PHARMACOEPIDEMIOLOGY OF UTILIZATION OF ANTIMICROBIALS AND NON STEROIDAL ANTI-INFLAMMATORY DRUGS IN NEW KASR AL AINI TEACHING HOSPITAL

Thesis
Submitted for the Fulfillment of MSc Degree in Pharmacology

Presented by

Bassant Morsy Sayed

M.B.B.Ch.
MSc in Dermatology
Demonstrator of Pharmacology
Faculty of Medicine, Cairo University

Supervised by

Prof. Dr. Abdel Rahman M. El Naggar

Professor of Pharmacology

Director of National Toxicological Center (NECTR)

Faculty of Medicine

Cairo University

Prof. Dr. Maissa Mohamed Shawky

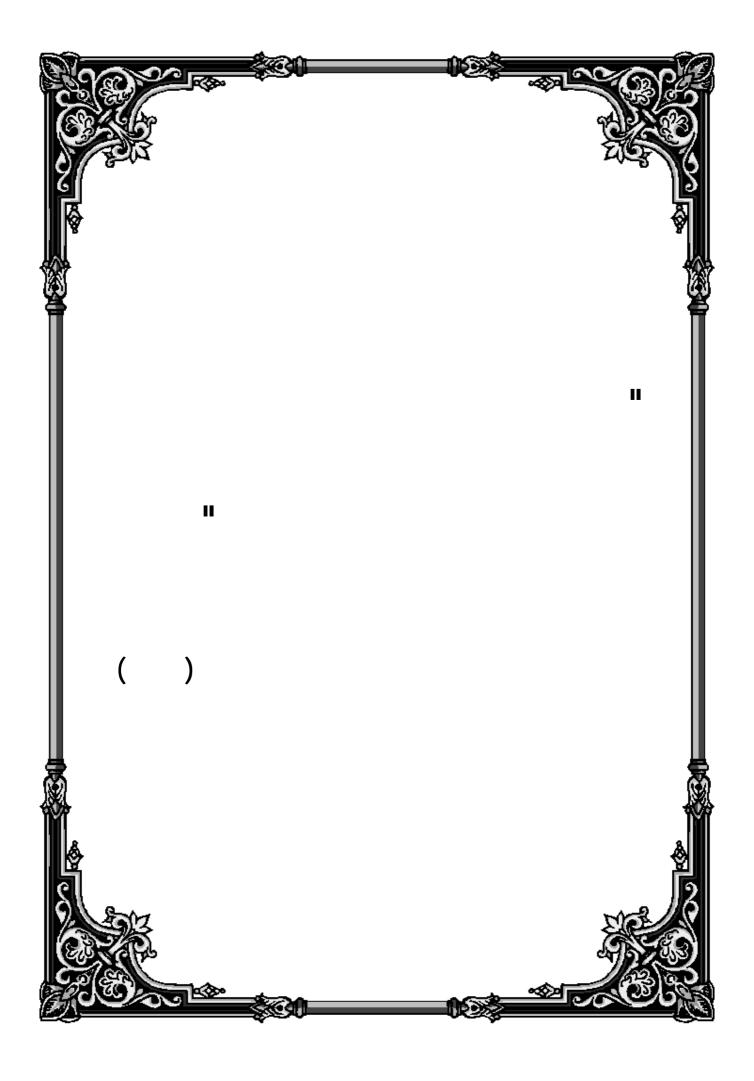
Professor of Public Health
Faculty of Medicine
Cairo University

