STREPTOCOCCUS PNEUMONIAE IN COMMUNITY ACQUIRED PNEUMONIA IN INFANTS AND CHILDREN LESS THAN FIVE YEARS OLD

Thesis

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List of Abbreviations

μL:	Microliter
AAP:	American Academy of Pediatrics
ACIP:	Advisory Committee for Immunization Practices
ADH:	Antidiuretic hormone
AOM:	Acute otitis media
BAL:	Bronchoalveolar lavage
C. pnemoniae:	Chlamydia pneumoniae
CAP:	Community acquired pneumonia
CBC:	Complete blood count
CbpA:	Choline binding protein A
CDC:	Centers for Disease Control and Prevention
CHD:	Congenital heart disease
CNS:	Central nervous system
CRP:	C-reactive protein
CSF:	Cerebro-spinal fluid
CT:	Computed tomograpahy
CXR:	Chest x-ray
DNA:	Deoxyribonucleic acid
E.coli:	Escherichia coli
ET:	Endotracheal
FiO_2:	Fraction of inspired oxygen
GERD:	Gastro-oesophageal reflux disease
H. influenzae:	Haemophilus influenzae
Hib:	Haemophilus influenzae type b
Ib:	Pound
ICU:	Intensive care unit
IgA:	Immunoglobulin A
IgG:	Immunoglobulin G
IgM:	Immunoglobulin M

IL:	Interleukin
IL-1:	Interleukin 1
IM:	Intramuscular
IV:	Intravenous
Kg:	Kilogram
L:	Liter
M. pnemoniae:	Mycoplasma pnemoniae
mg:	milligram
MRSA:	Mecithillin resistant Staphylococcus aureus
^{o}C:	Degree centigrade (celcius)
$PaCO_2$:	Pressure of arterial carbon dioxide
PAF:	Platelet activating factor
PCAP:	Pediatric community acquired pneumonia
PCR:	Polymerase chain reaction
PSPA:	Pneumonococcal surface protein A
RSV:	Respiratory syncytial virus
S. pneumoniae:	Streptococcus pneumoniae
SaO_2:	Arterial oxygen saturation
SP:	Streptococcus pneumoniae
SPSS:	Statistical package of social science
TLC:	Total leucocytic count
UK:	United Kingdom
US:	United States
USA:	United States of America
WBC:	White blood cell
WHO:	World Health Organization

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Introduction

The term "community-acquired pneumonia" (CAP) refers to a pneumonia in a previously healthy person who acquired the infection outside a hospital. CAP is one of the most common serious infections in children, with an incidence of 34 to 40 cases per 1000 children in Europe and North America ***(Jokinen, et al., 1993 and British Thoracic Society Standards of Care Committee, 2002)***. It is to be mentioned that lower respiratory tract infection is one of the leading causes of childhood mortality in developing countries ***(Redd et al., 1994 and Boschi-Pinto and Debay, 2004)***.

Many studies were carried out to delineate the most common causative organisms in bacterial pneumonias among pediatric age groups. Streptococcus pneumoniae (SP) is the most common bacterial cause of CAP after the neonatal period ***(Principi and Esposito, 2002)***.

Streptococcus pneumoniae is a gram positive, lancet-shaped, encapsulated diplococcus, occurring occasionally as individual cocci or in chains. Ninety serotypes have been identified by type-specific capsular polysaccharides. Streptococcus pneumoniae, or pneumococcus, frequently colonizes the upper respiratory tract and may cause upper respiratory tract infection (e.g., otitis media, sinusitis) or invasive disease (e.g., pneumonia, bacteremia, meningitis). Streptococcus pneumoniae is the most common cause of

bacterial community-acquired pneumonia and otitis media and the second most common cause of meningitis in children ***(Behrman et al., 2004a)***.

In February 2000, a new heptavalent pneumococcal vaccine was licensed for use in the United States. This vaccine produces immunity for the seven most common disease-producing serotypes of Streptococcus pneumoniae in children. Widespread use of this vaccine is expected to decrease incidence of invasive pneumococcal disease dramatically ***(Black et al., 2000 and McIntosh, 2002)***.

Recent data from ongoing meningitis surveillance in Egypt revealed that 47% of Streptococcus pneumoniae strains from cerebro-spinal fluid were non-conjugate vaccine serotypes ***(Abdel-Maksoud et al., 2004)***. Minimal data currently exist on the proportion of community-acquired pneumonia caused by Streptococcus Pneumoniae, and on the distribution of various serotypes of Streptococcus pneumoniae in the Middle East.

Aim of the Work

The aim of the present work is to study the magnitude of Streptococcus pneumoniae infections in the problem of community-acquired pneumonia among infants and children below the age of 5 years, to describe the clinical characteristics of Streptococcus pneumoniae infection in this age group and to identify the distribution of various serotypes of Streptococcus pneumoniae in Egypt.

Community Acquired Pneumonia

Definition:

The term "community-acquired pneumonia" (CAP) refers to a pneumonia in a previously healthy person who acquired the infection outside a hospital ***(Jokinen et al., 1993 and British Thoracic Society Standards of Care Committee, 2002)***.

Incidence and mortality:

CAP is one of the most common serious infections in children, with an incidence of 34 to 40 cases per 1,000 children in Europe and North America ***(British Thoracic Society Standards of Care Committee, 2002; Gaston, 2002 and McIntosh, 2002)***, which is a higher rate than at any other time in life apart from populations aged 75 years and over ***(McIntosh, 2002).*** Although death from CAP is rare in industrialized countries, lower respiratory tract infection is one of the leading causes of childhood mortality in developing countries ***(Redd et al., 1994; Baltimore, 2002a and Boschi-Pinto and Debay, 2004)***.

Etiology:

Determining the cause of pneumonia in a child is often difficult; the lung itself is rarely sampled directly, and sputum representing lower-airway secretions can rarely be obtained from children. In addition, culture of secretions from the upper respiratory tract is not useful, since the normal flora includes