



UNIVERSITI TEKNOLOGI MARA

**PREVALENCE OF ESBL-PRODUCING KLEBSIELLA
PNEUMONIAE AND ESCHERICHIA COLI AT
HOSPITAL TUANKU JA'AFAR SEREMBAN (HTJS)**

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ABSTRACT

PREVALENCE OF ESBL-PRODUCING *KLEBSIELLA PNEUMONIAE* AND *ESCHERICHIA COLI* AT HOSPITAL TUANKU JA'AFAR SEREMBAN (HTJS)

Objectives. The aims of the present study were to estimate the prevalence of Extended-Spectrum Beta-Lactamase (ESBL)-producing *Klebsiella pneumoniae* and *Escherichia coli* in Hospital Tuanku Ja'afar Seremban from April to August.

Methods. This present study was a cross-sectional study. Total of 452 cases of *Klebsiella pneumoniae* and *Escherichia coli* reported were collected for analysis of ESBL production. The cases were taken randomly within April to August 2014 to fulfill minimum 50 cases. All cases were taken from demographic data from Department of Microbiology at Hospital Tuanku Ja'afar Seremban.

Results. From 452 cases of *Klebsiella pneumoniae* and *Escherichia coli* recorded, 196 cases were *Klebsiella pneumoniae* and 256 were *Escherichia coli*. Out of 196 cases for *Klebsiella pneumoniae*, only 91 of them were ESBL cases and 73 cases of ESBL for *Escherichia coli* out of 256 isolates. Male patients are most common being infected by ESBL-producing *Klebsiella pneumoniae* and *Escherichia coli* with 59.1% compared to female patients, 40.9%. The most common age groups which were infected by ESBL-producing *Klebsiella pneumoniae* and *Escherichia coli* was age ranging from 30's to 45's with 27.4% while the least age group infected by this organisms were 45's to 60's with 14.0%. Pattern of antibiotic resistances showed that ESBL-producing bacteria resist towards ampicillin (AMP) and most of them show resistances towards cefuroxime (CXM), cefotaxime (CTX) and ceftazidime (CAZ).

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TABLE OF CONTENTS

Chapter	Content	Page
	TITLE PAGE	i
	DECLARATION	ii
	APPROVAL	iii
	ABSTRACT	iv
	ACKNOWLEDGEMENT	viii
	TABLE OF CONTENTS	ix
	LIST OF TABLES	xii
	LIST OF FIGURES	xiii
	ABBREVIATIONS	xiv
1.0	INTRODUCTION	
1.1	Background of the study	1
1.2	Problem statement	3
1.3	Objective	3
1.3.1	General objective	3
1.3.2	Specific objective	3
1.4	Significance of the study	4
1.5	Research hypothesis	4

CHAPTER I

1.0 INTRODUCTION

1.1 Background of the Study

Some bacteria will produce enzymes named beta-lactamases. Beta-lactamases are responsible for their resistance to beta-lactam antibiotics such as penicilins, cephamycins and carbapenems. All these antibiotics have a common element in their molecular structure which a four-atom ring known as a beta-lactam. The four-atom ring may be broke open by the lactamase thus deactivating the molecule's antibacterial properties.

In an article entitled Extended Spectrum Beta-Lactamases (ESBL's) – *Escherichia coli* (E.coli) and *Klebsiella* (n.d.) by Healthcare NHS Trust, ESBL is defined as an enzyme produced by bacteria such as *Escherichia coli* (E.coli) and *Klebsiella* sp. However, Matthew E.F. (n.d.) stated that bacteria which produce this chemical are commonly Gram-negative bacteria such as Enterobacteriaceae and non-fermentative Gram-negative bacteria. Enterobacteriaceae spp. which produce ESBL are *Escherichia coli*, *Klebsiella pneumonia*, *Klebsiella oxytoca*, *Proteus mirabilis*, *Enterobacter* sp. and *Salmonella* sp. while non-fermentative Gram-negative bacteria are *Acinetobacter baumannii* and *Pseudomonas aeruginosa*. These bacteria may break down several types of antibiotics making a person with infection of ESBL bacteria harder to treat (Extended-Spectrum Beta-Lactamase – Producing Bacteria, 2013).