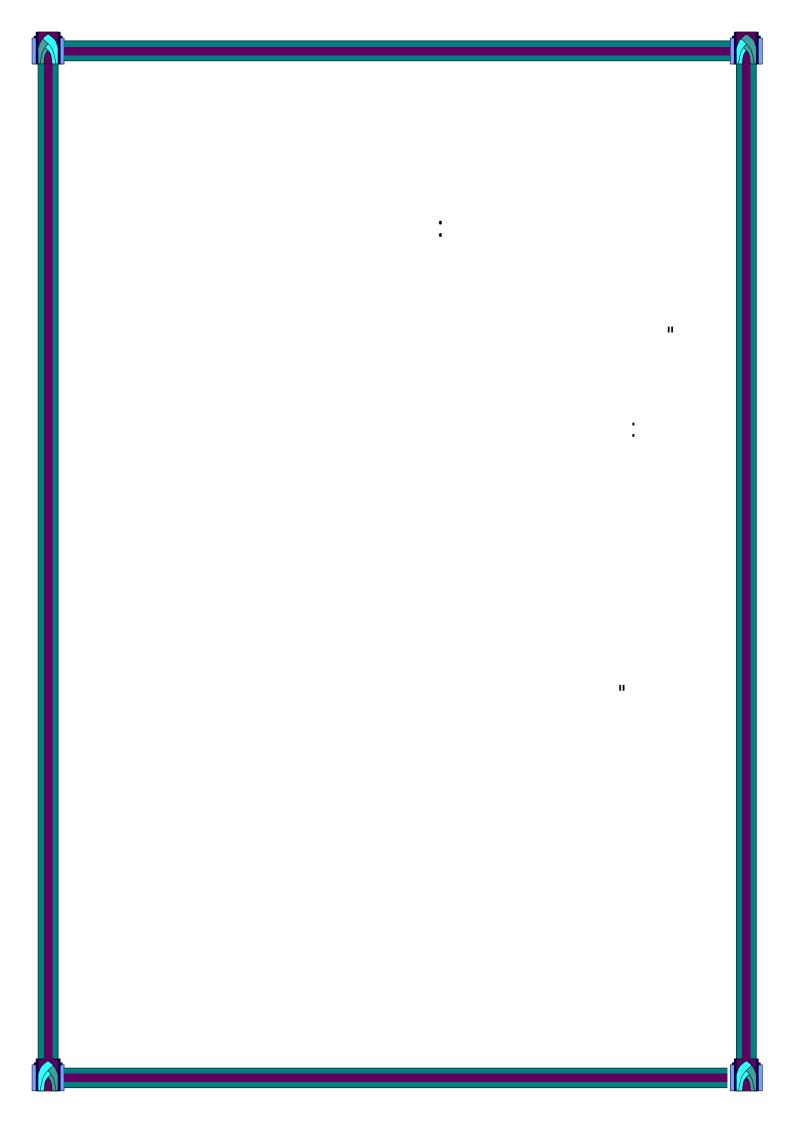
Dr. Ahmed Abd AL Rahman Ahmed

Lecturer of Pharmacology
Faculty of Medicine
Cairo University

Faculty of Medicine Cairo University 2009

الباحث كلية الطب جامعة القاهرة





ABSTRACT

Pharmacoepidemiology is the study of the utilization and effects of drugs in large numbers of people. Drug utilization research is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure. Over time the distinction between these two terms has become less sharp and they are sometimes used interchangeably. This study was conducted in NEW KASR AL AINI TEACHING HOSPITAL. It is a descriptive retrospective study, applied on 1000 electronic medical records for patients had taken systemic antimicrobial and / or systemic non-steroidal anti-inflammatory drugs. in 2008. It was revealed that 894 (89.4%) of patients had antibiotic prescriptions. Cephalosporins showed the highest rate (73.8%) of prescriptions of total antibiotics prescribed patients followed by penicillins (29.7%) then Quinolones & sulpha group (20%) and aminoglycosides (15.8%). Regarding other systemic antimicrobials in this study, they represented about one quarter (25.4%) of the studied sample. It was found that metronidazole alone was significantly higher prescribed antimicrobials. Patients who had NSAIDs (84.6%) than other prescriptions represented (77.4%) of the studied sample. It was found that paracetamol was the most commonly prescribed NSAIDs (54.3%) of NSAIDs prescribed patients, this is followed by acetic acid derivatives group (35.4%) then salicylates &indoles almost equal percentage of usage (26.5% & 26.1% respectively).

Key Words: Pharmacoepidemiology- Drug utilization researchanti- microbials- Non steroidal anti-inflammatory drugs

Table of Contents

	Page
List of abbreviations	I
List of tables	IV
List of figures	VII
Introduction	1
Aim of Work	4
Review of literature:	
Pharmacoepidemiology	5
Drug utilization studies Abroad	26
Drug utilization studies in Egypt	32
Materials and Methods	39
Results	47
Discussion	134
Summary and Conclusions	158
Recommendations	162
References	164

List of abbreviations

ABP Anti-bio-Prophylaxis Policy

ADRs Adverse Drug Reactions

ALT Alanine Transaminase

AMAs Antimicrobial Agents

ASPs Antimicrobial Stewardship Programs

AST Aspartate Transaminase

ATC Anatomical Therapeutic Chemical Classification.

