter baumannii* infection is an emerging problem that cause high mortality rate in patients who acquired this infection. This study aimed to identify factors affecting outcome of MDR including type of antibiotics and appropriateness of antibiotics.

**Methods:** A retrospective study was conducted among patients who had *Acinetobacter baumannii* bacteremia between April 2002 and April 2007. Clinical data, laboratory data, treatment and outcome of patients were reviewed.

**Results:** There were 96 patients included in this study. Baseline characteristics between patients who died within 3 days and who survived were similar. Univariate analysis suggested that the following factors may be related to a poor outcome: stroke, chemotherapy, low blood pressure, high respiratory rate, shorter duration of time from admission to fever and to positive culture)

all,  $P < 0.05$ ), and a trend toward inappropriate empirical treatment ( $P = 0.099$ ). Multivariate analysis found that time from admission to fever ( $OR = 0.967$ ; 95%CI: 0.939-0.997;  $P = 0.032$ ), receipt of chemotherapy ( $OR = 3.787$ ; 95%CI: 1.157-12.393;  $P = 0.028$ ), and low blood pressure ( $OR = 0.819$  per 10 mmHg increment; 95%CI: 0.684-0.979;  $P = 0.028$ ) were independently associated with mortality within 3 days. Antibiotics expected to be active against this bacterium such as carbapenems, cefoperazone/salbactam, and aminoglycosides showed no beneficial effect in empirical treatment of *A. baumannii*. Appropriate antibiotic may be associated with a better outcome although not statistically significant in multivariate analysis ( $OR = 0.653$ ; 95%CI: 0.226-1.887;  $P = 0.431$ ).

**Conclusion:** MDR *Acinetobacter* bacteremia causes high mortality partly due to difficulty in selecting appropriate initial treatment and these patients were generally sick with co-morbidities.

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# Early Diagnosis of Dengue Infection Using Saliva, Buccal Brush, and Urine During Febrile Stage by RT-PCR, to Avoid Diagnostic Venipuncture

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**Background:** Dengue is the most wide-spread mosquito-borne disease worldwide. Serologic diagnosis is often made retrospectively upon clinical recovery. Our group has demonstrated the value of late febrile and early post febrile urine and oral specimens in dengue virologic and serologic diagnosis. In this study, we sought to determine clinical utility of reverse transcription-polymerase chain reaction (RT-PCR) using early febrile in non-blood specimens for virologic diagnosis of dengue infection.

**Methods:** Adults with 3 days of acute febrile illness or less than and no obvious organ-specific symptoms, during June 2006 to October 2007 were enrolled prospectively for clinical data. Urine saliva and buccal brush were collected and tested by dengue-specific RT nested PCR with primers targeting conserved regions of the 3' untranslated region of the virus. Where available, 3 consecutive specimens on the febrile 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> day or after ended fever were tested. Diagnosis of dengue infection was based on positive

standard ELISA assay on paired serum/plasma specimens. Those with negative dengue ELISA test served as a control group.

**Results:** Of over 50 enrolled patients, 44 were eligible for analysis. Secondary dengue infection was diagnosed in 24 patients and primary dengue infection in 1 patient, leaving the other 19 as negative controls. The virus was detected in non-blood specimens about one-third of the patients. With two non-blood specimens combination, more than 65 percent of the patients were detected. Particularly in subgroup analysis (adults group), urine and/or buccal brush yield was up to 86 percent sensitivity. Specificity, PPV, NPV and accuracy were 100 percent, 100 percent, 86.7 percent and 92.6 percent, respectively.

**Conclusion:** This is the first study demonstrating utility of both blood and non-blood specimens for early dengue virologic diagnosis. Even though this is a pilot study, the results are promising. We are further performing the study in more patients.

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# Impact of Viral Hepatitis Co-infection on antiretroviral treatment Outcomes in HIV-infected Patients at Chiang Mai University Hospital

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## ABSTRACT

**Objective:** To study the impact of viral hepatitis co-infection on outcomes of antiretroviral treatment in HIV-infected patients.

**Methods:** This is a retrospective cohort study in 545 HIV-Infected patients who were receiving antiretroviral treatment at Chiang Mai University Hospital from 1 January 2001 to 31 March 2008. All patients were tested for hepatitis B virus (HBV) and hepatitis C virus (HCV) co-infections. We collected the data of baseline characteristics, baseline laboratory findings, CD4+ lymphocyte counts before initiation of antiretroviral therapy and every 6 months thereafter, HIV RNA measurement every 6 months, and liver function tests every 6 months. We compare the outcomes, i.e., efficacy of antiretroviral treatment and occurrence of liver dysfunction, between patients with and without hepatitis co-infection.

**Results:** Among 545 HIV-infected patients, the mean age was 40.66  $\pm$  8.66 years; 42.9 percent were male and 57.1 percent were female. 99.4 percent of patients were in CDC category C and 49.7 percent had received prior ARV treatment. Prevalence of HBV and HCV co-infections was 9.2 percent and 11.7 percent,

respectively. Median CD4+ lymphocyte counts at baseline were 70, 50, and 34  $\times 10^6$  cells/L for HIV, HIV-HBV, and HIV-HCV groups, respectively ( $P>0.05$ ). Mean duration of antiretroviral treatment were 51.27, 52.94, and 49.23 months for HIV, HIV-HBV, and HIV-HCV groups, respectively ( $P>0.05$ ). Male was predominant in HIV-HBV co-infection group compared with the other groups ( $P<0.01$ ). Changes of CD4+ lymphocyte counts over time in HIV, HIV-HBV co-infection and HIV-HCV co-infection were not significantly different ( $P>0.05$ ). There was no significant difference in rates of HIV viral suppression among HIV, HIV-HBV co-infection and HIV-HCV co-infection ( $P>0.05$ ). Patients with HIV-HCV co-infection had significantly more severe hepatitis than other groups ( $P<0.0001$ ).

**Conclusion:** This study could not demonstrate the difference in efficacy of ARV treatment between HIV-infected patients with and without viral hepatitis co-infection in terms of increase of CD4+ lymphocyte counts and rate of HIV viral suppression. However, in patients with HIV-HCV co-infection, severe hepatitis occurred more frequently than those without viral hepatitis co-infection.