BA Bronchial Asthma

BNF British National Formulary

CBC Complete Blood Count

CCU Coronary Care Unit

CIA Central Intelligence Agency

CLD Chronic Liver Disease

CPE Continuous Professional Education

CNS Central Nervous System

CVS Cardio-Vascular System

DM Diabetus Mellitus

DDD Defined Daily Doses

DTC Drug and Therapeutic Committees

DUR Drug Utilization Review

DURG Drug Utilization Research Group

DU90% Drug utilization for 90% of the use

ESAC European Surveillance of antimicrobial consumption

EMBASE Excerpta Medica database

ESBLs Extended Spectrum Beta-Lactamases

FDA Food and Drug Administration

GAHI General Association of Health Insurance

GOTHI General Organization for Teaching Hospitals and

Institutes

GPs general practitioners

GPRD General Practice Research Database

GIT Gastrointestinal Tract

HCV Hepatitis C Virus

HIO Health Insurance Organization

IAAAS International Agranulocytosis and Aplastic Anemia

Study

ICPs Infection Control Programs

ICU Intensive Care Unit

JCAHO Joint Commission on Accreditation of Healthcare

Organizations

KHMC King Hussein Medical Center

LPA Las Palmas

LOS Length Of Stay

MOH Ministry Of Health

NGO Non Governmental Organizations

NICC Nosocomial Infection Control Center

NSAIDs Non Steroidal Anti-inflammatory Drugs

OTC Over The Counter

PDD Prescribed Daily Dose

PHC Primary Health Care

RBCs Red Blood Cells

RT Respiratory Tract

SPSS Statistical Package of Social Sciences.

SSI Surgical Suture Infection

TEMPUS Trans-European Mobility Scheme for University

Studies.

UK United Kingdom

USA United States of America

WB West Bank

WBCs White Blood Cells

WHO World Health Organization

LIST OF TABLES

	Page
Table (A): The structure of the ATC coding system for ciprofloxacin	24
Table (1): Age distribution of the studied patients	49
Table (2): Sex distribution of the studied patients	50
Table (3): Sex distribution in different age groups	51
Table (4): Distribution of the studied patients according to LOS	52
Table (5): LOS in relation to age groups	53
Table (6): Distribution of diagnosis in relation to age groups	54
Table (7): Distribution of co-morbidities in relation to age groups	58
Table (8): Antibiotic consumption of the studied patients	59
Table (9): Antibiotic consumption in pediatrics & adolescents	61
Table (10): Antibiotic consumption in adults	63
Table (11): Antibiotic consumption in geriatrics	65
Table (12): Number of antibiotics taken in relation to age groups	67
Table (13): Number of antibiotics taken in relation to LOS	69
Table (14): Distribution of penicillins in relation to age groups	71
Table (15): Distribution of penicillin types in relation to age groups	73
Table (16): Distribution of cephalosporin generations in relation to age groups	75
Table (17): Distribution of cephalosporins in relation to age groups	77
Table (18): Distribution of other β -lactam antibiotics in relation to age groups	79
Table (19): Distribution of quinolones in relation to age groups	81

Table (20): Distribution of Aminoglycosides in relation to age groups	83
Table (21): Distribution of macrolides in relation to age groups	85
Table (22): Distribution of clindamycin in relation to age groups	87
Table (23): Distribution of vancomycin in relation to age groups	89
Table (24): Distribution of amoxycillin + clavulanic acid in relation to age groups	91
Table (25): Distribution of ampicillin+ sulbactam in relation to age groups	93
Table (26): Distribution of ampicillin+ cloxacillin in relation to age groups	95
Table (27): Distribution of amoxycillin + flucloxacillin in relation to age groups	96
Table (28): Distribution of piperacillin+ tazobactam in relation to age groups	98
Table (29): Distribution of cefoperazone+ sulbactam in relation to age groups	99
Table (30): Distribution of imipenem+ cilastatin in relation to age groups	101
Table (31): Distribution of sulphamethoxazole+ trimethoprim in relation to age groups	103
Table (32): Distribution of other antimicrobials in relation to age groups	105
8	
Table (33): NSAIDs consumption of the studied patients	107
	107 109
Table (33): NSAIDs consumption of the studied patients	
Table (33): NSAIDs consumption of the studied patients Table (34): NSAIDs consumption in pediatrics & adolescents	109
Table (33): NSAIDs consumption of the studied patients Table (34): NSAIDs consumption in pediatrics & adolescents Table (35): NSAIDs consumption in adults	109 111

Table (38): Number of NSAIDs taken in relation to LOS	117
Table (39): Distribution of paracetamol in relation to age groups	119
Table (40): Distribution of salicylates in relation to age groups	121
Table (41): Distribution of indoles in relation to age groups	123
Table (42): Distribution of acetic acid derivatives in relation to age groups	125
Table (43): Distribution of oxicams in relation to age groups	127
Table (44): Distribution of propionic acid derivatives in relation to age groups	129
Table (45): Distribution of Cox-2 inhibitors in relation to age groups.	130
Table (46): Co-administered drugs of the studied patients	131
Table (47): Results of investigations of the studied patients	133

List of Figures

	Page
Figure (A): Record linkage in administrative health databases	15
Figure (B): Total consumption and sales of anti-microbials in New Kasr El-Aini Teaching Hospital (2002)(1, 2)	33
Figure (B): Total consumption and sales of anti-microbials in New Kasr El-Aini Teaching Hospital (2002)(3, 4)	34
Figure (C): Utilization of antibiotics in Ahmed Maher hospital Jan-Mar 2007	37
Figure (1): Age distribution of the studied patients	49
Figure (2): Sex distribution of the studied patients	50
Figure (3): Sex distribution in different age groups of the studied patients	51
Figure (4): Distribution of the studied patients according to LOS	52
Figure (5): LOS in relation to age groups	53
Figure (6-A): Distribution of diagnosis of the studied patients	56
Figure (6-B): Distribution of diagnosis in relation to age groups	57
Figure (7): Antibiotic consumption of the studied patients	60
Figure (8): Antibiotic consumption in pediatrics & adolescents	62
Figure (9): Antibiotic consumption in adults	64
Figure (10): Antibiotic consumption in geriatrics	66
Figure (11): Number of antibiotics taken in relation to age groups	68
Figure (12): Number of antibiotics taken in relation to LOS	70
Figure (13): Distribution of penicillins in relation to age groups	72
Figure (14): Distribution of penicillin types in relation to age groups	74
Figure (15): Distribution of cephalosporin generations in relation to age groups	76

Figure (16): Distribution of cephalosporins in relation to age groups	78
Figure (17): Distribution of other β -lactam antibiotics in relation to age groups	80
Figure (18): Distribution of quinolones in relation to age groups	82
Figure (19): Distribution of Aminoglycosides in relation to age groups	84
Figure (20): Distribution of macrolides in relation to age groups	86
Figure (21): Distribution of clindamycin in relation to age groups	88
Figure (22): Distribution of vancomycin in relation to age groups	90
Figure (23): Distribution of amoxycillin + clavulinic acid in relation to age groups	92
Figure (24): Distribution of ampicillin+ sulbactam in relation to age groups	94
Figure (25): Distribution of ampicillin+ cloxacillin in relation to age groups	95
Figure (26): Distribution of amoxicillin + flucloxacillin in relation to age groups	97
Figure (27): Distribution of piperacillin+ tazobactam in relation to age groups	98
Figure (28): Distribution of cefoperazone+ sulbactam in relation to age groups	100
Figure (29): Distribution of imipenem+ cilastatin in relation to age groups	102
Figure (30): Distribution of sulphamethoxazole+ trimethoprim in relation to age groups	104
Figure (31): Distribution of other antimicrobials in relation to age groups	106
Figure (32): NSAIDs consumption of the studied patients	108
Figure (33): NSAIDs consumption in pediatrics & adolescents	110

Figure (34): NSAIDs consumption in adults	112
Figure (35): NSAIDs consumption in geriatrics	114
Figure (36): Number of NSAIDs taken in relation to age groups	116
Figure (37): Number of NSAIDs taken in relation to LOS	118
Figure (38): Distribution of paracetamol in relation to age groups	120
Figure (39): Distribution of salicylates in relation to age groups	122
Figure (40): Distribution of indoles in relation to age groups	124
Figure (41): Distribution of acetic acid derivatives in relation to age groups	126
Figure (42): Distribution of oxicams in relation to age groups	128
Figure (43): Distribution of propionic acid derivatives in relation to age groups	129
Figure (44): Distribution of Cox-2 inhibitors in relation to age groups	130
Figure (45): Co-administered drugs of the studied patients	131